ARCHAEOLOGICAL INVESTIGATIONS AT STAFFORD STREET, NEWPORT, SHROPSHIRE

Jo Wainwright and Adam Lee

With contributions by Elizabeth Pearson, Nick Daffern and Dennis Williams

Illustrations by Carolyn Hunt

1st June 2010

Revision 1

Historic Environment and Archaeology Service,
Worcestershire County Council,
Woodbury,
University of Worcester,
Henwick Grove,
Worcester WR2 6AJ

Project 3493
Report 1761

Contents

Archaeological investigations at Stafford Street, Newport, Shropshire

Jo Wainwright and Adam Lee

With contributions by Elizabeth Pearson and Dennis Williams

Part 1 Project summary

An archaeological evaluation and watching brief was undertaken at a site off Stafford Street, Newport, Shropshire (centred on NGR SJ 7470 1917). It was undertaken on behalf of CgMs Consulting Ltd for their clients McCarthy and Stone (developments) Ltd who intend to develop the site as retirement flats for which a planning application has been submitted.

The project aimed to determine if any significant archaeological site was present and if so to indicate what its location, date and nature were.

Five evaluation trenches were excavated. The watching brief element comprised the monitoring of the lifting of a concrete slab and tarmac and the removal of retaining walls. The excavation of five geo-technical test pits was also monitored along with the removal of a vehicle inspection pit and two buried fuel tanks after decommissioning.

In the northern part of the site a marshy area/pond was identified. This was clearly water filled during the medieval period as the upper part contained medieval pottery dated from the 13th to early 14th century. A possible revetment along the edge of this feature was identified. The lower parts of these peaty deposits, although as yet undated, are conjectured to predate the medieval period.

In the early post-medieval period and later this area was consolidated by the dumping of material.

A cultivation soil seen in some of the trenches dates from the post-medieval period and probably corresponds to the orchard and gardens shown on the Ordnance Survey 1882 map. In other trenches remains of structures which relate to buildings shown on later Ordnance Survey maps were identified. Brick rubble seen in some of the trenches probably relates to the demolition of these buildings.

Environmental sampling of the deposits in the northern part of the site was carried out which has provided information on the progression of this environment from a marsh or pond to a drier area of woodland or scrub. It is clear that the organic deposits revealed have the potential to provide information on the changing environment and possibly craft and industrial activities carried out in the vicinity during the medieval and post-medieval periods. Their significance can be set within the context of information available on organic deposits known to exist in Newport and further afield in the wetlands of northern Shropshire and Staffordshire.

Part 2 Detailed report

1. Background

1.1 Reasons for the project

Archaeological investigations were undertaken at Stafford Street (centred on NGR SJ 7470 1917), Newport, Shropshire (Fig 1), on behalf of CgMs Consulting Ltd, for their clients McCarthy and Stone (developments) Ltd. The intended development consists of retirement flats for which a planning application has been submitted to Shropshire County Council (reference W2009/0615), who consider that archaeological remains or activities dating from the medieval period may be affected.

1.2 Project parameters

The project conforms to the *Standard and guidance for archaeological field evaluation* (IfA 2008a) and *Standard and guidance for an archaeological watching brief* (IfA 2008b).

The project also conforms to a brief prepared by CgMs Consulting Ltd (Patrick 2010) and for which a project proposal (including detailed specification) was produced (HEAS 2010).

1.3 Aims

The aims of the project were to locate archaeological deposits and determine, if present, their extent, state of preservation, date, type, vulnerability and documentation. The purpose of this was to establish their significance, since this would make it possible to recommend an appropriate treatment which may then be integrated with the proposed development programme.

The archaeological background to the site is given in the desk-based assessment previously prepared by the Client (Patrick 2004).

The desk-based assessment indicated that significant deposits may be defined as those likely to be of medieval and post-medieval date.

In particular the project had the following aims:

- the identification of rear burgage plot activity, including domestic and industrial, behind the High Street, possibly associated with Smithfield Cattle Market to the north-west, tanning and iron working

2. Methods

2.1 Documentary research

A desk-based assessment was produced by the Client (Patrick 2004).

2.2 Fieldwork methodology

2.2.1 Fieldwork strategy

A detailed specification has been prepared by the Service (HEAS 2010). Fieldwork was undertaken between 22 March 2010 and 12 April 2010.

A watching brief was carried out on the lifting of the concrete slab and tarmac, the excavation of five geo-technical test pits and the removal of retaining walls. Monitoring of the removal of a vehicle inspection pit and two buried fuel tanks after decommissioning was also carried out.

Five evaluation trenches, amounting to just over 166m² in area, were excavated over the site area of 0.32ha, representing a sample of approximately 5%. Trenches 1 and 3 were extended, and stepped out to retrieve further environmental samples and therefore an extra *c* 25m² was

excavated, extending the sample to just over 5%. The location of the trenches is indicated in Figure 2.

Deposits considered not to be significant were removed under archaeological supervision using both a wheeled excavator and tracked excavator, employing a toothless bucket. Subsequent excavation was undertaken by hand. Clean surfaces were inspected and selected deposits were excavated to retrieve artefactual material and environmental samples, as well as to determine their nature. Deposits were recorded according to standard Service practice (CAS 1995). On completion of excavation, trenches were reinstated by replacing the excavated material.

2.2.2 Structural analysis

All fieldwork records were checked and cross-referenced. Analysis was effected through a combination of structural, artefactual and ecofactual evidence, allied to the information derived from other sources.

2.3 Artefact methodology, by Dennis Williams

2.3.1 Artefact recovery policy

The artefact recovery policy conformed to standard Service practice (CAS 1995; appendix 2). However, in this case only a sample of post medieval material was collected from later post medieval deposits. These comprised a good proportion of the finds recovered from the site. All artefacts were recovered from stratified deposits.

2.3.2 Method of analysis

All hand-retrieved finds were examined and a primary record made on a Microsoft Access 2000 database. They were identified, quantified and dated to period, and a *terminus post quem* date produced for each stratified context. These dates were used as a means of determining the broad chronology of the site.

The pottery and ceramic building materials were examined under ×20 magnification and recorded by fabric type according to the reference series maintained by the service (Hurst and Rees 1992; HEAS 2009).

2.4 Environmental archaeology methodology, by Elizabeth Pearson and Nick Daffern

2.4.1 Sampling policy

The environmental sampling strategy conformed to standard Service practice (CAS 1995, appendix 4). Large animal bone was hand-collected during excavation. A bulk sample (40 litres) was taken from the top of an organic deposit 106 revealed in Trench 1. During a subsequent visit an extension to Trench 1 was excavated (Fig 2) which revealed part of the organic deposit 106, and to the south, a further sequence of organic deposits which may be a pond or marshy area. A monolith was taken through 106, but it was not possible to record or sample the organic deposits to the south on account of their instability.

A dark peaty layer 303 was recorded at approximately 68.60m AOD in Trench 3 and was sampled from an extension to the trench (Fig 2) where it was visible as a thin a layer approximately 0.08m thick.

The top of 106 was dated to the medieval period by pottery, while the dark peaty layer 303 in Trench 3 is presently undated.

2.4.2 Method of analysis

Macrofossil Analysis

For each of the samples a sub-sample of 1 litre was processed by the wash-over technique as follows. The sub-sample was broken up in a bowl of water to separate the light organic remains from the mineral fraction and heavier residue. The water, with the light organic faction was decanted onto a 300mμ sieve and the residue washed through a 1mm sieve. The remainder of the bulk sample has been retained for further analysis.

From context 106, a sub-sample of 20 litres was processed by flotation using a Siraf tank. The flot was collected on a 300μm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were scanned by eye and the abundance of each category of environmental remains estimated. The flots were scanned using a low power MEIJI stereo light microscope and plant remains identified using modern reference collections maintained by the Service, and seed identification manual (Cappers *et al* 2006). Nomenclature for the plant remains follows the New Flora of the British Isles, 2nd edition (Stace 1997).

Pollen Analysis

In total, four pollen samples of $2cm^3$ were selected for analysis. Three were taken from the top, middle and base of monolith <4> and a single "spot" sample was taken from context (303). The samples were submitted to the laboratories of the Department of Geography & Environment at the University of Aberdeen for chemical preparation following standard procedures as described by Barber (1976) and Moore *et al* (1991). The full methodology is described in Appendix 3

Where preservation allowed, pollen grains were counted to a total of 150 land pollen grains (TLP) for assessment purposes using a GS binocular polarising microscope at x400 magnification, and identification was aided by using the pollen reference slide collection maintained by the Service, and the pollen reference manual by Moore *et al* (1991). Nomenclature for pollen follows Stace (2010) and Bennett (1994).

Fungal spores and parasite ova were noted with rapid identification being undertaken to genus level. Identifications were aided through reference material maintained by the Service and reference manuals Kirk et al (2008) and Grant-Smith (2000).

2.5 The methods in retrospect

The methods adopted allow a high degree of confidence that the aims of the project have been achieved.

Trench 1 was extended in order to retrieve further environmental samples from the area where deposit 106 was located and a monolith sample was successfully retrieved. Further organic layers close to deposit 106 were observed in the north-east side of the extension to Trench 1. These deposits appeared to be significant palaeoenvironmental deposits. Due to Health and Safety considerations, predominately due to the trenches collapsing sides, further samples were unable to be taken and the trench was backfilled.

3. Topographical and archaeological context

The archaeological and topographical background is given in the desk-based assessment (Patrick, 2004). In the light of the organic deposits uncovered during the project, the following information is also considered relevant.

The town of Newport is situated between two wetland areas identified in the *North West Wetlands Survey* (Leah *et al* 1998). The Weald Moors lie to the southwest of Newport and Aqualate Mere lies just to the northeast. The Weald Moors consist of an extensive area of shallow peats and organic soils which formed along the Strine Brook. The Strine Brook runs through Newport and the organic deposits found on site may have formed under similar conditions to that of The Weald Moors. The Aqualate Mere consists of a lake with peat deposits to the west and east. The organic deposits found on site may have formed part wetlands between the Strine Brook and the Aqualate Mere.

4. Results

4.1 Structural analysis

The trenches and features recorded are shown in Figures 2 and 3, Plates 1-4. The results of the structural analysis are presented in Appendix 1.

4.1.1 Phase 1 Natural deposits

The natural deposits over the whole of the site consisted of yellow and orange sands with occasional gravels.

4.1.2 Phase 2 Medieval deposits

Trench 1 (Fig 3)

A fill of a marshy area or pond 106 was identified in the trench (Plate 1). The natural sands 110 and 111 were seen at *c* 67.90m AOD in a sondage to test the depth of 106 which was about 0.90m thick. This deposit was mid grey brown in colour and was waterlogged. The matrix consisted of sandy silt with at least 30% organic material which included tree roots and other decayed organic material. Inclusions included occasional small to medium sub-rounded and rounded pebbles. Pottery recovered from the top of this deposit dates from the 13th to early 14th century. This feature was seen in the west end of the trench. An eastern edge was identified in the centre of the trench where the remains of a possible wooden revetment were located 113 (Plate 2). However, no clear edge to this feature could be defined as the marshy area/pond presumably changed in size over time and the edge had migrated with these changes. The possible wooden revetment consisted of several stakes/posts, 113. A further post 112 was identified further east which is presumably associated with this possible revetment. All of these posts/stakes were presumably driven in. An undated layer of re-deposited sands with occasional gravels 105 overlay the edge of 106 and could represent washed in deposits from flooding events dating from the medieval period.

Trench 3

In the north-western end of Trench 3 an organic waterlogged peaty layer 303 seen in a sondage at about 68.50m AOD and in the trench extension may be the southerly most extent of the organic deposits seen in the Trench 1 extension as it is similar to the basal peaty deposit (Plate 3).

Test pit 8

A layer of soft grey sandy clay silt 802, identified between 1.30-1.50m below ground surface and above natural 803, could be related to the organic deposits seen to the north in Trench 1. Perhaps this deposit represents the edge of the marshy area/pond.

Test pits 9 and 11

In both of these test pits waterlogged organic deposits which almost certainly relate to the organic deposits identified in Trenches 1 and 3 were observed. Deposit 904 was located 1.80-2.20m below ground surface and deposit 1102 was observed between 0.90-1.40m below ground surface. Above 904 was a clean sand and gravel layer 903.

4.1.3 Phase 3 Post-medieval deposits

Trench 1 (Fig 3)

Above marsh/pond deposit 106 and partially overlaying the re-deposited sands and gravels 105 was a mixed layer of predominantly sandy silt with lenses of burnt clay daub and post-medieval iron processing material 104. Another similar dump of material, although more mixed, was situated in the east of the trench 103. Sealing these dumps was a 0.80m cultivation/garden soil or build up of soil 102, late post-medieval in date. A clay lined well 108 cutting 102 and 106, in the west of the trench, was backfilled with brick rubble. Brick and sandstone footings 107, drains, and other structural features were seen cutting 102.

Above 102 was a brick and rubble demolition layer 101 which was sealed by the tarmac and hardcore of the modern surfaces 100.

Trench 2

Natural sands and gravels 202 were seen at *c* 69.50m OD. Cutting natural in the south-east of the trench and running roughly parallel with Stafford Street was a ditch, 0.75m wide, 204 (Fig 2 and Plate 4). The fill, 203 was a humic sandy silt and contained pottery dating from the late 19th to early 20th century. A very mixed layer 201 seen throughout the trench contained 19th and 20th century pottery. In the north-west of this trench there were several brick and sandstone footings, tile floors and other structural features cutting 201. A demolition layer 200, consisting mainly of brick rubble, was above 201.

Trench 3

Above the organic waterlogged deposit 303 was a layer of sands 302. A very disturbed and mixed layer 301 was above 302. Layer 301 contained pottery and ceramic building material (CBM) which was dated to 1700-1850. Above this and 302 in the south-west part of the trench was a dark black to brown sandy silt with inclusions of concrete and brick 300. This was beneath the modern ground surface of concrete which had been removed beforehand.

Trench 4

A former cultivation/garden soil layer 403, consisting of a brown sandy silt, was observed running the whole length of the trench and was above natural sand and gravel 407. Deposit 403 was dated to the post medieval period. A tree throw or possible ditch 405 was identified, the fill 404 of which was identical in nature to layer 403. The relationship between 405 and 403 was not established. Cutting through deposit 403 were two deposits of dumped material 402 and 406 containing post-medieval building material. Overlying deposit 402 and only seen in the west end of the trench a clinker deposit 401 was observed overlain by demolition rubble/make-up Layer 400.

Trench 5

In the south end of the trench a layer 501 of disturbed natural formed an interface between natural sand 504 and hardcore 500. Layer 501 was truncated by modern disturbance 503 and sealed by hardcore 500.

Trenches 6 and 7, Test pits 10 and 12

These trenches and test pits all revealed modern disturbed/makeup layers overlying natural sand and gravel deposits. No archaeological features or layers were identified.

Test pit 8

Above the layer of soft grey sandy clay silt 802 was a 0.60m thick make-up layer 801 which was below brick demolition 800.

Test pits 9 and 11

Above layers 903 and 1102 were mainly garden soil layers with disturbed deposits above these.

Trench 13

At the southwest end of the northwest facing section of the trench a post hole 1303 was identified cutting into natural sands and gravels 1304. The pottery recovered from the post hole was dated to the post-medieval period. Overlying 1303 was a grey brown sandy silt relic garden soil deposit 1301 which was in turn sealed by demolition rubble/make-up Layer 1300.

5. Artefact analysis, by Dennis Williams

The artefactual assemblage recovered is summarised in Tables 1 to 3.

5.1 The artefact assemblage

The assemblage recovered during the excavation is summarised in Table 1. The artefacts, which were mainly post-medieval, comprised pottery, tile, clay pipes, glass, coal, slag and

some undiagnostic fired clay. Two small pieces of bone were recorded, but not analysed in detail. Preservation conditions at the site were generally good.

Material class	Period	Count	Weight (g)
Bone	Undated	2	16
Ceramic	Medieval	3	36
Ceramic	Modern	2	2
Ceramic	Post-medieval	41	3182
Ceramic	Post-med/modern	2	54
Ceramic	Undated	3	212
Glass	Post-medieval	1	164
Mineral	Undated	1	8
Slag	Post-medieval	8	14
Totals:		63	3688

Table 1: Quantification of the assemblage

5.2 Pottery

Pottery sherds were grouped and quantified according to fabric type, as shown in Table 2. There were no diagnostic form sherds that could provide precise dating evidence, but most sherds were datable by fabric type to general production spans.

Period	Fabric code	Fabric common name	Count	Weight (g)
Medieval	99	Miscellaneous medieval wares	3	36
Post-medieval	78	Post-medieval red wares	5	142
Post-medieval	81.5	White salt-glazed stoneware	2	82
Post-medieval	91	Post-medieval buff wares	5	130
Post-medieval/ modern	85	China	2	2
Totals:			17	392

Table 2: Quantification of the pottery by period and fabric-type

Medieval

Three sherds, listed as fabric 99 in Table 2, were probably medieval. Two of these, from context 106, bore traces of pale green glaze, and had greyish-brown surfaces with grey reduced cores. It is possible that these were variants of glazed sandy white wares (fabric 64.2) that may have been produced in Staffordshire during the 13th to early 14th centuries. A sherd recovered from an unstratified part of the excavation had a very hard, mid-grey, reduced fabric with moderate, ill-sorted inclusions of quartz and what appeared to be crushed iron slag. The outer surface of this sherd was off-white in colour, with numerous partly vitrified grains of sand adhering to it. This was provisionally assigned as the miscellaneous medieval fabric 99, since no match to its unusual inclusions could be found elsewhere.

Post-medieval

Post-medieval sherds accounted for most of this limited pottery assemblage. Body sherds of red wares (fabric 78), recovered from contexts 301, 404, 502, and 1302, were all undiagnostic in terms of precise form, although two may have been from large bowls. All except one of

these sherds had black or brown glazes, and in one instance, bore white-trailed slip decoration as well. These were all likely to be 17th-18th century, or possibly slightly later, in date.

Sherds of brown-glazed buff wares (fabric 91) were found in contexts 402 and 502, and all dated from the 18th century. Context 502 yielded two adjoining sherds, one of which was part of a flanged base, indicating these were from a large jar or vase.

A single sherd of tin-glazed ware (fabric 82.5), with incised and blue-painted decoration, was found in context 502. This material may have been manufactured in either England or the Netherlands, during the 17th or early 18th centuries. Mid-18th century, white, salt-glazed stonewares (fabric 81.5), in the form of a beaded rim sherd (possibly from a chamber-pot) and a base sherd from a dish), were found in contexts 402 and 502, respectively.

The only late post-medieval or modern pottery finds were small sherds of blue and white glazed china (fabric 85) of either 19th or 20th century manufacture, recovered from context 102.

5.3 Other artefacts

Clay pipes
A single piece of clay pipe stem, from a broad 17th-19th century date range, was found in context 203.

Glass
The only glass find was a base of a dark green, cylindrical bottle, hand-blown and 17th-18th century in date.

Tile
Fragments of flat roof tiles were recovered from contexts 102, 301, 402, 403 and 502. The sandy, oxidised fabrics and thicknesses were consistent with these being 18th to early 19th century tiles, though earlier dates could not be ruled out, owing to the lack of diagnostic from features. Two fragments of machine-made roof tile, late 19th or 20th century in date, were recovered from context 203.

Brick and other ceramic material
Part of a roughly formed, unfrogged brick, 104mm (4⅛") wide × 53mm (2⅛") thick, was recovered from context 301. It bore no traces of mortar. Owing to its small, non-standard thickness, this brick remains undated, but was likely to have been made before the imposition of the Brick Tax in 1784.

Irregular lumps of fired clay, bearing impressions of burnt-out plant stems, were found in contexts 102 and 403, and may have been building daub that had been subjected to high temperatures.

Slag
Fragments of slag were found in context 104, some with small pieces of coal adhering . These were probably waste from post-medieval iron processing.

5.4 Overview of artefactual evidence

The finds from this site were practically all indicative of domestic occupation and use. The *terminus post quem* dates deduced for the various contexts are shown in Table 3.

Context	Material class	Object specific type	Fabric code	Count	Weight (g)	Start date	End date	*tpq* range
U/S	ceramic	pot	99	1	26	undated	undated	-
102	ceramic	brick/tile	-	1	30	undated	undated	2000
	ceramic	pot	85	2	2	1800	2000	
	ceramic	pot	91	1	18	1700	1900	
	ceramic	roof tile(flat)	-	1	28	1700	1850	
103	ceramic	fired clay/ daub	-	1	148	undated	undated	-
104	ceramic	fired clay/ daub	-	1	34	undated	undated	1600-1900
	slag	-	-	8	14	1600	1900	
106	bone	-	-	1	12	undated	undated	?1200-1350
	ceramic	pot	99	2	10	1200	1400	
203	ceramic	roof tile (flat)	-	2	54	1850	1950	1850-1950
	ceramic	brick/tile	-	2	20	undated	undated	
	mineral	coal	-	1	8	undated	undated	
	ceramic	clay pipe	-	1	2	1600	1900	
	glass	bottle	-	1	164	undated	undated	
301	ceramic	brick	-	2	938	undated	undated	1700-1850
	ceramic	roof tile (flat)	-	4	406	1700	1850	
	ceramic	pot	78	1	84	1600	1800	
402	ceramic	roof tile (flat)	-	4	308	1700	1850	1720-1850
	ceramic	bottle	-	1	40	1600	1750	
	ceramic	pot	81.5	1	48	1720	1770	
	ceramic	pot	91	1	4	1700	1800	
403	ceramic	roof tile (flat)	-	6	190	1700	1850	1700-1900
	ceramic	clay pipe	-	4	12	1600	1900	
	bone	bone	-	1	4	undated	undated	
404	ceramic	pot	78	1	10	1600	1800	1600-1800
502	ceramic	roof tile (flat)	-	2	474	1700	1850	1720-1850
	ceramic	roof tile	-	1	396	1700	1850	
	ceramic	pot	78	2	44	1700	1800	
	ceramic	pot	81.5	1	34	1720	1770	
	ceramic	pot	82.5	1	14	1590	1730	
	ceramic	pot	91	2	54	1700	1800	
1302	ceramic	pot	78	1	4	1600	1800	1700-1800
	ceramic	pot	91	1	54	1700	1800	

Table 3: Summary of context dating based on artefacts

6. Environmental analysis, by Elizabeth Pearson and Nick Daffern

In Trench 1 an organic deposit (106) consisting of a greyish brown sandy silt (with darker lenses at the base) was recorded, but it is uncertain whether this was a ditch, watercourse or build up of organic deposits in a hollow. There was some interleaving of this deposit with a sequence of organic deposits immediately to the south. The latter consisted of greyish slightly organic silty sands overlying a dark peaty layer from which two cattle horncores were retrieved. Other sizable pieces of animal bone were seen in this deposit but were unrecoverable at the base of an unstable section. These deposits were more extensive and may be the remains of a pond, presumably open at the same time as context 106. Medieval pottery was recovered from the upper part of 106. The earliest date for formation of organic deposits here is uncertain but as cattle horn cores were recovered from the dark peaty layer at the base it is assumed that the build up of peaty deposits does not predate the Neolithic period.

The thin peaty layer in Trench 3 extension (303) may be the southern-most extent of the organic deposits seen in the Trench 1 extension as it is similar to the basal peaty deposit.

6.1 Macrofossil remains by Elizabeth Pearson

The environmental evidence recovered is summarised in Tables 1 to 3.

6.1.1 Hand-retrieved material

Two cattle horn cores were recovered from a dark peaty deposit at the base of the Trench 1 extension. A cattle sized rib and other bones were seen at the base of west facing section but not recovered as the section was unstable.

6.1.2 Remains from bulk samples

Waterlogged plant remains were well preserved in a dark peaty layer (303) interpreted as the earliest organic deposit. These were dominated by herbaceous plant remains. Identifiable remains were dominated by seeds of waterside margin or bankside plants such as crowfoot (*Ranunculus* sbgen *Batrachium*), celery-leaved crowfoot (*Ranunculus sceleratus*) and sedge (*Carex* sp), while buttercup (*Ranunculus acris/repens/bulbosus*) and nettle (*Urtica dioica*) are likely to have grown in grassland (potentially damp grassland) in the near vicinity. Sheep's sorrel (*Rumex acetosella*), docks (*Rumex* sp), corn marigold (*Chrysanthemum segetum*) and campion (*Silene* sp) suggest cultivated or disturbed ground nearby. Insect remains were moderately abundant and may have the potential to provide information on the aquatic conditions and surrounding environment.

Waterlogged plant remains were also abundant in a sample from the top of 106, dated to the medieval period by pottery. This deposit appears to be contemporary with the adjacent dark peaty layer to the south (considered to be the same as 303) at the base as interleaving of the two deposits was noted during fieldwork. This assemblage was dominated by unidentified woody material but identifiable plant remains were primarily made up seeds of plants common in neglected grassland or scrub, as indicated by the presence of seeds of bramble (*Rubus* sect *Glandulosus*), elderberry (*Sambucus nigra*), hemlock (*Conium maculatum*) and nettle (*Urtica dioica*). Campion (*Silene* sp), chickweed (*Stellaria media*) and sheep's sorrel indicate some cultivated or disturbed ground, as seen in layer 303 (above), but signs of wet bankside vegetation are limited to occasional seeds of celery-leaved crowfoot (*Ranunculus sceleratus*). Occasional pottery, iron slag and charred plant remains were also noted.

6.1.3 Discussion

The plant remains from the base and top of the sequence of organic deposits show a typical progression from a marsh or pond surrounded by herbaceous vegetation (two different features), with little indication of well-established vegetation such as hedgerow or scrub, to a drier environment with neglected and overgrown areas colonised by brambles and elderberry. There was no direct evidence from the plant macrofossil remains of craft and industrial activity (such as flax or hemp retting or textile related activities) as has been seen in other marsh or pond areas in urban environments. However, pottery and slag indicate some human activity in the near vicinity.

6.2 Palynological remains by Nick Daffern

The contexts from which samples were taken for pollen analysis are listed in Table 4 below.

Context Number	Sample Number	Depth (m OD)
303	<2>	N/A
106	<4>	67.86
106	<4>	68.55
106	<4>	68.15

Table 4: List of pollen samples

The results of the analysis are presented in Table 5 and Fig 4. All samples contained pollen in a good preservation and concentrations. The results of the assessment are as follows:

Context 303, Sample <2>

The sample from the undated peat layer in Trench 3 was dominated by herbaceous species (76% Total Land Pollen, or TLP), in particular Poaceae undiff (grasses) which contributed 30% TLP. Additional herbaceous species at lower percentages were also present such as *Ranunculus acris*-type (meadow buttercup) contributing 8% TLP with remaining species such as *Centaurea cyanus* (cornflower), *Plantago lanceolata* (ribwort plantain), *Aster*-type (daisy/aster), *Urtica dioica* (stinging nettle) and *Cerealia* indet (unidentifiable cereals) contributing <5% TLP.

Despite tree and shrub pollen contributing less than herbaceous species (23% TLP), the species diversity was relatively high. *Corylus avellana*-type (hazel) was the dominant contributor (13% TLP) with the remaining species *Alnus glutinosa* (alder), *Betula* (birch), *Fraxinus excelsior* (ash), *Quercus* (oak), *Salix* (willow) and *Ulmus* (elm) contributing <4% TLP.

Heaths were represented by a sole grain of *Calluna vulgaris* (heather/ling) although spores and aquatics were better represented through identifications of *Pteridium aquilinum* (bracken) and *Typha latifolia* (bulrush).

Context 106, Monolith <4>: 67.86m OD

Domination by herbaceous species (75% TLP) was a feature of the basal sample from monolith <4> with *Poaceae* undiff again dominating (49% TLP). Additional herbaceous species representing <5% TLP included *Plantago lanceolata*, *Ranunculus acris*-type, Apiaceae (carrot family), *Cirsium*-type (thistle), *Erodium* undiff (stork's-bills), *Cichorium intybus*-type (dandelion), Cyperaceae undiff (sedges) and *Filipendula* (meadowsweet). A single grain of *Cerealia* indet was also identified.

Tree and shrub pollen represented 17% TLP with *Corylus avellana*-type the most frequently identified species (7% TLP) although pollen of *Alnus glutinosa*, *Betula*, *Quercus* and *Salix* was identified in lower percentages (<5% TLP)

Heaths represented 7% TLP with *Calluna vulgaris* (5%TLP) the main contributor although grains of *Erica* indet (heaths) were also identified. Aquatics and spores were represented in low quantities by Lemnaceae (duckweed family), *Typha latifolia*, *Polypodium* (polypody), *Pteridium aquilinum* and *Pteropsida* (mono) indet (ferns).

Context 106, Monolith <4> (106): 68.15m OD

The middle sample from monolith <4> showed a similar trend to the lower sample with herbaceous species dominating, representing 72% TLP with Poaceae undiff once again the dominant contributor. *Filipendula* was a lesser contributor (6% TLP) as were *Cichorium intybus*-type, *Ranunculus acris*-type and *Aster*-type. This sample also contained a greater quantity of cereal pollen with Cerealia indet, *Avena/Triticum*-type (oat/wheat), *Hordeum*-type (barley) and *Secale cereale* (rye) being identified although caution must be noted due to the overlap in aperture size and surface sculpturing of cereal and "non-domesticated" grass pollen. A single grain of *Cannabis*-type (hop/hemp), another possible cultivar, was also identified.

The presence of tree and shrub pollen increased within this sample (25% TLP) with *Alnus glutinosa* becoming the dominant contributor (11% TLP) although *Corylus avellana*-type (6% TLP) was still present. The pollen of *Betula, Fraxinus excelsior*, *Quercus*, *Salix* and *Sorbus*-type (whitebeam/hawthorn/rowan) was also identified.

Heaths were present in lower concentrations within this sample representing just 3% TLP with *Calluna vulgaris* and *Erica* cf *tetralix* (cross-leaved heath) the two species identified.

Aquatics and spores were represented by *Potamogeton natans*-type (broad-leaved pondweed), *Typha latifolia*, *Polypodium* and *Pteropsida* (mono) indet.

Context 106, Monolith <4>: 68.55m OD

The upper sample of the sequence exhibited the same herbaceous domination from the previous samples (75% TLP) with *Poaceae* undiff maintaining its dominance at a consistent 36% TLP although cereal pollen was less well represented with only *Cerealia* indet being identified at 6% TLP. *Centaurea cyanus* and *Ranunculus acris*-type were the joint second-highest contributors at 7% TLP with remaining herbaceous species such as *Aster*-type, *Cichorium intybus*-type, *Plantago lanceolata* at <4% TLP. Single grains of *Cannabis*-type, cf *Adonis annua*-type (pheasant's-eye), *Cuscuta europea*-type (dodder), *Ononis*-type (restharrows) and *Papaver argemone* (prickly poppy) were also identified.

A total of 22% TLP was represented by tree and shrub species with *Corylus avellana*-type (7% TLP) the most commonly identified with *Alnus glutinosa*, *Betula*, *Quercus* and *Salix* also present. Previously unidentified species were *Tilia cordata* (small-leaved lime) and *Pinus sylvestris* (Scot's pine).

Calluna vulgaris was the sole heath species identified and represented 3% TLP. No aquatics were identified within this sample although the spores of *Polypodium*, *Pteridium aquilinum* and *Pteropsida* (mono) indet were present.

Fungal spores and parasite ova

Fungal spores were present in all the assessed samples with *Torula* and *Cladosporium* the two most commonly identified. Both genera are ubiquitous and cosmopolitan in their distribution although both are typically associated with plant litter and decaying plant matter with *Torula* sp particular associated with herbaceous stems, both living and dead.

Spores of the genus *Alternaria* were identified in the upper sample (68.55m OD) from monolith <4>. It is a major plant pathogen causing blight, lesions and canker on a wide variety of species including potatoes, carrots, wheat and tomatoes and is also often associated with decaying and decomposing material.

The spores of the bracket fungi *Ganoderma* were infrequently present within the sample from the middle of 106 (68.15m OD), monolith <4>. Species of *Ganoderma* are wood-decaying fungi which grow on both coniferous and hardwood tree species causing decay and a loss of strength (Schwarze and Ferner, 2003).

Small quantities of *Trichuris* (whipworm) ova were identified in context (303) sample <2>, the only sample to contain parasite ova. Unfortunately, this genus is present within the intestinal tract and faecal material of many mammals including humans, livestock and domestic pets and therefore identifying the source is extremely difficult, although because the deposit was not a cesspit or latrine, it is more likely that the *Trichuris* ova are non-human in origin.

6.2.1 Discussion

The palynological remains identified from this assessment indicate an open grassland landscape with a strong agricultural focus as indicated by the presence of cereal pollen and indicators of arable agriculture. The presence of indeterminate cereal pollen at 5% TLP and rye pollen at 2% TLP in the middle sample from context 106 (68.15 m OD) parallels the work of Greig (1999) at Lammascote Road, Stafford where similar percentages were identified from late Saxon/early medieval deposits. The presence of cornflower, which increases in abundance in the upper levels of monolith 4, is often associated with medieval arable agriculture (Colledge and Greig 1992, Greig 1991, Greig 1999) as is the presence of hop/hemp pollen, both of which have frequently been identified at numerous sites in the region from deposits of medieval date including Kings Pool, Stafford (Bartley and Morgan 1990, Colledge and Greig 1991), Crose Mere, Shropshire (Beales 1980) and Aqualete Mere (Pittam 2006). Despite the presence of these indicator species which suggest an early-mid medieval date for the sequence, radiocarbon dating would be a more accurate method of dating the deposits that were encountered.

The contribution of tree and shrub species was limited throughout the sequence and the majority of those that were identified were probably resident in hedgerow or damp scrub which lay immediately adjacent to the feature although oak, lime, ash and in particular Scot's pine probably represent more distant, established woodlands.

The presence of heather and heaths may be explained through long distance transport from heathland although an alternative is that they may indicate dumping of domestic material such as roofing, flooring or bedding although this hypothesis is flawed as the grains that were identified were not stuck together in the typical fashion which occurs when the parent plant material is added directly to the deposit (Moore *et al* 1991, 90) and therefore the former must assumed.

The work of Pittam (2006) at Aqualete Mere is of particular interest as relates to future research associated with this sequence as not only is it the closest comparable site in a spatial sense, it is an extremely high resolution sequence which would allow intensive comparison and discussion to occur as regards the contrasts and similarities between rural (Aqualete Mere) and marginal urban (Stafford St) sites during the medieval period.

6.3 Synthesis

The plant macrofossil remains (and deposits seen on the site) show a change from extensive wet marshy conditions, with no evidence of shrub or woodland vegetation, to a reduced area of wet ground with little evidence for marsh or bankside vegetation but with predominantly wood or scrub vegetation and overgrown, grassy areas. It is likely that the woody vegetation, contemporary with the upper deposits of 106, was localised and grew more or less *in situ*, perhaps overhanging a pond or watercourse as this is not reflected in the pollen spectrum; its presence is probably masked by the pollen from a predominantly grassland and arable landscape beyond. The presence of damp decaying wood and plant matter was, nevertheless, indicated by fungal spores at the top of the sequence. The overgrown areas during the 13th to early 14th centuries may have been localised, but could indicate a less intensive use of the site generally. The results show potential to provide information on changes in localised vegetation and ground water conditions, although species diversity is low and evidence for human activity is limited. Animal bone, however, was found in the lower peaty deposits in Trench 1 (probably the same as 303) which shows some disposal of domestic or industrial waste.

There are some differences between these and the pollen results which provide more detailed information on human activity in the vicinity. Arable cultivation is reflected in the pollen results, particularly for the middle of the organic deposit in Trench 1 (106) where oat/wheat, barley and rye have been identified. This combination of crops (usually including wheat and rye) was particularly common during the medieval period, where they were grown together to protect against crop failure (Greig 1988). Rye was also a common crop on sandy soils during the Saxon and medieval periods as it outperforms wheat in these conditions (Greig 1988). High levels of cornflower (*Centaurea cyanus*) present in the upper part of 106 are also associated with arable cultivation, although here cereal pollen levels are slightly lower.

Results could be compared to those available from Aqualate Mere located 2.5 kilometres to the north-east of Newport (Pittam 2006). Here, there is evidence for a relatively high level of arable agriculture during the Norman period which correlates with documentary records. During the high medieval period reduced cereal levels are evident which are interpreted as reflecting a documented change towards enclosure and a move towards pastoralism. The beginning of the climatic decline or the 'Little Ice Age' is also mentioned as possibly affecting cereal pollen production.

At Newport the presence of hop/hemp pollen provides additional evidence for human activity in the area–possibly hemp retting in a pond *in situ* or hop cultivation further afield. Overall, there is some variation through the pollen spectrum for the site so the pollen evidence has the potential to provide information on the changing environment and human activity in the area which can be compared to results from Aqualate Mere to the east. Here, detailed comparison of palynological and documentary data has been carried out.

The level of change seen through the sequence of deposits at Stafford Street suggests that the deposits formed from the Saxon or early medieval period as the changes seen in most pollen profiles for the prehistoric to Roman periods are not evident. The environment appears to have changed dramatically during the late medieval to early post-medieval period as there is a cessation in the formation of organic deposits, while deposition of sands and gravels may indicate flooding events or even dumping to improve the ground surface. The sands and gravels overlying the organic deposits in Trench 3 are relatively clean, but there are some lenses of occupational debris higher in sands overlying 106 (Section 4.1.3), so while dumping is a possible interpretation, their formation is open to interpretation. In the late post-medieval period this area was under cultivation.

7. Synthesis

7.1 Undated deposits

Although deposit 106 identified in Trench 1 was dated to the medieval period, finds were only retrieved from the upper part of the deposit. It is conjectured that the waterlogged deposits identified in the extension to Trench 1, Trench 3 and Test pits 8, 9 and 11, although as yet undated, date from the medieval period or possibly earlier.

7.2 Medieval

The marshy area/pond identified in the northern part of the site was clearly water filled during the medieval period, as the upper part contained medieval pottery dated from the 13th to early 14th century. A possible revetment for the edge of this feature was identified in Trench 1. The approximate extent of this marshy area/pond is shown on Figure 2.

The *Central Marches Historic Towns Survey of Newport* (Buteux 1996) has highlighted that the town lies within an area of meres and pools, the most well known being the Newport Pool, which probably existed before the foundation of the town and is most likely to be the site of a fishery mentioned in the Domesday Survey of 1086. Peat deposits in the Newport area may date from after the end of the last Ice Age (10,000 BP) when the retreat of ice resulted in the formation of numerous pools and hollows in the alluvium (Prentice 1986 cited in Pearson 1996). At Stafford Street the date of the earliest formation of peat or organic deposits is uncertain, but is possibly Saxon or early medieval in date. Evidently a wet area, most likely a pond or marsh and possibly a ditch or stream, was open during the medieval period. At this time tenement plots (SA 6095) stretched from High Street across the site to a stream running along the line of the modern Audley Road and Water Lane (Buteux 1996) and hence the potential for disposal of domestic and industrial refuse in the pond or marsh is high. Animal bone waste and hop or hemp pollen hints at this.

7.3 Post-medieval

The marshy area/pond in the northern part of the site was consolidated by the dumping of material in the early post-medieval period onwards. In the post-medieval period a number of tanneries were located on the stream (and are known from the medieval period in the town). It is possible, therefore, that tannery waste may be found in organic deposits on this site. Although the recovery of two cattle horn cores cannot be taken as definitive evidence of tanning waste, it is at least the type of bone waste that would be expected. Horn cores and foot bones (metapodials and phalanges) are typical of tanning waste.

Ditch 204 was located at the southeast end of Trench 2 running roughly parallel with Stafford Street and was cut in to natural 202. This ditch represents the boundary between the two medieval burgage/tenement plots that formerly ran back from the High Street during the medieval layout of Newport (Fig 2). The boundary ditch was in use well in to the post medieval period as the finds recovered from the upper part of the ditch were dated from 1850 to 1950.

A cultivation soil seen in Trenches and Test Pits 1, 2, 4, 9, 10, 11 and 13 dates from the post-medieval period and probably corresponds to the orchard and gardens shown on the Ordnance Survey 1882 map (not illustrated). In other trenches remains of structures which relate to buildings shown on Ordnance Survey plans were identified. Brick rubble seen in some of the trenches relate to the demolition of these buildings.

8. Potential of environmental deposits, by Elizabeth Pearson

It is clear that the organic deposits revealed have the potential to provide information on the changing environment and possibly craft and industrial activities carried out in the vicinity during the medieval and post-medieval periods. Their significance can be set within the context of information available on organic deposits known to exist in Newport and further afield in the wetlands of northern Shropshire and Staffordshire.

Overall, the presence of organic deposits in this location is of importance as it provides a rare opportunity to recover well preserved environmental and cultural material in association with urban settlement. The organic deposits at Newport are situated between two areas of wetland surveyed as part of the North West Wetlands Survey: these are the Weald Moors and the meres of north Staffordshire (Leah *et al* 1998) and as such the area has been identified as holding a high quality palaeoenvironmental archive. Although many good peat sequences survive, deterioration of the peat archive has been identified as a result of modern development, forestry and drainage and hence management of the resource is a priority for this region.

The significant deposits were identified in the northern part of the site where the ground is lower. To the south only post-medieval features and deposits were identified.

9. Publication summary

The Service has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, the Service intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

An archaeological evaluation and watching brief was undertaken at a site off Stafford Street, Newport, Shropshire (centred on NGR SJ 7470 1917). It was undertaken on behalf of CgMs Consulting Ltd for their clients McCarthy and Stone (developments) Ltd who intend to develop the site as retirement flats for which a planning application has been submitted.

The project aimed to determine if any significant archaeological site was present and if so to indicate what its location, date and nature were.

Five evaluation trenches were excavated. The watching brief element comprised the monitoring of the lifting of a concrete slab and tarmac and the removal of retaining walls. The excavation of five geo-technical test pits was also monitored along with the removal of a vehicle inspection pit and two buried fuel tanks after decommissioning.

In the northern part of the site a marshy area/pond was identified. This was clearly water filled during the medieval period as the upper part contained medieval pottery dated from the 13th to early 14th century. A possible revetment for the edge of this feature was identified. The lower parts of these peaty deposits, although undated, could date from before the medieval period, perhaps earlier.

In the early post-medieval period and later this area was consolidated by the dumping of material.

A cultivation soil seen in some of the trenches dates from the post-medieval period and probably corresponds to the orchard and gardens shown on the Ordnance Survey 1882 map. In other trenches remains of structures which relate to buildings shown on later Ordnance Survey maps were identified. Brick rubble seen in some of the trenches probably relates to the demolition of these buildings.

Environmental sampling of the deposits in the northern part of the site was carried out which has provided information on the progression of this environment from a marsh or pond to a drier area of woodland or scrub. It is clear that the organic deposits revealed have the potential to provide information on the changing environment and possibly craft and industrial activities carried out in the vicinity during the medieval and post-medieval periods. Their significance can be set within the context of information available on organic deposits known to exist in Newport and further afield in the wetlands of northern Shropshire and Staffordshire.

10. Acknowledgements

The Service would like to thank the following for their kind assistance in the successful conclusion of this project, Cathy Patrick (CgMs Consulting Ltd), Gene Childs (McCarthy and Stone Ltd), Dave Mee (M Lambe construction) and Mike Watson (Historic Environment Officer, Shropshire County Council).

11. Personnel

The fieldwork and report preparation was led by Jo Wainwright. The project managers responsible for the quality of the project were Tom Rogers and Tom Vaughan. Fieldwork was undertaken by Jo Wainwright and Adam Lee, finds analysis by Dennis Williams, environmental analysis by Elizabeth Pearson and Nick Daffern and illustration by Carolyn Hunt.

12. Bibliography

Association for Environmental Archaeology, 1995 *Environmental archaeology and archaeological evaluations. Recommendations concerning the environmental component of archaeological evaluations in England*, Working Papers of the Association for Environmental Archaeology **2**

Barber, K E, 1976 History of Vegetation, in S Chapman (eds) *Methods in Plant Ecology*, Oxford: Blackwell Scientific Publications, 49-52

Bartley, D D and Morgan, A V, 1990 The palynological record of the King's Pool, Stafford, England*, New Phytologist*, 116: 133-144

Beales, P W, 1980 The late Devensian and Flandrian vegetational history of Crose Mere, Shropshire, *New Phytologist*, 85: 133-144

Bennett, K D, 1994 *Annotated catalogue of pollen and pteridophyte spore types of the British Isles*, unpublished report, Department of Plant Sciences, University of Cambridge

Buteux, V, 1996 *Archaeological assessment of Newport, Shropshire*, Central Marches Historic Towns Survey, Hereford and Worcester County Council, report **347**

Cappers, T R J, Bekker, R M, and Jans, J E A, 2006 *Digitale Zadenatlas van Nederland: Digital seed atlas of the Netherlands*, Groningen Archaeological Studies, **4**, Barkhuis Publishing and Groningen University Library: Groningen

CAS, 1995 (as amended) *Manual of Service practice: fieldwork recording manual*, County Archaeological Service, Hereford and Worcester County Council, report, **399**

Colledge, S and Greig, J, 1991 *Stafford, Kings Pool pollen results*, unpublished typescript

Colledge, S and Greig, J 1992 Environment in Woodiwiss, S (ed.) 1992 *Iron Age and Roman salt production and the medieval town of Droitwich: excavation at the Old Bowling Green and Friar Street* CBA Research Report No. 81: 96-105

English Heritage, 2002 *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Centre for Archaeology Guideline

Grant-Smith, E, 2000 *Sampling and Identifying Allergenic Pollens and Molds: An Illustrated Identification Manual for Air Samplers*, San Antonio, Texas; Blewstone Press

Greig, J 1988 Plant resources, in Grenville Astill and Annie Grant, *The countryside of medieval England*, Blackwell, 112

Greig, J, 1991 The early history of the cornflower (*Centaurea cyanus* L.) in the British Isles, *Acta Interdisciplinaria Archaeologica (Nitra, SK)* **7**, 97-109

Greig, J 1999 Pollen analysis in Pearson, L, Greig, J and Jordan, D *Environmental remains from a watching brief at Lammascote Road, Stafford*, Historic Environment and Archaeology Service, Worcestershire County Council, unpublished internal report, 767

HEAS, 2009 *Worcestershire online ceramic database* [online], Worcestershire Historic Environment and Archaeology Service, Worcestershire County Council, http://www.worcestershireceramics.org

HEAS, 2010 *Proposal for an archaeological evaluation at Stafford Street, Newport, Shropshire*, Historic Environment and Archaeology Service, Worcestershire County Council, unpublished document dated 9 March 2010, **P3493**

Hurst, J D, and Rees, H, 1992 Pottery fabrics; a multi-period series for the County of Hereford and Worcester, in Woodiwiss, S G (ed), *Iron Age and Roman salt production and the medieval town of Droitwich*, CBA Res Rep, **81**, 200-209.

IfA, 2008a *Standard and guidance for archaeological field evaluation,* Institute for Archaeologists

IfA, 2008b *Standard and guidance for an archaeological watching brief,* Institute for Archaeologists

Kirk, P M, Cannon, P F, Minter D W and Stalpers J A 2008 *Dictionary of the Fungi 10th Edition*, Wallingford: CABI Publishing

Leah, M D, Wells, C E, Stamper, P, Huckerby, E, and Welch, C, 1998 *The Wetlands of Shropshire and Staffordshire. North West Wetlands survey,* **5**, Lancaster Imprints

Moore, P D, Webb, J A, and Collinson, M E, 1991 *Pollen analysis*, (2nd edition), Oxford; Blackwell Scientific Publications.

Patrick, C, 2004 *Stafford Street, Newport; archaeological desk-based assessment*, CgMs Consulting Ltd, unpublished report 5145, dated October 2004

Patrick, C, 2010 *Stafford Street, Newport, Shropshire; Written Scheme of Investigation for archaeological evaluation*, CgMs Consulting Ltd unpublished document dated March 2010

Pearson 1996 in Buteux

Pittam, N, 2006 *Aspects of vegetation and land use changes during historical times from English lowland lake records*, Unpublished PhD thesis, Coventry University

Prentice, R, 1986 A history of Newport, Chichester

Schwarze, F W M R and Ferner, D 2003 Ganoderma on Trees - Differentiation of species and studies of invasiveness. *Arboricultural Journal* 27, 59-77-

Stace, C, 1991 *New Flora of the British Isles*, Cambridge; Cambridge University Press

Stace, C, 1997 *New Flora of the British Isles* (2nd edition), Cambridge; Cambridge University Press

Tables

Context	Sample	Spit/Sub-sample	Feature type	Period	Sample volume (L)	Volume processed (L)	Residue assessed	Flot assessed
106	1	1A (IL wash-over)	Pond/watercourse	Medieval or earlier	10	0.1	Yes	Yes
106	1	1B (20L flotation)	Pond/watercourse	Medieval or earlier	30	20	Yes	Yes
303	3		?Pond	Undated	20	0.1	Yes	Yes

Table 1: List of environmental bulk samples

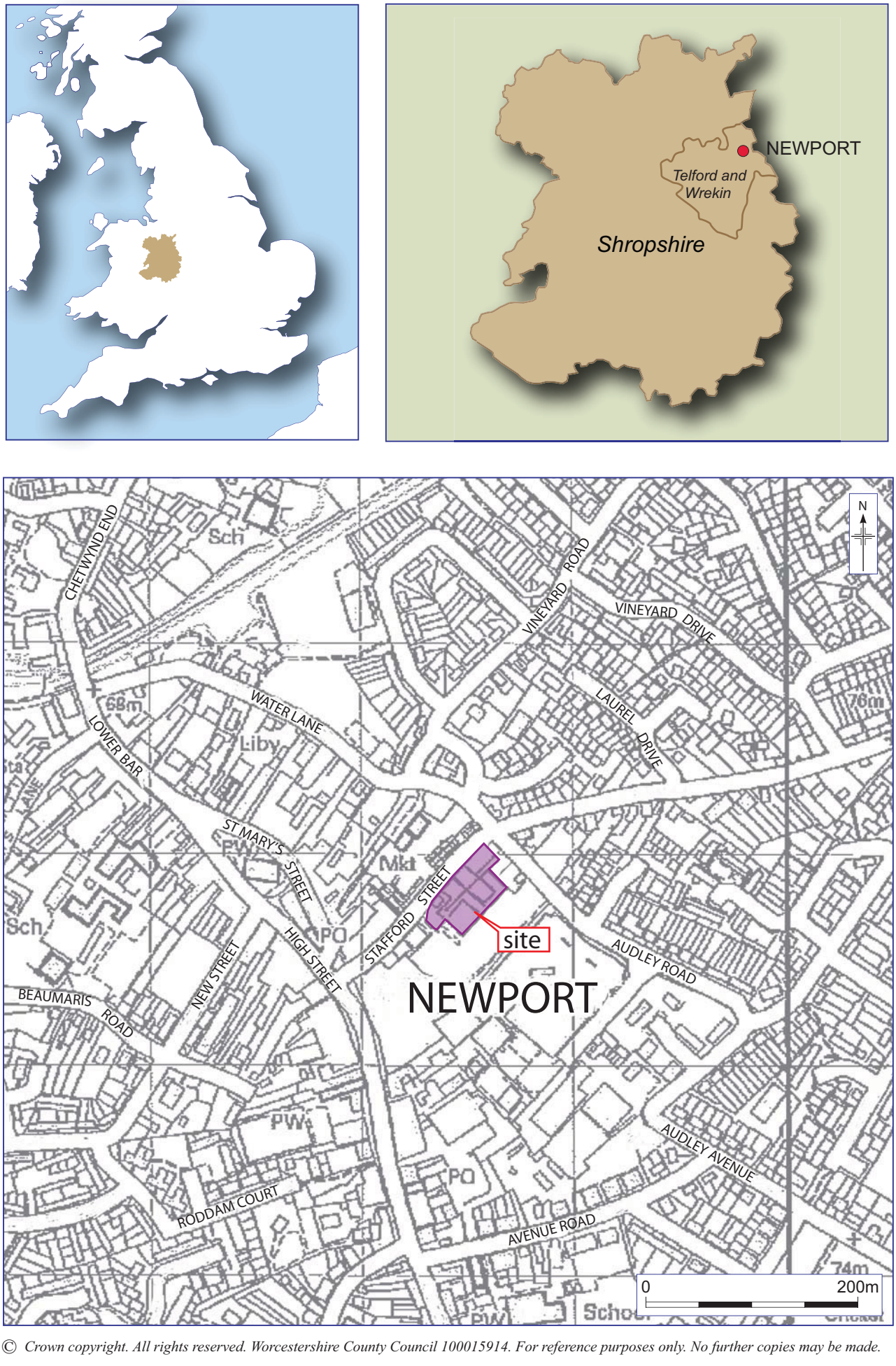
Context	Sample	insect	charred plant	waterlogged plant	Comment
106	1A	occ		abt	
106	1B		occ	abt	occ pottery & fe slag
303	3	occ/mod		abt	

Table 2: Summary of environmental remains from bulk samples

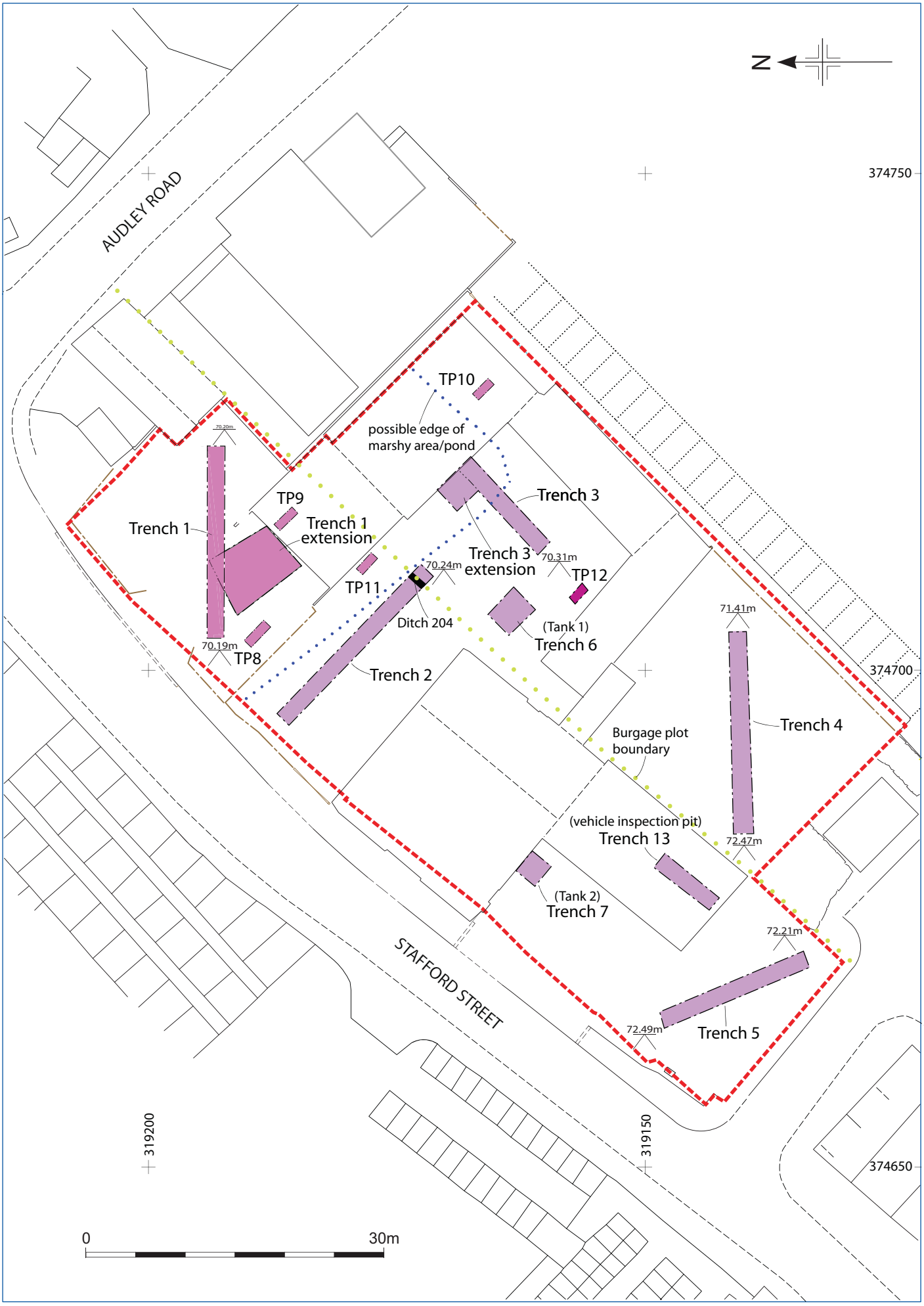
	Family	Common name	Habitat	160	106	303
Sample volume (L)				1	20	1
Latin name						
Ranunculus acris/repens/bulbosus	Ranunculaceae	buttercup	CD	+		+
Ranunculus sceleratus	Ranunculaceae	celery-leaved buttercup	E	+	+	+
Ranunculus flammula	Ranunculaceae	lesser spearwort	E			++
Ranunculus sbgen *Batrachium*	Ranunculaceae	crowfoot	E			+/++
Urtica dioica	Urticaeae	common nettle	ABCD	+		+
Urtica urens	Urticaeae	small nettle	AB			+
Chenopodium album	Chenopodiaceae	fat hen	AB	+	+	
Atriplex sp	Chenopodiaceae	orache	AB		+	
Stellaria media	Caryophyllaceae	common chickweed	AB	+		
Cerastium sp	Caryophyllaceae	mouse ear	DE			+
Silene sp	Caryophyllaceous	campion	AB	++		++
Rumex acetosella	Polygonaceae	sheep's sorrel	ABD			+
Rumex sp	Polygonaceae	dock	ABCD			+
Rumex sp (nutlets)	Polygonaceae	dock	ABCD		+	
Rubus sect *Glandulosus*	Rosaceae	bramble	CD	+	+++	
Conium maculatum	Apiaceae	hemlock	AB	++	+	
Solanum nigrum	Solanaceae	black nightshade	AB		+	
Galeopsis tetrahit	Lamiaceae	common hemp-nettle	AB		+	
Sambucus nigra	Caprifoliaceae	elderberry	BC	+	++	
Chrysanthemum segetum	Asteraceae	corn marigold	AB			+
Carex sp (2-sided) nutlets	Cyperaceae	sedge	CDE		+	+
unidentified wood fragments	unidentified			++++	++++	
unidentified herbaceous fragments	unidentified			++		++++

Table 3: Waterlogged plant remains from bulk samples

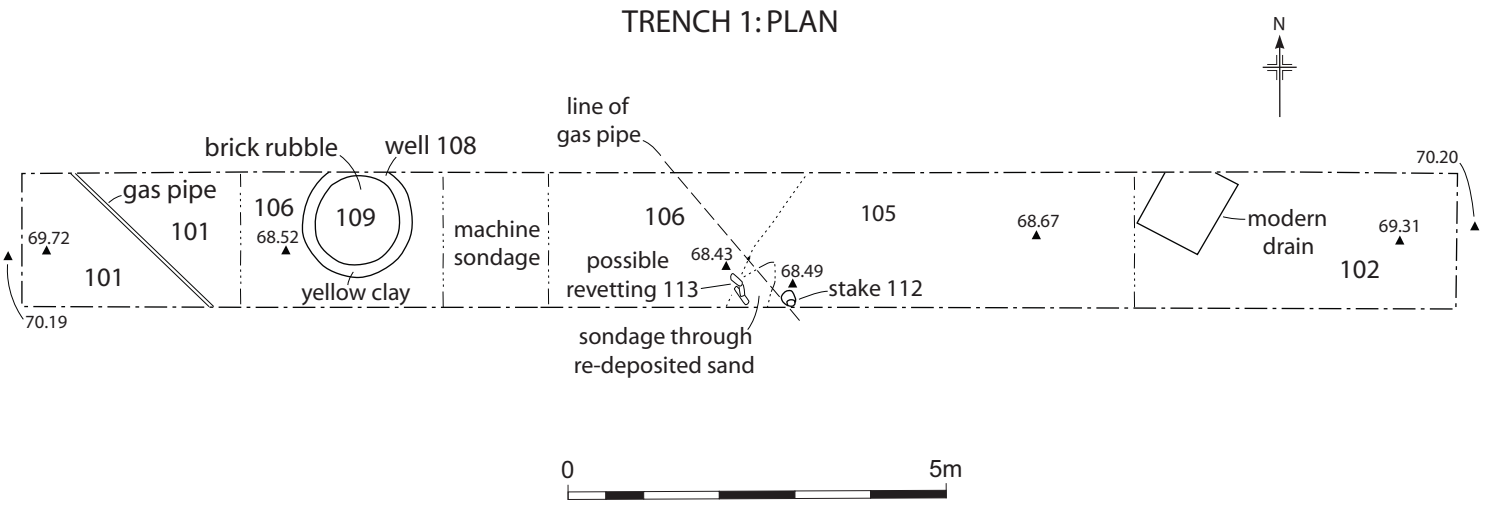
Latin Name	Family	Common Name(s)	68.55 m OD <4>	68.15m OD <4>	67.86m OD <4>	<2> (303)
Alnus glutinosa	Betulaceae	alder	6	17	9	6
Betula	Betulaceae	birch	4	1	3	2
Corylus avellana-type	Betulaceae	hazel	11	9	11	20
Sorbus-type	Rosaceae	whitebeam/ hawthorn/ rowan		1		
Fraxinus excelsior	Oleaceae	ash		2		1
Pinus sylvestris	Pinaceae	Scot's pine	1			
Quercus	Fagaceae	oak	6	6	3	4
Salix	Salicaceae	willow	4	4	2	2
Tilia cordata	Malvaceae	small-leaved lime	2			
Ulmus	Ulmaceae	elm				1
Calluna vulgaris	Ericaceae	heather/ ling	4	3	9	1
Erica cf *tetralix*	Ericaceae	cross-leaved heath		2		
Erica sp	Ericaceae	heath			3	
Poaceae undiff	Poaceae	grass	55	57	80	47
Cerealia indet	Poaceae	unidentifiable cereal	9	8	1	5
Avena/ *Triticum*-type	Poaceae	oat/wheat		1		
Hordeum-type	Poaceae	barley		3		
Secale cereale	Poaceae	rye		3		1
cf *Adonis annua*-type	Ranunculaceae	pheasant's-eye	1			
Achillea-type	Asteraceae	yarrows/ chamomiles				1
Apiaceae	Apiaceae	carrot family	2	1	2	
Artemisia-type	Asteraceae	mugwort			2	1
Aster-type	Asteraceae	daisy/aster	6	3	2	6
Caryophyllaceae	Caryophyllaceae	pink family	2	2	2	3
Cannabis-type	Cannabaceae	hop/ hemp	1	1		
Centaurea cyanus	Asteraceae	cornflower	10	1		7
Cerastium-type	Caryophyllaceae	mouse-ears				1
Chenopodioideae	Amaranthaceae	goosefoot subfamily	1	1		1
Cichorium intybus-type	Lactuceae	chicory/dandelion	6	5	3	3
Cirsium-type	Asteraceae	thistle	1	1	3	5
Cuscuta europea-type	Convolvulaceae	dodder	1			
Cyperaceae undiff	Cyperaceae	sedge	1	2	3	
Erodium undiff	Geraniaceae	stork's-bills			2	
Filipendula	Rosaceae	dropwort/ meadowsweet		10	3	1
Rubiaceae	Rubiaceae	bedstraw family				1
Lactuceae undiff	Asteraceae	chicory/dandelion/sow-thistle		1	2	2
Ononis-type	Fabaceae	restharrows	1			
Papaver argemone	Papaveraceae	prickly poppy	1			1
Plantago lanceolata	Plantaginaceae	ribwort plantain	3		8	6
Plantago major	Plantaginaceae	greater plantain				2

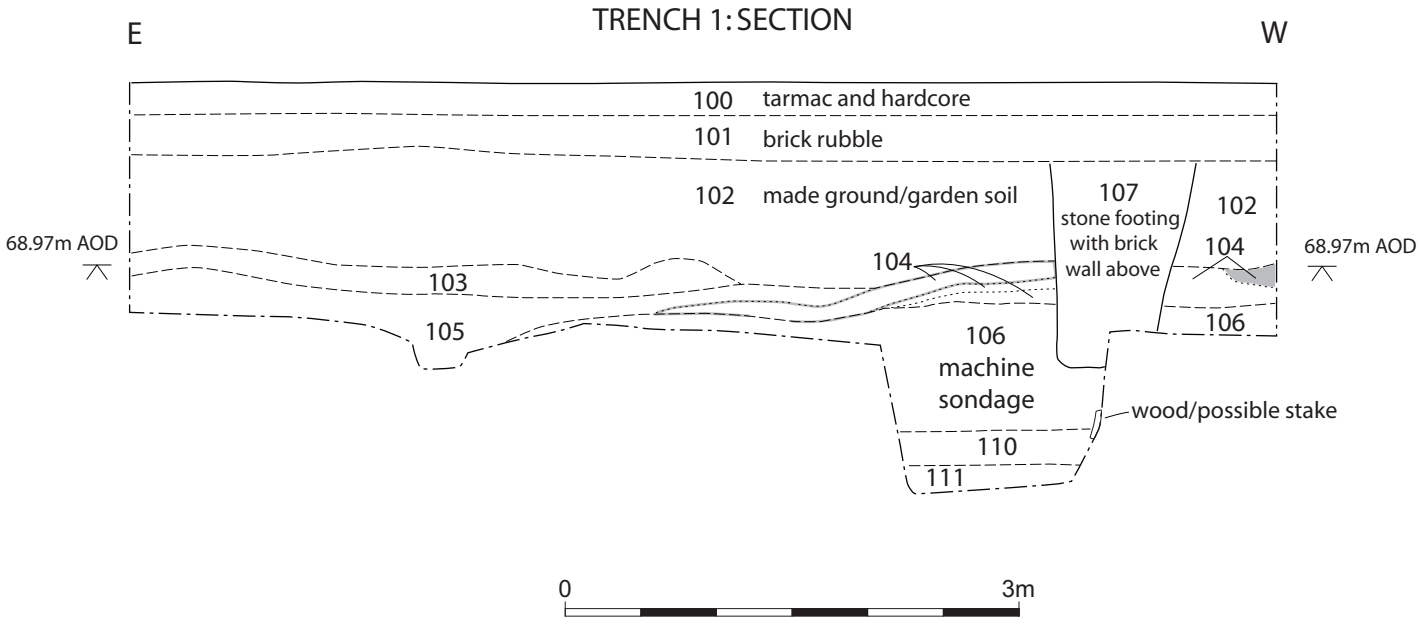


Location of the site *Figure 1*



Location of Trenches and Test Pits *Figure 2*





Trench 1 plan and section *Figure 3*

Latin Name	Family	Common Name(s)	68.55 m OD <4>	68.15m OD <4>	67.86m OD <4>	<2> (303)
Plantago sp	Plantaginaceae	plantain			1	
Polygonum aviculare	Polygonaceae	knotgrass				1
Ranunculus acris-type	Ranunculaceae	meadow buttercup	10	8	6	12
Rosaceae	Rosaceae	rose family		1		
Rumex acetosella	Polygonaceae	sheeps sorrel		1		1
Rumex obtusifolius-type	Polygonaceae	broad-leaved dock				1
Saxifragaceae	Saxifragaceae	saxifrage			2	2
Saxifraga granulata-type	Saxifragaceae	meadow saxifrage		2		
Scabiosa columbaria	Dipsacaceae	small scabious		1		
Silene cf *flos-cuculi*	Caryophyllaceae	ragged-robin				1
Brassicaceae	Brassicaceae	cabbage family				1
Urtica dioica	Urticaceae	stinging nettle	2		2	5
		TLP Grains counted	151	158	164	155
Lemnaceae	Lemnaceae	duckweed family			2	
Polypodium	Polypodiaceae	polypody	1	2	1	
Potamogeton natans-type	Potamogetonaceae	broad-leaved pondweed		6		
Pteridium aquilinum	Dennstaedtiaceae	bracken	1		7	3
Pteropsida (mono) indet		ferns	1	1	1	
Typha latifolia	Typhaceae	bulrush		2	1	5

Table 5: Pollen remains from Contexts 303 and 106

Figures

Plates

Plate 1: Trench 1, view south-east. Layer 106 with sondage within

Plate 2: Trench 1, view south. Layer 106 with possible revetment 113

Plate 3: Trench 3, view south-east. Peaty layer 303in section with 302 above

Plate 4: Trench 2, view south-west .Ditch 204 in foreground

Appendix 1 Trench descriptions

Trench 1

Maximum dimensions: Length: 19m Width: 2m Depth: *c* 2.80m

Orientation: East to West

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
100	Tarmac and hardcore	Tarmac and type 1 hardcore	0-0.2m
101	Demolition rubble/make-up Layer	Brick rubble from demolition of earlier buildings on site	0.2-0.5m
102	?garden soil/soil build up	Compact dark black brown sandy silt with moderate small to medium rounded stones, occasional fragments brick, tile, mortar, coal, charcoal and fuel ash.	0.5-1.2m
103	Levelling/ consolidation deposit	Compact mid orange brown with orange mottling silty sand. Occasional decayed orange sandstone, orange clay/daub fragments, brick and tile fragments and small to medium rounded stones. Similar to 104. Underlies 102.	1.2-1.4m
104	Levelling/ consolidation deposit	Moderately compact mid orange brown sandy silt with lenses of firm brown orange clay and daub and ironworking waste. Occasional brick and tile fragments and charcoal. Underlies 103.	1.2-1.4m
105	Re-deposited natural	Loose waterlogged mid yellow orange sands with occasional gravels and very occasional brick or tile flecks. Underlies 104.	1.4-minimum 1.6m
106	Watercourse/ pond deposit	Soft and waterlogged mid grey brown sandy silt with probably 30% humic material within deposit. Consisting of decayed wood and other organic remains. Underlies 105. Above 110. Stake/posthole 113 and ?revetment 112 driven into the edge of this deposit.	1.4-2.5m
107	Stone footing with brick wall above	Stone footing with brick wall above. Cuts 102.	0.5-1.30m
108	Well cut and lining	Circular cut lined with yellow clay. Cuts 102.	0.5-1.2m+
109	Well backfill	Brick rubble backfill of well.	0.5-1.2m+
110	Natural	Natural blue and orange sands below 106.	2.5-2.7m
111	Natural	Natural yellow and orange sands. Underlies 110.	2.7m+
112	Stake/post?	Remains of wooden stake/post? Driven into 106? To possibly form part of a revetment for 106	
113	Revetment?	Three possibly driven wooden stakes perhaps forming a revetment for 106.	

Trench 2

Maximum dimensions: Length: 22.20m Width: 1.8m Depth: *c* 1.30m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
200	Demolition rubble/make-up Layer	Brick rubble from demolition of earlier buildings on site. Varies in depth from 0.7m to 0.3m. Overlies 201	0-0.4m
201	?garden soil/soil build up	Very mixed sandy silt with 19th and 20th century pottey. In north-west of trench disturbed by buildings fronting onto Stafford Street. Below 200. Above 202 and 203.	0.4-0.6m
202	Natural	Natural orange sands which become cleaner with depth.	0.6m+
203	Fill	Dark brown grey humic silty sand with brick, occasional sub-rounded pebbles and coal. Produced 19th century pottery. Fill of 204	0.4-0.6m+
204	Ditch cut	Ditch cut running roughly parallel with Stafford St, Cuts 202. Probable boundary between tenement plots.	0.4-0.6m+

Trench 3

Maximum dimensions: Length: 21.50m Width: 1.8m Depth: *c* 1.70m

Orientation: Northwest to Southwest

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
300	Layer	Moderately compact dark black brown sandy silt with moderate small to large stones. Very frequent inclusions of ash, clinker, concrete, brick. Layer directly underneath concrete slab which was previously removed. Above 301 and 302.	0-0.30m
301	Levelling layer	Very mixed silty sand with very frequent inclusions of ash, clinker, concrete and brick. Above 302. 19th or 20th century in date.	0.3-0.7m
302	Natural	Natural orange sands which become cleaner with depth. Overlies 303.	0.6-1.5m
303	Peat deposit	Very humic and organic peat deposit presumably laid down during the deposition of the natural sands and gravel deposits. Overlies 304.	1.5-1.7m
304	Natural	Natural orange sands	1.7m+

Trench 4

Maximum dimensions: Length: 20m Width: 1.80m Depth: 1.50m

Orientation: East to West

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
400	Demolition rubble/make-up layer	Loose mid brown sandy silt with moderate small to medium rounded stones. Deposit also contained glass, brick, tile, concrete and mortar. 0.10-0.20m in depth.	0-0.20m
401	Clinker layer	Loose dark black fuels ash/clinker deposit. Observed in the first 9.50m from the west end of the trench. 0.10-0.20m in depth	0.20-0.40m
402	Fill. Dumped material	Moderately compact mid brown sandy silt with frequent post med bricks and mortar. Fill of [408].	0.40-1.1m+
403	Former cultivation layer	Moderately compact mid brown sandy silt with moderate small to medium rounded stones. Deposit also contains CBM and mortar fragments, charcoal flecks. Moderate root disturbance.	0.10-0.35m
404	Fill of ditch/ tree throw	Moderately compact mid brown sandy silt with moderate small to medium rounded stones. Deposit also contains CBM and mortar fragments, charcoal flecks.	N/A
405	Cut of ditch/ tree throw	Feature not excavated.	N/A
406	Fill. Dumped material	Moderately compact mid brown sandy silt with frequent post medieval bricks and mortar. Fill of [409].	0.10-0.74+
407	Natural	Loose mid orange and with gravel.	0.35-0.75m+
408	Cut for post medieval intrusion	Irregular shape in plan and profile. Excavated by machine. Total depth not identified. Filled by (402).	0.40-1.1m+
409	Cut for post medieval intrusion	Irregular shape in plan and profile. Excavated by machine. Total depth not identified. Filled by (406).	0.10-0.74+

Trench 5

Maximum dimensions: Length: 15.50m Width: 1.80m Depth: 1.25m

Orientation: North Northwest to South Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
500	Hardcore layer	Grey type 1 hardcore	0-0.15m
501	Disturbed natural layer	Moderately compact mid brown grey slightly silty sand, diffuse boundary to natural (504).	0.15-0.40m
502	Fill. Dumped material	Modern disturbance identified in northern ¾ of trench. Contains 19th and 20th century footings and floor surfaces and rubble, concrete and plastic from their demolition.	0.15-0.95m+
503	Cut for modern intrusion	Irregular shape in plan and profile. Excavated by machine. Total depth not identified. Filled by (502).	0.15-0.95m+
504	Natural	Loose mid orange sands	0.40m+

Trench 6 for removal of Tank 1

Maximum dimensions: Length: 3.70m Width: 3.00m Depth: 1.70m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
600	Demolition rubble/make-up Layer	Moderately compact dark black brown sandy silt with moderate small to large stones. Very frequent inclusions of ash, clinker, concrete, brick. Layer directly underneath concrete slab which was previously removed.	0-0.20m
601	Natural	Loose mid red orange natural sands.	0.20-1.70m+

Trench 7 for removal of Tank 2

Maximum dimensions: Length: 2.40m Width: 2.40m Depth: 1.60m

Orientation: N/A

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
700	Demolition rubble/make-up Layer	Loose mid to dark mixed layer, brown sandy silt containing brick, glass, tile, concrete, mortar and ash. Layer directly underneath concrete slab which was previously removed.	0-0.20m
701	Natural	Loose mid orange natural sands and gravels.	0.20-1.60m+

Test Pit 8

Maximum dimensions: Length: 2.80m Width: 1.00m Depth: 2.10m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
800	Demolition rubble/make-up Layer	Red brick rubble from demolition of earlier buildings on site.	0-0.60m
801	Makeup layer	Moderately compact/soft dark black brown grey sandy silt with moderate small to medium rounded stones and white glazed pottery and modern CBM.	0.60-1.30m
802	Layer	Soft mid grey brown silty sand with moderate small to medium rounded stones. Possible edge of extent of marshy area/pond seen in Trench 1 or interface between 801 and natural 803.	1.30-1.50m
803	Natural	Loose mid grey orange natural sands and gravels.	1.50-2.10m+

Test Pit 9

Maximum dimensions: Length: 2.50m Width: 0.80m Depth: 2.40m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
900	Demolition rubble/make-up Layer	Loose mid to dark mixed layer, brown sandy silt containing brick, glass, tile, concrete, mortar and ash. Layer directly underneath concrete slab which was previously removed.	0-0.60m
901	Layer	Moderately compact dark black brown sandy clay silt with occasional small to medium rounded stones and brick and tile.	0.60-1.00m
902	Layer	Soft dark grey brown sandy clay silt with moderate small to medium rounded stones.	1.00-1.40m
903	Layer	Loose mid yellow orange natural sands and gravels.	1.40-1.80m
904	Layer	Soft mid grey green brown silty sand with high organic content. Humic waterlogged deposit.	1.80-2.20m
905	Natural	Loose mid orange natural sands and gravels.	2.20-2.40m+

Test Pit 10

Maximum dimensions: Length: 2.20m Width: 0.80m Depth: 2.20m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
1000	Demolition rubble/make-up Layer	Loose mid to dark mixed layer, brown sandy silt containing brick, glass, tile, concrete, mortar and ash. Layer directly underneath concrete slab which was previously removed.	0-0.15m
1001	Layer	Moderately compact dark black brown sandy silt with moderate small to medium rounded stones.	0.15-0.50m
1002	Layer	Soft mid grey brown sandy silt with occasional small rounded stones.	0.50-1.00m
1003	Natural	Loose mid orange natural sands.	1.00-2.20m+

Test Pit 11

Maximum dimensions: Length: 2.20m Width: 0.90m Depth: 2.00m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
1100	Demolition rubble/make-up Layer	Loose mid to dark mixed layer, brown sandy silt containing brick, glass, tile, concrete, mortar and ash. Layer directly underneath concrete slab which was previously removed.	0-0.35m
1101	Layer	Moderately compact dark black brown sandy silt with moderate small to medium rounded stones and fragments of brick and tile. Also contained some rotting organic material (roots).	0.35-0.90m
1102	Layer	Soft mid grey brown sandy silt occasional small to medium rounded stones. Appears to be a water lain deposit.	0.90-1.40m
1103	Natural	Loose mid red orange natural sands.	1.40-2.00m+

Test Pit 12

Maximum dimensions: Length: 2.00m Width: 0.80m Depth: 2.20m

Orientation: Northwest to Southeast

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
1200	Demolition rubble/make-up Layer	Loose mid to dark mixed layer, brown sandy silt containing brick, glass, tile, concrete, mortar and ash. Layer directly underneath concrete slab which was previously removed.	0-0.30m
1201	Natural	Loose mid red orange natural sands with occasional small stones.	0.30-2.20m+

Trench 13. Vehicle inspection pit

Maximum dimensions: Length: 7.00m Width: 1.80m Depth: 1.10m

Orientation: Northeast to Southwest

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
1300	Demolition rubble/make-up Layer	Loose mid to dark mixed layer, brown sandy silt containing brick, glass, tile, concrete, mortar and ash. Layer directly underneath concrete slab which was previously removed.	0-0.20m
1301	Layer	Moderately compact mid grey brown sandy silt with occasional small to medium rounded stones and moderate mortar flecks. Possibly represents a disturbed relic garden soil.	0.10-0.50m
1302	Fill of post hole	Mixed deposit consisting of grey brown silty sand and re-deposited orange sand with occasional small to medium rounded stones and some root disturbance. Sealed by 0.10m of 1301.	0.20-0.65m
1303	Cut of post hole	This feature was only observed in section and had irregular convex sides and a flat base. 0.33m in width x 0.45m in depth.	0.20-0.65m
1304	Natural	Loose mid orange natural sands and gravels.	0.50-1.10m+

Appendix 2 Technical information

The archive

The archive consists of:

8	Context records AS1
9	Fieldwork progress records AS2
3	Photographic records AS3
118	Digital photographs
1	Drawing number catalogues AS4
1	Levels record sheets AS19
15	Trench record sheets AS41
2	Scale drawings
1	Box of finds
1	Sample recording sheet are AS17
2	Flot records AS21
4	Pollen record sheets
2	Bulk samples
1	Monolith sample
1	Bag of animal bones

The following samples will be discarded after a period of 6 months after the submission of this report, unless there is a specific request to retain these:

- Bulk samples from 106 and 303, and one monolith from 106

The project archive is intended to be placed at:

Shropshire County Museum
Shropshire County Council
Wenlock Lodge
Acton Scott
Church Stretton
Shropshire, SY6 6QN

Tel. Church Stretton (01694) 781306

Appendix 3 Pollen processing methodology (Tim Mighall, Department of Geography & Environment, University of Aberdeen)

ABSOLUTE POLLEN ANALYSIS: PREPARATION SCHEDULE

PRECAUTIONARY NOTES: All procedures, up to stage 25, should take place in the fume cupboard. Read precautionary notices on fume cupboard before starting. Ascertain whereabouts of First Aid equipment NOW. Please wear laboratory coat, gloves and goggles when dealing with all chemicals. Please organize fume cupboard carefully to maximize workspace. Use the containment trays provided. Always keep the fume cupboard door down as far as practically possible. Make sure the fume cupboard is switched on and functioning correctly.

A) SOLUTION OF HUMIC COMPOUNDS

1) Switch on hotplate to heat water bath. Prepare 12 to 16 samples concurrently.

HCl. is an irritant and can cause burns. Wear gloves. Wash with water if spilt on your skin.

Using a clean spatula, place a known volume or weight of sediment (c. 2cm^3) and one spore tablet in each 50ml centrifuge tube. Add a few cm^3 of distilled water (enough to cover the pellet and tablets) and a few drops of 2M HCl. Wait until effervescence ceases, then half fill tubes with 10% KOH; place in a boiling water bath for 15 minutes. Stir to break up sediment with clean glass rod. Return HCl and KOH bottles to the chemical cabinet.

2) Centrifuge at 3,000 rpm for 5-6 minutes, ensuring first that tubes are filled to the same level. This applies throughout the schedule (Mark 7 on centrifuge).

3) Carefully decant, i.e. pour away liquid from tube, retaining residue. Do it in one smooth action.

4) Disturb pellet using vortex mixer; add distilled water, centrifuge and decant.

5) Using a little distilled water, wash residue through a fine (180 micron) sieve sitting in filter funnel over a beaker. NB Be especially careful in keeping sieves, beakers and all tubes in correct number order. Wash residue on sieve mesh into petri dish and label the lid. If beaker contains mineral material, stir contents, wait four seconds, then decant into clean beaker, leaving larger mineral particles behind. Repeat if necessary. Clean centrifuge tube and refill with contents of beaker.

6) Centrifuge the tubes and decant.

B) HYDROFLUORIC ACID DIGESTION

***(Only required** if mineral material clearly still present. Otherwise, go to stage 13)*

NB Hydrofluoric acid is extremely corrosive and toxic; it can cause serious harm on contact with eyes and skin. Rubber gloves and mask/ goggles MUST be worn up to and including stage 11. Please fill sink with H_20; have $CaCo_3$ gel tablets ready. Place pollen tube rack into tray filled with sodium bicarbonate.

7) Disturb pellet with vortex mixer. Add one cm^3 of 2M HCl.

8) With the fume cupboard sash lowered between face and sample tubes, very carefully one-third fill tubes with concentrated HF (40%). Place tubes in water bath and simmer for 20 minutes.

9) Remove tubes from water bath, centrifuge and decant down fume cupboard sink, flushing copiously with water.

10) Add 8cm^3 2H HCl to each tube. Place in water bath for 5 minutes. Do not boil HCl.

11) Remove tubes, centrifuge while still hot, and decant.

12) Disturb pellet, add distilled water, centrifuge and decant.

C) ACETYLATION

NB Acetic acid is highly corrosive and harmful on contact with skin. Wash with H_20 if spilt on skin.

13) Disturb pellet, add 10cm^3 glacial acetic acid, and centrifuge. Decant into fume cupboard sink with

water running during and after.

14) Acetic Anhydride is anhydrous. Avoid contact with water. The acetylation mixture can cause severe burns if spilt on skin. Wash with water.

15) Make up 60cm^3 of acetylation mixture, just before it is required. Using a measuring cylinder; mix acetic anhydride and concentrated sulphuric acid in proportions 9:1 by volume. Measure out 54cm^3 acetic anhydride first, then add (dropwise) 6cm^3 concentrated H_2S0_4 carefully, stirring to prevent heat build—up. Stir again just before adding mixture to each tube.

Disturb pellet; then add 7cm^3 of the mixture to each sample.

16) Put in boiling water bath for 1-2 minutes. (Stirring is unnecessary—never leave glass rods in tubes as steam condenses on the rods and runs down into the mixture reacting violently). One minute is usually adequate; longer acetylation makes grains opaque. Switch off hot plate.

17) Centrifuge and decant all tubes into large (1,000ml) beaker of water in fume cupboard. Decant contents of beaker down fume cupboard sink.

18) Disturb pellet, add 10cm^3 glacial acetic acid, centrifuge and decant.

19) Disturb pellet, add distilled water and a few drops of 95% ethanol centrifuge and decant carefully.

D) DEHYDRATION, EXTRACTION AND MOUNTING IN SILICONE FLUID

20) Disturb pellet; add 10cm^3 95% ethanol, centrifuge and decant.

21) Disturb pellet; add 10cm^3 ethanol (Absolute alcohol), centrifuge and decant. Repeat.

22) Toluene is an irritant. Avoid fumes.

Disturb pellet; add about 8cm^3 toluene, centrifuge and decant carefully into 'WASTE TOLUENE' beaker in fume cupboard (leave beaker contents to evaporate overnight).

23) Disturb pellet; then using as little toluene as possible, pour into labelled specimen tube.

24) Add a few drops of silicone fluid - enough to cover sediment.

25) Leave in fume cupboard overnight, uncorked, with fan switched on. Write a note on the fume cupboard *'Leave fan on overnight - toluene evaporation',* and date it. Collect specimen tubes next morning and cork them. Turn off fan.

26) Using a cocktail stick, stir Contents and transfer one drop of material onto a clean glass slide and cover with a cover slip (22mm x 22mm). Label the slide.

27) Wash and clean everything you have used. Wipe down the fume cupboard worktop. Remove water bath from fume cupboard if not needed by the next user. Refill bottles and replace them in chemical cabinets.