



**Jackdaw Crag Quarry Southern Extension
Tadcaster
North Yorkshire**

Archaeological Evaluation by Trial Trenching

June 2010

Report No. 2082

CLIENT

Waste Recycling Group Limited

Jackdaw Crag Quarry Southern Extension Tadcaster North Yorkshire

Archaeological Evaluation by Trial Trenching

Summary

An archaeological evaluation by trial trenching was carried out on the site of the proposed southern extension of Jackdaw Crag Quarry, near Tadcaster. The work followed on from a geophysical survey which revealed the presence of a previously unrecorded landscape of former enclosure, field systems and trackways. A total of 20 trenches were targeted upon geophysical anomalies, sampling a range of archaeological features and deposits. The results indicate that the earliest activity took place in the pre-Roman Iron Age, most tangibly demonstrated in the form of a human burial that has been radiocarbon dated to 400-210 cal. BC. The main period of exploitation, as represented by the pottery appears to have been in the early to mid second century around 120-160 AD.



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Report Information

Client:	Waste Recycling Group Limited
Address:	6 Sidings Court, White Rose Way, Doncaster DN4 5NU
Report Type:	Trial trenching
Location:	Jackdaw Crag Quarry, near Tadcaster
County:	North Yorkshire
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Period(s) of activity represented:	Late Iron Age/Romano-British
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Project Management:	Ian Roberts BSc FSA MIfA
Fieldwork supervisor:	Iain McIntrye BA MA
Report:	Iain McIntyre, David Williams BA PIfA
Illustrations:	Jon Prudhoe, Ian Atkins
Photography:	Iain McIntyre, Site Staff
Specialists:	Diane Alldritt (carbonised plant and macrofossils and charcoal) John Cruse (quernstone) Hilary Cool (small finds) Geoff Gaunt (lithology) Malin Holst (human bone) Ruth Leary (pottery) Jane Richardson (animal bone) Phil Weston (flint)

Produced by:

Archaeological Services WYAS, PO Box 30,
Nepshaw Lane South, Morley, Leeds LS27 0UG
Telephone: 0113 383 7500
Email: admin@aswyas.com

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1 Introduction

An archaeological investigation was commissioned at the request of Richard Hunt of Turley Associates, acting on behalf of Waste Recycling Group Limited, to carry out an archaeological evaluation by trial trenching in the area of the proposed southern extension to Jackdaw Crag Quarry, near Stutton, Tadcaster. The archaeological work was required in order to establish the archaeological potential and significance of the site and so inform the Environmental Impact Assessment of the site to enable North Yorkshire County Council determine the planning application. A total of 20 trial trenches were targeted upon potential archaeological features and potentially blank areas, selected largely on the basis of the results of an earlier geophysical survey. The work was carried out on site between 22nd March and 22nd April 2010.

Site location and topography

The site lies approximately 1.5km west of the village of Stutton, to the south-west of Tadcaster, at SE 4650 4105 (Fig. 1). Topographically, the eastern part of the site lies at about 60m aOD, falling to 50m aOD in the central and western areas. A working farm and its access lane form the southern site boundary. Immediately to the north of the site is Jackdaw Crag Quarry.

Soils, geology and land-use

The geology of the site is Lower Magnesian Limestone, overlain by glacial sand and gravel drift (British Geological Survey 1974). The soils are of the Aberford Association, being shallow, brashy and well drained calcareous fine loams (SSEW 1980). The area is presently used as an arable field. A high pressure gas main runs approximately east to west through the northern part of the extension area.

2 Archaeological and Historical Background

A Desk-based Assessment revealed that although there was no known archaeology within the proposed extension area, or its immediate vicinity, the wider landscape contained extensive areas of cropmarks, typical of Late Iron Age and Romano-British settlement (Grassam 2009). A subsequent geophysical survey of almost the whole site (excluding the area of the gas pipeline) confirmed the existence of a number of former enclosures and field boundaries and a double ditched trackway (Webb and Wilkins 2009). These are typical of the later Iron Age and Romano-British settlement features found particularly on the Magnesian Limestone in this region (Roberts *et al.* 2010) and were visible mainly to the south of the gas pipeline, but clearly extended into the northern part of the site. Some of the linear geophysical anomalies produced a weak response and were potentially of natural origin.

3 Aims and Objectives

The aim of the targeted trial excavations was to sample the known features, represented by geophysical anomalies, to provide detailed information on their form, character, date and

function. Additionally the work aimed to establish the presence or absence of archaeological features that remained invisible to geophysical detection or had been masked by the effects of the gas pipe line. The results will inform the nature of the final mitigation measures required for the archaeology of the site prior to mineral extraction.

4 Methodology

A total of 20 trial trenches were excavated, being targeted upon anomalies revealed in the geophysical survey data, as well as apparently blank areas (Fig. 2). This represents a 2.3% sample (1400m²) of the proposed extension area. All work was carried out in accordance with accepted professional standards and guidelines (English Heritage 2006, Institute of Field Archaeologists 2008a; 2008b) and in accordance with the ASWYAS site recording manual (ASWYAS 2007).

The evaluation trenches varied in length and width, and were a combination of trial trenches and small open areas. Trenches targeted on possible enclosures and structures within the area of most intensive activity (Trenches 9, 13 and 14) were 4m wide, so that any internal features or structures were more easily identifiable. Other trenches were 10m by 25m, which targeted apparently blank areas of the site or with a view to identifying elements of unenclosed settlement. Trenches targeting the areas where geophysical results were not possible due to the gas pipeline, were positioned with an appropriate stand-off and were not within 15m of the pipe. Full details of trench sizes and the rationale behind the location of the 20 evaluation trenches are shown in Table 1.

Table 1. Trial trench details and rationale

No.	Orientation	Dimensions	Purpose
1	NE-SW	25m by 2m	To investigate a possible linear feature
2	N-S	25m by 2m	To investigate an apparently blank area of the site
3	N-S	25m by 2m	To investigate an apparently blank area of the site and the westward continuation of ditches to the east
4	E-W	50m by 2m	To investigate two possible linear features
5	E-W	25m by 2m	To investigate two possible linear features
6	E-W	25m by 2m	To investigate an apparently blank area of the site rendered blind to geophysical survey due to the effects of the mains gas pipe
7	E-W	10m by 5m	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
8	NE-SW	10m by 5m	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
9	E-W	50m by 4m	To investigate a series of enclosure ditches and possible structures
10	N-S	25m by 2m	To investigate a possible linear feature and an apparently blank area of site
11	N-S	25m by 2m	To investigate three linear ditches seemingly forming a succession of boundaries or trackways
12	N-S	10m by 5m	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
13	N-S	25m by 4m	To investigate an enclosure ditch and its interior, with respect to distinct

No.	Orientation	Dimensions	Purpose
			geophysical anomalies
14	N-S	25m by 4m	To investigate the possibility of settlement activity to the south of the Trench 13 enclosure, the apparent curtailment of the southern enclosure ditch and the field boundary to the south
15	E-W	50m by 2m	To investigate a possible enclosure and the continuity of the three linear ditches investigated by Trench 11
16	E-W	10m by 5m	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
17	N-S	50m by 2m	To investigate an apparently blank area of the site, an extensive area of magnetic disturbance and the field boundary to the south
18	E-W	25m by 2m	To investigate a potential boundary ditch and enclosure
19	NE-SW	25m by 2m	To investigate an apparently blank area of the site rendered blind to geophysical survey due to the effects of the pipe trench
20	E-W	25m by 2m	To investigate a potential boundary ditch and enclosure

The trenches were laid out using a Trimble Geo-explorer GPS system. The trench limits and exposed archaeological features were subsequently surveyed using a 5500 Geodimeter total station and fixed in relation to nearby permanent structures and to the Ordnance Survey national grid.

All topsoil and subsoil deposits were removed in level spits (not more than 0.2m) using a 360° excavator equipped with a smooth-bladed ditching bucket under direct archaeological supervision. All machining was stopped at the first identifiable archaeological horizon or natural deposits. The stripped surface was cleaned by hand and inspected for any archaeological remains.

All linear features were subject to a manual sampling regime of 10% of their total length within the trial trench, each section excavated was no less than 1m in length. Sections were, where possible, located adjacent to the trench edge in order that a full stratigraphic sequence could be recorded. All terminal-ends, corners and intersections were fully investigated. All discrete features revealed such as pits and post-holes were at a minimum 50% excavated (by area).

All archaeological features were accurately recorded in plan at a scale of 1:50 and all excavated features were recorded in sections at scales of either 1:10 or 1:20. All plans and sections include spot heights related to the Ordnance Datum (OD) in metres. A full written and photographic record was made of all archaeological features. A soil-sampling programme was undertaken for the identification and recovery of carbonised remains, vertebrate remains, molluscs and small artefactual material. Soil samples of up to 30 litres were taken from the fills of excavated features where appropriate.

The removal of human remains complied with the Burial Act 1857 and with the exhumation licence issued by the Ministry of Justice prior to the removal of the remains. The skeletal remains were all exposed and a full written, drawn and photographic record made prior to

removal. A soil sample of 10 litres was taken from the area of the lower torso and a soil sample of 30 litres from behind the skull as means of a control sample.

The work was monitored throughout by North Yorkshire Heritage Environment Section (NYHES). An inventory of the primary archive is presented in Appendix 1, and a concordance of contexts, finds and environmental samples is presented in Appendix 2. As required by NYHES, a copy of the Written Scheme of Investigation is presented in Appendix 3. ASWYAS currently hold the site archive in a stable and secure location.

5 Results

Introduction

A ploughed topsoil of dark black-brown clay-silt covered the entire site and in most instances directly covered the archaeological deposits or superficial geology. Subsoils, consisting of dark red-brown silts and sands, were observed but only infilling the uppermost aspects of the larger ditches where they had survived the effects of modern deep ploughing. The fills of the majority of features across the site consisted of a mix of limestone fragments (from the local bedrock geology via the superficial geology), igneous clasts (from unknown origins but transported and deposited via glacial action to form part of the superficial geology) and the natural accumulation and degradation of past soil horizons. The varying proportions of these parts aided in the interpretation of the deposition of the fills. The archaeological features and deposits within each trench are further described below.

A summary of the results from each trench, including trench dimensions, the archaeological features and finds recovered, along with a brief interpretation, is presented in Table 1. Plans of the key trenches are presented together with relevant sections in Figures 2-13.

Trial Trenching

Trench 1 (Fig. 2)

Trench 1 measured 26.1m by 2.1m. It was orientated north-east to south-west and was targeted to investigate a possible linear feature in the north-west corner of the site. Topsoil was removed to an average depth of 0.32m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay at 50.08m aOD. No linear feature was identified within the trench and further investigation around the supposed line of the anomaly revealed nothing and it is supposed that the anomaly here is a consequence of the geology. No other archaeological features or deposits were revealed.

Trench 2 (Fig. 2)

Trench 2 measured 24.9m by 2.1m and was orientated north to south. The trench was targeted upon an apparently blank area in the western margin of the site. Topsoil was removed to an average depth of 0.3m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay at 52.08m aOD. No archaeological features or deposits were revealed.

Trench 3 (Fig. 2)

Trench 3 measured 25m by 2m and was orientated north to south. The trench was targeted upon an apparently blank area in the south-west corner of the site and to investigate any westward continuation of ditches identified to the east. Topsoil was removed to an average depth of 0.34m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay, 52.89m aOD. No continuations of the ditches to the east were revealed nor any other archaeological features or deposits.

Trench 4 (Fig. 2)

Trench 4 measured 49.7m by 2m and was orientated east to west, and targeted to investigate two possible linear features with a weak geophysical response. Topsoil was removed to an average depth of 0.36m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay at 52.13m aOD. No linear features were identified within the trench and further investigation around the supposed lines of the anomalies revealed nothing. It is concluded that the weak geophysical anomalies here are due to geological changes. No other archaeological features or deposits were revealed.

Trench 5 (Figs 2 and 3)

Trench 5 measured 25.1m by 2m and was orientated east to west. The trench was targeted to investigate two possible linear features with a weak geophysical response. Topsoil was removed to an average depth of 0.34m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay, 52.18m aOD. No linear features were identified that corresponded to the geophysical anomalies and further investigation around the supposed lines of the anomalies revealed nothing. It is concluded that the weak geophysical anomalies here are due to geological changes. However, two ditches were identified within the centre of the trench (5002 and 5004), where no geophysical responses had been obtained.

Ditches 5002 and 5004 (Fig. 3, S.23 and S.24)

Ditch 5002 was located 12.7m from the eastern end of the trench. Ditch 5004 was located another 1.7m to the west of Ditch 5004. A possible third ditch was investigated to the west of Ditch 5004 but excavation revealed it to be a natural feature. A 1m section was excavated across both ditches and full profiles obtained. The cut of ditch 5002 was 1.18m wide and 0.36m deep with a wide flat-based U-shaped profile. It contained a single fill (5003) consisting of 15% sub-angular limestone gravel and cobbles (32 – 256mm) and 15% rounded igneous cobbles (64–256mm) in a dark brown-red silt-clay matrix. Twenty-three sherds from a Black Burnished ware jar from Dorset were recovered from the upper aspect of the fill. The date of the pottery is between AD 120-200. The nature of the fill, being a mixture of materials found in the superficial geology, indicates a gradual infilling. The cut of ditch 5004 was 0.95m wide and 0.3m deep with an irregular sided U-shaped profile and undulating base. It contained a single fill (5005), identical to fill 5003, with no finds. Together Ditches 5002

and 5004 might be interpreted to have marked a north-south field boundary, possibly articulating with the trackway to the north (see Trench 11).

Trench 6 (Fig. 2)

Trench 6 measured 25.2m by 2m and was orientated east to west. The trench was targeted upon an area of the central northern part of the site rendered blind to geophysical survey due to the effects of the gas pipeline. Topsoil was removed to an average depth of 0.42m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay at 51.69m aOD. No archaeological features or deposits were revealed.

Trench 7 (Fig. 2)

Trench 7 measured 10.4m by 5.22m and was orientated east to west. The trench was targeted to investigate an apparently blank area in the central part of the site, with a view to identifying elements of unenclosed settlement. Topsoil was removed to an average depth of 0.34m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay at 53.65m aOD. No archaeological features were observed in this part of the site.

Trench 8 (Fig. 2)

Trench 8 measured 10m by 5.2m and was orientated north-east to south-west. The trench was targeted to investigate an apparently blank area of the southern central part of the site with a view to identifying elements of unenclosed settlement just north of an enclosure (see Trench 9). Topsoil was removed to an average depth of 0.35m at which level the superficial geology was exposed – natural clays and silts with patches of weathered limestone at 54.92m aOD. No archaeological features or deposits were revealed.

Trench 9 (Figs 2 and 4)

Trench 9 measured 50.2m by 3.9m and was orientated east to west. The trench was targeted to investigate a series of enclosure ditches and possible structures in the southern central part of the site. Topsoil was removed to an average depth of 0.4m at which level the superficial geology was exposed – weathered limestone with patches of natural clay at 55.5-56.1m aOD. Seven ditches, two hollows and one pit were identified.

Ditch 9003 (Fig. 4, S.34)

Ditch 9003 was located 4.75m from the east end of the trench orientated north to south. A 1m wide section was excavated and a full profile obtained. The ditch cut was 1.5m wide and 0.8m deep with a U-shaped profile. It contained a single fill (9002) consisting of sub-angular limestone gravels (16-32mm) and sub-rounded igneous clast gravels, cobbles and boulders (16-256mm) in a dark yellow-brown silt-sand matrix. The fill contained six sherds of Romano-British pottery identified as Ebor Grey Ware from York dating to the early-mid second century. The nature of the fill, being a mix of materials found in the superficial geology, indicates a gradual infilling. This ditch is the north-south western boundary ditch of the main enclosure identified in the geophysical survey data.

Ditch 9005 (Fig. 4, S.39)

The east end of Ditch 9005 was located 12m from the east end of the trench and orientated east-west. The excavation of three 1m slots revealed Ditch 9005 to be 7.5m long with an average width of 0.95m, an average depth of 0.35m and a U-shape profile. It contained a single fill (9004) which consisted of sub-angular limestone and sub-rounded igneous clast gravels (16-128mm) in a dark yellow-brown silt-sand matrix. The fill contained a single fragments of Romano-British Black burnish ware and a fragment of handmade pottery. The black burnished sherd dates to the early-mid second century. A small amount of animal bone was also recovered from the fill. The nature of the fill indicates a natural accumulation of sediments. The east end of Ditch 9005 cuts through the fill (9008) of a pit (9007). The west end of Ditch 9005 terminates close to Ditch 9010 (see below).

Pit 9007 (Fig. 4, S.39)

Pit 9007 was located immediately to the north of Ditch 9005 which cut it southern edge. The pit was 2.25m wide and 0.44m deep with an irregular U-shaped profile. It contained a single fill (9006) consisting of sub-angular limestone gravels (8-64mm) in a yellow-brown silt-sand matrix. The nature of the cut and fill indicate a natural depression being filled through natural accumulation of eroded sediments. A single rim fragment of hand-made pottery was recovered from deposit 9006 and dates to a period between *c.*100BC and *c.*100AD.

Ditch 9010 (Fig. 4, S.41)

Ditch 9010 was located 20m from the east end of the trench and was orientated north to south. A 1m section was excavated that also investigated its relationship with Ditch 9005. The cut of Ditch 9010 was 1.5m wide and 0.37m deep with a U-shaped profile. It contained a single fill (9009) consisting of sub-angular limestone gravels (32-128mm) and sub-rounded igneous clasts (32-128mm) in a dark red-brown silt-sand matrix, resulting from erosion of the edges and natural silting. No finds were recovered from this fill. No relationship was obtained between Ditches 9005 and 9010 due to the insufficient depth of the stratigraphy.

Ditch 9014 (Fig. 4, S. 43)

Ditch 9014 was located 0.75m west of Ditch 9010, which ran parallel to it. A 1m section was excavated and a full profile obtained. The cut was 1.2m wide and 0.58m deep with an irregular U-shaped profile and contained three distinct fills. The primary fill (9011) consisted of sub-angular limestone gravels (8-64mm) in a yellow-brown silt-sand matrix and resulted from erosion of the cut edge. The secondary fill (9012) contained sub-angular limestone gravels and cobbles (8-128mm) within a dark red-brown sand resulting from erosion of the cut edge and accumulation of water-based sediments. The final fill (9013) consisted of sub-angular limestone gravels (2-32mm) in an orange-yellow silt-sand matrix. These fills are the result of a gradual accumulation of sediments. Two pottery sherds were recovered from deposit 9012; one was a fragment of Romano-British pottery while the other was a featureless hand-made pottery sherd.

Pit 9016 (Fig. 4)

Pit 9016 was located to the west of Ditch 9014. The pit cut has a diameter of 0.45m and a depth of 0.18m with a U-shape profile. It contained a single fill consisting of sub-angular limestone and sub-rounded igneous clasts (8-32mm) in a dark red-brown sand-silt. The nature of the fill differs from the erosion products of the superficial geology and seems to represent a deliberate and purposeful infilling. No relationship was observed between Ditch 9014 and Pit 9016.

Ditch 9017 (Fig 4, S.46)

Ditch 9017 was located 1.25m from the east end of the trench orientated north to south. A 1m section was excavated and a full profile obtained. The cut was 2.1m wide and 0.5m deep with a U-shaped profile. It contained a single fill (9019) consisting of sub-angular limestone gravels (16-128mm) in an orange-brown sand-clay matrix. The nature of the fill, being a mix of materials found in the superficial geology, indicates a gradual infilling. This ditch is the western return of the central enclosure identified in the geophysical data, and recorded as Ditch 13008 in Trench 13.

Ditch 9023, Ditch 9025 and Hollow 9027 (Fig. 4, S.48)

Ditch 9023 was located 20m from the west end of the trench and was orientated north to south. A 1m section was excavated and a profile obtained through Ditch 9023, as well as Ditch 9025, and Hollow 9027. The cut of Ditch 9023 had a maximum width of 2.1m and a depth of 0.5m, possessing a visible U-shaped profile. Ditch 9025 was located 15m from the west end of the trench orientated north to south. The cut of Ditch 9025 was up to 0.84m wide with a depth of 0.4m, possessing an irregular broad V-shape profile. Between the two ditches was an irregular depression (Hollow 9027) which was 2.75m wide and 0.4m deep. Only the southern part of the hollow was visible within the trench and it clearly extended northwards. Hollow 9027 had a primary fill (9026) consisting of sub-angular limestone gravels (16-64mm) in a red-brown sand-silt matrix which was highly organic. Above this fill a layer of cobbles, 1.6m wide and 0.05m thick. Comprising rounded igneous clasts (16-64mm) this surface represents an attempt to add a metalled surface. Lying directly over the cobbled layer was a deposit of burnt orange-black silt-sands 0.05m thick. This deposit produced a single iron object (SF 4). Sealing the burnt layer and the cobbled surface, and infilling cuts 9023 and 9025, was a final deposit (9028=9022, 9024) which was identical to fill 9026.

Trench 10 (Figs 2 and 5)

Trench 10 measured 26m by 2m and was orientated north-west to south-east. The trench was targeted to investigate a possible linear feature running north-east to south-west in an otherwise blank northern central part of the site. Topsoil was removed to an average depth of 0.35m at which level the superficial geology was exposed – natural clays and silts with patches of weathered limestone, 52.37m aOD to the north-west at 53.5-54.4m aOD to the south-east. A single ditch (10003) was identified running through the centre of the trench.

Ditch 10003 (Fig. 5, S.21)

Ditch 10003 was located 10.4m from the north-west end of the trench with the top of the cut at 52.84m aOD. A 1m section was excavated and a full profile obtained. The cut was 1.2m wide and 0.35m deep with a V-shaped profile. It contained a single fill (10002) consisting of sub-angular limestone gravel (32 – 64mm) and rounded igneous gravels (32–64mm) in a orange-brown clay-sand matrix. The nature of the fill, being a mix of materials found in the superficial geology and natural organic deposition, indicates a natural infilling. Ditch 10003 seems to have formed a field boundary that ran parallel to the trackway (see Trench 11).

Trench 11 (Figs 2 and 6; Plates 1-4)

Trench 11 measured 25.7m by 2m and was orientated north-west to south-east. The trench was targeted to investigate three parallel linear features seemingly forming a succession of boundaries or trackways all running north-east to south-west. Topsoil was removed to an average depth of 0.4m at which level the superficial geology was exposed – natural clays and silts with patches of weathered limestone at 54.1-55.8m aOD. The investigation of this trench revealed a ditch (11003) within which had been deposited a human skeleton of Iron Age date (11001) and two successions of ditches (11010/11012 and 11015/11016).

Ditch 11003 (Fig. 6, S.42; Plate 1)

Ditch 11003 was located at the north-west end of the trench. A 1.5m section was excavated and a full profile obtained. The cut was 2.25m wide and 1.12m deep with an irregular, flat-based, U-shaped profile and contained six distinct fills. The primary fill (11004) consisted of sub-angular limestone gravels and cobbles (32–256mm) and rounded igneous gravels and cobbles (32 – 256mm) in a brown-red clay-silt matrix. The nature of the fill suggests a deliberate infilling event. Lying above this fill was a single human skeleton (SK11001).

The skeleton (Fig. 6, S.42; Plate 2), which is radiocarbon dated to 400-210 cal. BC, was laid on its left side, the head to the south and facing west, and the legs slightly flexed, although the lower leg bones were not exposed. The human remains were from a male between 35 and 45 years of age, who suffered from halted growth during his childhood as well as poor dental health. The skeletal remains also indicated a congenital deformity of the first cervical vertebra.. The placement of the remains respected the alignment of the ditch, no discernable pit for the body was identified suggesting it was placed into the open ditch and covered with deposit (11006) which consisted of some very large stones sub-angular limestone gravels (8-64mm) and sub-rounded igneous gravels (32-128mm) in dark yellow-brown clay-silt, at least 30% of the fill sub-rounded igneous clast boulders (>256mm), the largest being 335mm in length. These stones were located in such a manner that suggest deliberate placement to cover the remains, or possibly the collapse of a more formal lining. Further inclusions consisted of 10% sub-angular limestone gravels and cobbles (16-256mm) and 10% sub-rounded igneous gravels and cobbles (16-256mm) within a dark red-brown sand-silt. No distinct grave cut was identified and it is conceivable that the body had just been concealed by a rudimentary cairn of stones in what was then bottom of the ditch. The excavation revealed no evidence for

grave goods, though it is possible that such could have been organic items made of wood and skins and such like which have not survived.

Deposit 11007 appears to have formed on the south-eastern side of the burial and ditch 11003 and consisted of a dark yellow brown silty clay with sub-angular limestone gravels and sub-rounded Igneous gravels, a single animal tooth from a cow was recovered from this deposit and may have been associated with the burial.

Deposit 11007 and the burial were sealed by fill 11008, a dark brown-red clay silt, probably accumulated through the deposition of water-based sediments. In contrast the fifth fill (11009) consists of sub-angular limestone gravels and cobbles (16-256mm) and sub-rounded igneous stone cobbles (64-128mm) in dark yellow-brown clay-silt matrix.

Ditches 11010 and 11012 (Fig 6, S. 50; Plate 3)

Ditch 11010 was located 3.5m south-east of Ditch 11003. Ditch 11012 ran parallel to ditch 11010 along its south-east edge. A 1m section was excavated across both ditches and full profiles obtained. The cut of Ditch 11010 was 3.2m wide and 1.14m deep with a wide flat-based U-shaped profile featuring convex edges. The primary fill (11011) contained sub-angular limestone gravel and cobbles (32 – 256mm) and rounded igneous cobbles (64–256mm) in a dark brown-red silt-clay matrix. The cut of Ditch 11012 was 1.6m wide and 0.54m deep with a wide flat-based U-shaped profile and contained a single fill (11013) identical to fill 11011. The nature and size of the inclusions within both these fills indicate infilling through erosion at the south-eastern edges, presumably the locations of the up-cast banks. Covering both fills 11011 and 11013, fill 11014 consisted of sub-angular limestone gravel (8-16mm) within a dark red-brown silt-clay matrix. Two very abraded white slipped Ebor 1 sherds belonging to a flagon dating to the early-mid second century pieces of were recovered from this fill. The characteristics of fill 11014 are similar to the subsoil (11001) seen within this trench and represent another example of subsoil having survived the effects of ploughing through infilling of the depression left by the ditch.

Ditches 11015 and 11016 (Fig. 6, S.49; Plate 4)

Ditches 11015 and 11016 together represent a succession of ditched boundaries to the south-east of Ditch 11012. A 1m section was excavated and a full profile obtained. Collectively the ditches combined cut width of 2.07m, and a depth of 0.64m. Although there is no indication in the fill which ditch is primary, it can be deduced from the projected cuts that individually each ditch was probably about 1.5m wide. The profile of both is a distinct U-shape, although there is good reason to suppose from the profile of 11016 that another re-cut is represented in its southern side. A single fill (11017) was contained within the total cuts. This consisted of sub-angular limestone gravel (8-16mm) within a dark brown-red silt-clay matrix and contained no finds. The nature of the fill indicates a slow steady infilling, which rather belies the evidence for re-cutting. It is possible that the re-cutting was by way of enlargement and that the whole product of three recuts was open at one time and infilled as one.

Trench 12 (Fig. 2)

Trench 12 measured 9.6m by 5.2m and was orientated north to south. The trench was targeted to investigate an apparently blank area in the eastern central part of the site with a view to identifying elements of unenclosed settlement immediately north of the enclosed elements. Topsoil was removed to an average depth of 0.36m at which level the superficial geology was exposed – natural clays and silts with patches of weathered limestone at 55.49m aOD. No archaeological features or deposits were revealed.

Trench 13 (Figs 2 and 7; Plate 5)

Trench 13 measured 25m by 4m and was orientated north-west to south-east. The trench was targeted to investigate an enclosure ditch and its interior, with respect to distinct geophysical anomalies. Topsoil was removed to an average depth of 0.4m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural sands and clay at 55.5-56.5m aOD. A single large ditch (13003/13007), two gullies (1308 and 13014) and a single pit (13005) were identified.

Ditch 13003/13007 (Fig. 7, S.29 and S.30; Plate 5)

Cuts 13003 and 13007 represent the two terminal ends of a shallow gully 8.3m long, orientated north to south and located within the centre of the trench. The width of the cut ranges from 0.36 to 0.5m and the depth from 0.11 to 0.19m, and displays a distinct U-shape profile. At its southern end cut 13003 cuts the fill (13004) of pit 13005. Fills 13002 (Ditch 13003) and 13006 (Ditch 13007) are identical and consist of limestone gravel (2-4mm) in an orange-grey sandy-silt and are the result of natural infilling through water-based sedimentation. During machine excavation on the surface of fill 13002 a large quern fragment was recovered, (Plate 8; SF. 1), subsequent hand excavation of the same location (fill 13002) produced three large fragments of stamped mortaria dated to AD 120-140. The relationship between the quern and the mortaria contexts remains unclear.

Pit 13005 (Fig. 7, S.29; Plate 5)

Pit 13005 was located near to the south-west trench edge, 7.5m from the southern end of the trench. The pit cut was 2.3m long by 0.94m wide and 0.55m deep exhibiting a V-shaped profile with a rounded base. The single fill (13004) consisted of a yellow-brown silt-sand which contained a cache of modern seeds and a small amount of wood charcoal which could not be identified. This may suggest the pit functioned as a fire pit, although *in situ* burning was absent. However, the upper aspect of the pits eastern edge and fill had been truncated by gully 13003.

Ditch 13008 (Fig. 7, S.35)

Ditch 13008 was located at the north-west end of the trench orientated north-east to south-west. A 1m section was excavated and a full profile obtained. The cut was 1.6m wide and 0.93m deep with a flat-based, U-shaped profile and contained five distinct fills. The primary fill (13009) consisted of sub-angular limestone gravels (16-32mm) in a orange-brown silt-

clay matrix and is a product of erosion from the cut edges. The secondary fill (13010) consisted of a dark grey-brown clay-silt matrix. The highly organic nature of the fill might suggest an accumulation of sediments in low-flowing water coupled with an influx of deliberately deposited burnt material. The tertiary fill (13011) contained no inclusions over 2mm and consists of a brown-orange clay. This fill was formed from the slumping of the natural glacial clays from the southern edge. The fourth fill (13012) contained 80% sub-angular limestone gravels and cobbles (32-128mm) within an orange-brown clay silt. Like the lower fill (13011) this fill was formed from the slumping of the natural sediments from the southern edge. The final fill (13012) contained sub-angular limestone gravels (32-64mm) in dark orange-brown clay-silt matrix. The nature of this fill is similar to the modern topsoil identified in Trench 11 having survived the effects of ploughing through infilling of the depression left by the ditch. No finds were recovered from any of the five fills but this ditch is the northern return of an enclosure system identified in the geophysical data.

Gully 13014 (Fig. 7, S.35)

Gully 13014 truncates the northern part of Ditch 13008, and its fills (13009, 13012 and 13013), and is orientated east to west across the trench. The cut was 1.2m wide and 0.43m deep with a wide flat-based U-shaped profile. It contained a single fill (13015) containing no inclusions over 2mm with a brown-orange silt-clay matrix.

Trench 14 (Figs 2 and 8; Plate 6)

Trench 14 measured 25.2m by 4m and was orientated north-west to south-east. The trench was targeted to investigate the possibility of settlement activity to the south of the Trench 13 enclosure, the apparent curtailment of the southern enclosure ditch and the field boundary to the south. Topsoil was removed to an average depth of 0.4m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural sands and clay at 56.7-57.7m aOD. A large ditch (14004) and gully (14006) were identified.

Ditch 14004 (Fig. 8, S.37; Plate 6)

Ditch 14004 was located at the south-east end of the trench orientated east to west. A 1m section was excavated and a full profile obtained. The cut was 1.5m wide and 0.6m deep with a wide, U-shaped profile. The primary fill (14003) consisted of sub-angular limestone gravels (4-8mm) in a yellow-brown clay-silt matrix and is a product of erosion from the cut edges. The secondary fill (14002) consisted of sub-angular limestone and sub-rounded igneous clast gravels and cobbles (32-264mm) within a dark orange-brown sand-silt. This fill contained the largest group of Romano-British pottery recovered from the excavations. The pottery had a date range from the late first to mid second century and consisted of a Black Burnished ware dish, jar, an Ebor tankard, a flanged hemi-spherical bowl, and North Lincolnshire grog-tempered ware. Other finds included animal bone, ceramic building material, glass (SF 5) and worked stone (SF 3; Plate 9). The glass appears to be from a blue/green bottle that was common during the later first to earlier third century and fits in with the date range provided by the pottery. The nature of the finds and inclusions suggests domestic activity in the close

vicinity. This ditch is the southern boundary ditch of the rectangular enclosure identified in the geophysical investigation. The western enclosure ditch was investigated in Trench 17 (17003/17004).

Gully 14006 (Fig. 8, S.37)

Gully 14006 was located to the north-west of Ditch 14004; the south-east edge of the gully and its fill having been cut by the ditch. The surviving element was 1.5m wide and 0.3m deep with a wide, flat-based U-shaped profile. It contained a single fill (14005) consisting of sub-angular limestone gravels (4-8mm) in an orange-brown silt-sand matrix thought to be a product of erosion from the cut edges and natural silting. No finds were recovered from this fill.

Trench 15 (Figs 2 and 9)

Trench 15 measured 50m by 2m and was orientated east to west, and targeted upon the ditches and interior of a possible enclosure, as well as extrapolated course of the three linear ditches targeted by Trench 11. Topsoil was removed to an average depth of 0.3m at which level the superficial geology was exposed – natural clays and silts with patches of weathered limestone, 54.28m aOD to the west, 56.89m aOD to the east. A single large linear feature was identified at the east end of the trench with subsequent excavation revealing a single large ditch with a potential trackway running across the surface. Further investigation around the supposed courses of the western anomaly (the tentative enclosure ditch) failed to locate it.

Ditch 15003 (Fig. 9, S.26/27)

Ditch 15003 was located 7m from the east end of the trench and orientated north-east to south-west. As the feature ran oblique to the line of the trench a staggered section was excavated to obtain two profiles at a tangent to the line of the feature. Together the two profiles recorded the true cross-section of the feature. The cut was 3m wide and 0.65m deep with a wide, irregular U-shaped profile. It contained a single fill (15002) consisting of sub-rounded igneous clast cobbles (128-256mm) and sub-angular limestone cobbles (64-128mm) in an orange-brown clay-sand matrix. A horse tooth and a single copper object (SF. 2) were recovered from this fill. The nature of the fill and inclusions suggest initial infilling with large stones (possibly from an eroding bank) coupled with natural erosion of the cut edges. It is not definite which ditch in Trench 11 is a continuation of this ditch, but it seems most likely to be 11003.

Track 15009 (Fig. 9, S. 26/27)

Track 15009 is a later re-use of the infilled Ditch 15003, probably as a hollow-way. This trackway is represented by a central erosion surface (15009; width 3m) on the surface of fill 15002 and two smaller parallel erosion surfaces immediately to the south-east (15004; width 1.15m) and north-west (15005; width 0.65m). All three erosion surfaces run north-east to south-west with tracks 15004 and 15005 acting on the surface of the superficial geology. Distinct cobbled layers (15006/15007) were observed in three areas set into 15002 at the erosion surface 15009 at depths ranging from 0.1-0.17m. These cobbles represent actions to

prolong the use of the track by adding a more stable metalling. A single fill covered all these contexts and consisted of sub-angular limestone gravels (8-128mm) within an orange-brown clay-silt (15008). This fill represents the abandonment of the tracks and subsequent infilling through natural accumulation of sediments.

Trench 16 (Fig. 2)

Trench 16 measured 10m by 5.7m and was orientated east to west. The trench was targeted to investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement immediately to the east of the main enclosure. Topsoil was removed to an average depth of 0.32m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural clay at 57.20m aOD. No archaeological features or deposits were revealed.

Trench 17 (Figs 2 and 10; Plate 7)

Trench 17 measured 49.9m by 2m and was orientated north to south. The trench was targeted to investigate an apparently blank area of the site, an extensive area of magnetic disturbance and the field boundary to the south. Topsoil was removed to an average depth of 0.36m at which level the superficial geology was exposed – a broken and weathered limestone with patches of natural sands and clay at 58.2-59.4m aOD. A single double-ditch and single large hollow were identified.

Ditches 17003 and 17004 (Fig. 10, S.28; Plate 7)

Ditch 17004 was located at the south end of the trench orientated east to west immediately to the north Ditch 17003 ran parallel. A 1m section was excavated through both ditches and full profiles obtained. The cut of Ditch 17003 was 0.9m wide and 0.23m deep with a narrow U-shaped profile. The cut of ditch 17004 was 1.5m wide and 0.75m deep and a narrow V-shaped profile with the south edge being 0.45m higher than the north. The primary fill (17005) consisted of sub-angular limestone gravel (32-64mm) in a dark yellow-brown silt-clay matrix and is a product of the erosion of the cut edges and natural silting. The secondary fill of Ditch 17004 (17006) is also the primary fill of Ditch 17005 and consisted of sub-angular limestone gravels and cobbles (32-256mm) and sub-rounded igneous clast gravel (2-4mm) within red-brown silt-clay matrix. The form of these two fills suggest that both ditches were open at the same time and that fill 17006 resulted from the erosion of material from the south; the size and quantity of the inclusions suggest the erosion of a bank deposit. Two fragments of abraded neck sherds from a white slipped Ebor flagon, dating to the late first to second century were recovered from fill 17005. No pottery was found within fill 17006 but a fragment of cattle humerus was recovered. This ditch is the southern boundary ditch identified by geophysical investigation and further identified in Trench 14 as Ditch 14004.

Hollow 17007 (Fig 10)

Hollow 17007 was located immediately to the north of Ditch 17003. A 1m section was excavated and a full profile obtained. The cut was 5.25m wide and 0.44m deep with a long,

irregular based, U-shaped profile. It contained a single fill (17008) consisting of limestone gravels and cobbles (16-128mm) in a red-brown clay-silt matrix. The nature of the cut and fill indicate a natural depression being in-filled through natural accumulation of eroded and water-based sediments.

Trench 18 (Figs 2 and 11)

Trench 18 measured 25m by 2m and was orientated east to west. The trench was targeted to upon a potential boundary ditch and enclosure in the north-western corner of the site. Topsoil was removed to an average depth of 0.5m at which level the superficial geology was exposed – glacial gravels with patches of clay at 61.5-61.7m aOD. A single ditch was identified running through the centre of the trench while further investigation around the supposed line of the enclosure revealed no further archaeological features nor deposits.

Ditch 18005 (Fig. 11, S.1)

Ditch 18005 was located 12.5m from the west end of the trench. A 1m section was excavated and a full profile obtained. The cut was 1.8m wide and 0.38m deep and possessed an irregular U-shaped profile. It contained a single fill (18004) consisting of 75% sub-angular limestone gravels and cobbles (32–256mm) in an orange-brown silt-sand matrix. A large quantity of animal bone (26 fragments) and a single worked flint blade was recovered from this fill. The blade is Neolithic to early Bronze Age date and suggests residual prehistoric activity on site. The environmental evidence produced charcoal remains that were identified as hazel and birch as well as limited amounts of spelt wheat. The ditch represents a former field boundary, but does not seem to have continued southwards to articulate with the large east-west southern ditch investigated in Trenches 14 and 17.

Trench 19 (Figs 2 and 12)

Trench 19 measured 25m by 2m and was orientated north-east to south-west. The trench was targeted to investigate an apparently blank area in the eastern part of the site which had been rendered blind to geophysical survey due to the effects of the gas pipeline. Topsoil was removed to an average depth of 0.33m at which level the superficial geology was exposed – glacial gravels with patches of clay. Remarkably, the stripping revealed two gullies (19001, 19014), four ditches (19003, 19005, 19011, 19016) and two pits (19007, 19009) were identified.

Gully 19001 (Fig. 12, S.4)

Gully 19001 was located at the west end of the trench and orientated north to south. A 1m section was excavated and a full profile obtained. The cut was 0.65m wide and 0.24m deep with a U-shaped profile. It contained a single fill (19002) consisting of sub-angular limestone gravels (8-32mm) in an orange-brown silt-sand matrix, resulting from erosion of the edges and natural silting. No finds were recovered.

Ditch 19003 (Fig. 12, S.13)

Ditch 19003 was located 4.5m from the west end of the trench and orientated north to south. A 1m section was excavated and a full profile obtained. The cut was 0.86m wide and 0.45m deep with a U-shaped profile. It contained a single fill (19004) consisting of sub-angular limestone gravels (8-64mm) in an orange-brown silt-sand matrix, resulting from erosion of the edges and natural silting. A single hand made pottery fragment was recovered.

Ditch 19005 (Fig. 12, S.3)

Ditch 19005 was located 3.75m from the west end of the trench and orientated north to south, running parallel and 0.1m to the west of Ditch 19003. A 1m section was excavated and a full profile obtained. The cut was 1.94m wide and 0.25m deep with a U-shaped profile. It contained a single fill (19006) consisting of sub-angular limestone gravels (8-64mm) in an orange-brown silt-sand matrix, probably resulting from erosion of the edges and natural silting. A single retouched flint flake was recovered from the environmental sample.

Pit 19007 (Fig. 12, S.6)

Pit 19007 was located near to the southern trench edge, 1m to the west of Ditch 19003. The pit cut was 0.7m long by 0.6m wide and 0.17m deep exhibiting a broad U-shaped profile. It contained a single fill (19008) consisting of sub-angular limestone gravels (8-64mm) and sub-rounded igneous clasts in an orange-brown silt-sand matrix. No finds were recovered from the pit fill. The upper part of the eastern edge of pit 19007 had been cut by Pit 19009.

Pit 19009 (Fig. 12, S.7)

Pit 19009 was located near to the southern trench edge and truncated Pit 19007 eastern edge. The pit cut was 0.85m long by 0.5m wide and 0.14m deep exhibiting a broad U-shaped profile. It contained a single fill (19010) consisting of 40% charcoal within a black-brown silt-clay matrix. A near complete sheep skeleton which may indicate discard of either an unwanted carcass or the deliberate deposition.. The nature of the fill and finds suggest this pit functioned as a waste pit for domestic refuse and the remains of a fire. No *in situ* burning was observed.

Ditch 19011 (Fig12, S.12)

Ditch 19011 was located 9.45m from the east end of the trench and orientated north to south. The cut was revealed to be the northern terminal end of a ditch, 1.65m wide and 0.48m deep with a visible length of 0.55m and a U-shaped profile. The primary fill (19012) consisted of sub-angular limestone gravels (4-16mm) in an orange-brown silt-sand matrix, resulting from erosion of the edges and natural silting. Eight fragments of animal bone were recovered from this fill one of which showed indications of being gnawed. The secondary fill consisted of sub-angular limestone gravels (4-64mm) in a dark brown clay-sand matrix. The nature of the fill suggest accumulation resulting from erosion of the edges and natural silting. A single sherd of Romano-British pottery identified as North Lincolnshire grog-tempered ware, with a date range of late first to second century was recovered from the secondary fill.

Gully 19014 (Fig. 12, S.13)

Gully 19014 was located to the east of Ditch 19006; the west edge of the gully and its fill having been truncated by Ditch 19016. The surviving cut was 0.5m wide and 0.38m deep with a visible length of 0.9m and a flat-based U-shaped profile. This cut represents the southern terminal of a north to south orientated ditch. It contained a single fill (19015) consisting of sub-angular limestone gravels (4-8mm) in an orange-brown silt-sand matrix. This fill is a product of erosion from the cut edges and natural silting; no finds were recovered.

Ditch 19016 (Fig. 12, S. 13)

Ditch 19016 was located 9.45m from the east end of the trench and orientated north to south. The cut was revealed to be the southern terminal end of a ditch and truncated the west edge of the earlier Gully 19014. The cut was 0.9m wide and 0.43m deep with a visible length of 0.9m and a U-shaped profile. The primary fill (19017) consisted of sub-angular limestone gravels (4-8mm) in a yellow-brown silt-clay matrix. One fragment of animal bone was recovered from this fill. The secondary fill (19018) consisted of sub-angular limestone and sub-rounded igneous clast gravels and cobbles (8-128mm) within a dark orange-brown sand-silt and is the product of natural erosion and infilling.

Ditches 19011 and 19016 and Gully 19014 all represent feature termini along the same north to south axis. Gully 19014 is recorded as being truncated by Ditch 19016 but no stratigraphic relationships existed between Ditch 19011 and Gully 19014/Ditch 19016.

Trench 20 (Figs 2 and 13)

Trench 20 measured 29m by 2m and was orientated east to west. The trench was targeted to investigate a potential boundary ditch and enclosure in the south-eastern corner of the site. Topsoil was removed to an average depth of 0.33m at which level the superficial geology was exposed – glacial gravels with patches of clay at 61.3-61.5m aOD. A single ditch was identified corresponding to the results of the geophysical investigations.

Ditch 20004 (Fig. 13, S.14)

Ditch 20004 was located 3m from the east end of the trench. A 1m section was excavated and a full profile obtained. The cut was 3.15m wide and 0.75m deep with an irregular U-shaped profile. It contained a single fill (20003) consisting of sub-angular limestone gravels (32-64), cobbles (64-256mm) and boulders in an orange-brown silt-sand matrix. Animal bone was recovered from this fill. The ditch may form the western side of a small enclosure.

Table 2. Trench Summary

Trench	Dimensions (m)	Topsoil (m)	Natural	Archaeology	Finds	Interpretation
1	26.5 by 2.1	0.32	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
2	24.9 by 2.1	0.3	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
3	25 by 2	0.34	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
4	49.7 by 2	0.36	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
5	25.1 by 2	0.34	Broken and weathered limestone with patches of natural clay	Two ditches; [5002], [5004]	RB pottery from primary fill (5003) of ditch 5002	Minor field boundaries
6	25.2 by 2	0.42	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
7	10.4 by 5.2	0.34	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
8	10 by 5.2	0.35	Natural clays and silts with patches of weathered limestone	No archaeology	No finds	-

Trench	Dimensions (m)	Topsoil (m)	Natural	Archaeology	Findings	Interpretation
9	50.2 by 3.9	0.4	Weathered limestone with patches of natural clay	Seven ditches; [9003], [9005], [9010], [9014], [9017], [9023], [9025]. Two hollows; [9007], [9027]. One pit; [9016]	RB pottery from primary fill (9002) of ditch 9003; RB and prehistoric pottery and animal bone from primary fill (9004) of ditch 9003; Late Prehistoric pottery and animal bone from primary fill (9006) of ditch 9007; Late Prehistoric pottery from secondary fill (9012) of ditch 9014	Main concentration of settlement activity including boundary ditch and enclosures
10	26 by 2	0.35	Natural clays and silts with patches of weathered limestone	One ditch [10003]	No finds	Minor field boundary
11	25.7 by 2	0.4	Natural clays and silts with patches of weathered limestone	Five ditches; [11003], [11010], [11012], [11015], [11016]	Animal bone from fill (11007) of ditch 11003; skeleton 11001 within fill (11006) of ditch 11003; RB pottery from secondary fill (11014) of ditch 11010	Major boundary ditches representing the northern extent of settlement
12	9.6 by 5.2	0.36	Natural clays and silts with patches of weathered limestone	No archaeology	No finds	-
13	25 by 4	0.4	Broken and weathered limestone with patches of natural sands and clay	One ditch [13008]; two gullies [13003], [13014]; one pit [13005]	Partial quern stone and pottery from only fill (13002) of gully 13003	Boundary ditch representing southern extent of settlement
14	25.2 by 4	0.4	Broken and weathered limestone with patches of natural sands and clay	One ditch [14004]; one gully [14006]	RB Pottery, animal bone, ceramic building material, glass and worked stone from secondary fill (14002) of ditch 14004	Enclosure system and area of domestic activity

Trench	Dimensions (m)	Topsoil (m)	Natural	Archaeology	Finds	Interpretation
15	50 by 2	0.3	Natural clays and silts with patches of weathered limestone	Trackway, with a central hollow [15009] and two outer ruts [15004], [15005]; one ditch [15003]	Animal bone and copper object from fill (15002) of ditch 15003; burnt wood from layer 15008	Major boundary ditch with later reuse as trackway
16	10 by 5.7	0.32	Broken and weathered limestone with patches of natural clay	No archaeology	No finds	-
17	49.9 by 2	0.36	Broken and weathered limestone with patches of natural clay	Two ditches, [17003], [17004]; one hollow [17007]	RB Pottery from fill (17005) of ditch 17004; animal bone from fill (17006) of ditch 17003	Boundary ditch representing southern extent of settlement
18	25 by 2	0.36	Glacial gravels with patches of clay	One ditch [18005]	Animal bone, worked flint and charcoal from fill (18004) of ditch 18005	Partial enclosure system
19	25 by 2	0.5	Glacial gravels with patches of clay	Two gullies [19001], [19014]; Four ditches [19003], [19005], [19011], [19016]; Two pits [19007], [19009]	Late Prehistoric pottery from fill (19004) of ditch 19003; animal bone from fill (19010) of pit 19009; animal bone from primary fill (19012) ditch 19011; RB pottery from secondary fill (19013) of ditch 19011; animal bone from fill (19017) of ditch 19016	Minor field boundaries
20	29 by 2	0.33	Glacial gravels with patches of clay	One ditch [20004]	Animal bone from fill (20003) of ditch 20004	Partial enclosure

6 Artefact Record

Late Prehistoric Pottery by Chris Cumberpatch

Introduction

The late prehistoric pottery assemblage from Jackdaw Crag Quarry, consists of four sherds of hand-made pottery including one base and one rim sherd. The details are summarised in the catalogue below.

Catalogue

- 1 The base of a jar in a dark brown fabric (155g), vesicular internally with soft white calcareous inclusions (chalk or soft limestone) visible in cross section and on the external surfaces. A small number of long voids, apparently the traces of organic temper, were also visible in cross section. *Trench 9; Context 9004*
- 2 A small section of the wedge-shaped rim of a globular jar (12g) in a fine black fabric with brown internal and external margins. The sherd contains moderate quantities of sub-angular quartz up to 1mm with occasional larger grains. The rim form appears to be similar to the wedge-rimmed globular jars defined by Rigby (2004: Figure 7, 40) and which she has dated to the period between *c.100BC* and *c.100AD*. *Trench 9; Context 9006*
- 3 A featureless body sherd (7g) in a coarsely tempered fabric containing large angular calcite grains up to 3mm but often finer. The sherd retains a carbon deposit on the external face. *Trench 9; Context 9012*
- 4 A small, roughly circular sherd (3g), possibly a small pot disc, in a quartz tempered fabric with sub-angular quartz grains up to 1.5mm but mainly finer *Trench 19 Context; 19004*

Discussion

The pottery assemblage, although small in size, conformed to the profile established by a number of studies of later prehistoric and Roman period sites in north and eastern Yorkshire and adjacent areas. The basic division into wares tempered with quartz and non-soluble rock fragments (H2/ETW) and those tempered with calcite and calcareous rock fragments (H1/H4) has been discussed at length elsewhere (Rigby 2004, Didsbury 2009, Didsbury and Vince, in press) and can be seen to hold true for this small assemblage as it does for much larger ones. The problems of dating have also been discussed extensively by the same authors and the presence of a small fragment of rim (context 9006) with a form which allows it to be related to dated examples published by Rigby is exceptional in such a small group.

Conclusion

It is difficult to draw any conclusions from such a small group of sherds, especially when recovered from a mere 2.3% sample of the site. It is to be hoped that future work on the site

will examine a much larger area in greater detail with a view to recovering larger stratified groups of pottery from features on the site.

Romano-British Pottery by Ruth Leary

Fift-five sherds of Romano-British pottery were submitted for identification and analysis with a further two sherds from a stamped mortarium referred to Kay Hartley. The assemblage was of Hadrianic-early Antonine date, *c.* AD120-160 with little to suggest a wider date range than that. The vessels present comprised at least two flagons, a grey ware flanged bowl, a BB1 dish, sherds from two BB1 cooking jars, at least two B3 cooking jars and at least one G12 bead rim jar. In addition an Ebor tankard base was present. The reduced wares came from Dorset and the Hadrianic-early Antonine kilns at York (Swan 2002 fig. 7 no. 79, fig. 8 nos 83-4 and 87) or kilns working in that tradition with at least one jar from industries based around the Humber/North Lincolnshire or the Trent Valley (Monaghan 1997, 899 G12 group and Monaghan 1993 no 2904). The source of the flanged bowl in 14002 is not known although a similar vessel was found in excavations at the Minster in York (Perrin 1995 fig. 137 no 176). The vessel types would be consistent with a rural settlement or roadside settlement with trading links to York. The Ebor tankard is an exotic vessel based on Continental types and is a form known to have made by potters serving the military at York (Swan 2002 fig. 8 no. 87-8).

Fabrics

Table 3. Detailed fabric description and quantities of wares

Fabric (Monaghan 1997 codes)	Description	Nos	G	Rim %	Rel % of nos	Rel % of G	Rel % of rim equivalents
BB1	Dorset BB1	28	220.2	10	50.9	17.9	11.9
E1	Ebor ware 1	1	68.6		1.8	5.6	0.0
W1	Ebor white slipped ware	4	33.3	15	7.3	2.7	17.9
G	Dark grey with brown/buff core. Hard, sandy feel and irregular fracture. Moderate, medium, rounded quartz and sparse red/brown siltstones. Similar to one of the G12 samples at York but not grog tempered	2	102.9	14	3.6	8.4	16.7
B3	Ebor burnished grey ware	16	751.5	39	29.1	61.2	46.4
B4	Grey ware with brown core	2	16.3		3.6	1.3	0.0
G12	North Lincolnshire grog-tempered ware. Dark grey with brown margins and grey core. Lumpy, leathery feel. Moderate. Medium, rounded quartz and sparse, coarse-medium, subangular grey inclusions (grog or clay pellets?) and rare vesicles platey-?shell	2	35	6	3.6	2.9	7.1
Total		55	1227.8	84	100.0	100.0	100.0

*The pottery***Trench 5**

Twenty-three sherds from a BB1 jar with acute lattice burnish came from 5003 and dates to c.AD120-200. Two sherds were slightly burnt.

Trench 9

Six sherds from an Ebor grey ware everted rim jar with acute lattice burnish in context 9002 is of early-mid second century type. A BB1 sherd from a vessel of similar date and type came from 9004.

Trench 11

Two very abraded white slipped Ebor 1 sherds from 110014 belonged to a flagon made in the early-mid second century at York. The rim was slightly scorched.

Trench 14

Context 14002 contained the largest group and this comprised sherds from a BB1 dish, a BB1 jar, a neckless everted rim jar with acute lattice burnish copying BB1 types of Hadrianic-early Antonine date, an Ebor tankard of the same date, a flanged hemi-spherical bowl of late first to early second century date, a G12 flattened bead rim jar of the same date and two grey ware bodysherds of unknown form and date. A date in the Hadrianic-early Antonine period (mid 2nd century) is indicated.

Trench 17

Two abraded neck sherds from a white-slipped Ebor flagon dating from the late first to second century. The sherds are undiagnostic precluding close dating.

Trench 19

One G12 bodysherd. This ware dates to the late first to early second century.

Mortaria by Kay Hartley (interim report)

Three bodysherds of mortaria were recovered from the fill of Gully 13003, within the rectangular enclosure in the southern central part of the site. Only one of the sherds is stamped. The material appears to represent the output of a previously undocumented ?local potter, operating in the hadrianic period, probably between AD 120-140, and certainly not later.

Flint by Phil Weston

Three flint artefacts were recovered during the excavation. As this small assemblage is derived from late prehistoric and Romano-British contexts it is undoubtedly residual. Plano-convex knives (no. 1) are often associated with Food Vessels and Beakers suggesting previous activity of later Neolithic to early Bronze Age date on site.

Catalogue

- 1 Plano-convex knife (48mm by 20mm). Butt has been removed through retouch. Bulb of percussion still apparent on ventral face. Mottled mid-to-light grey, some patination, opaque. Invasively retouched over entire dorsal face. Tertiary. Distal end is missing suggesting it may have broken at the point at which it was hafted. *Trench 18; Context 18004*
- 2 Tiny retouch flake (4.5mm by 3mm.) Mid grey, opaque. *Trench 19; Context 19006, Environmental sample 6*
- 3 Flake. Unprepared butt. Mottled light grey with some patination. Functional wear on left lateral side, possible abrupt retouch on distal end. Secondary. Three negative scars on the dorsal face indicating the piece was struck from a short, stubby flake core. *Context unstratified*

Small Finds by Hilary Cool

Of the three items found, only one (no. 2) can be dated independently. It consists of three small fragments which can plausibly be interpreted as coming from a blue/green bottle of the type very common during the later first to earlier third centuries (Price and Cottam 1998, 191-200).

The two metal items are not independently dateable, though it may be noted that the iron terminal no. 1 is a substantial piece of metal that typologically does not come from any regularly encountered late Iron age or Roman types. Though the surfaces are corroded, it is still recognisable without X-radiography and it may be doubted that it is of any great antiquity, in keeping with its provenance.

Catalogue

- 1 Terminal. Iron. Massive circular slightly domed head with short square-sectioned shank behind. Head diameter 52mm. shank section 9mm. *Trench 9; context 9021; SF.4*
- 2 Bottle; three neck fragments. Blue/green. Cylindrical neck, one retaining junction with shoulder. *Trench 14; context 14002; SF 5.*
- 3 Bar. Copper ally. Square-sectioned central section flattening and expanding slightly to chipped spatulate terminals. Function unknown. Length 36mm, section (centre) 3.5mm. *Trench 15; context 15002; SF. 2.*

Stone Objects by John Cruse with lithology by Geoff Gaunt

Two stone objects were recovered during the trial trenching. One is clearly a fragment of a flat disc quern stone, a small area of the non-grinding surface of which had seen re-use for blade sharpening (no.1), as revealed by the smoother finish and the evidence for a sharpening

lubricant in the form of a dark brown accretion. The other item is more enigmatic, appearing to be a fragment of a shallow stone trough, though its lithology might indicate a natural form (no.2).

Catalogue

- 1 Approximately 45% of a flat quernstone. It would appear to the top portion of a disc quern common from Romano-British sites. Lithology: Sandstone, pale grey (pale brown at surface), fine to, less common, medium grained, fairly well compacted, with sparse muscovite. Almost certainly Coal Measures, although a source in a fine-grained in the Millstone Grit cannot be precluded. *Trench 13; context 13002; SF 1*
- 2 Possible base of a shallow stone trough with part of a side forming a curving right angle. The base is undressed on the outside suggesting that it was not meant to be seen, and possibly set into the ground. The stone appears to be very worn, or weathered, with all the breaks and fractures appearing to be very clean. The exact function is unclear. It is just conceivable that it was part base of a trough or perhaps a culvert/water channel. However, the lithology suggest it maybe a natural rock. Lithology: Uncertain, pale to, less common, dark grey, very fine grained / finely crystalline, hard (6 to 7 on Moh's scale), the darker areas probably being extremely fine grained / crystalline, with scattered minute voids. Probably chert. If the object is made of chert it is probably erratic and not an artefact, as it would be almost impossible to produce any artefact except an axe head from chert. *Trench14; context 14002; SF 3*

7 Environmental Record

Human Bone by Rebecca Venn and Malin Holst

A single human skeleton was discovered within Trench 11 the skeleton (SK 1) was located within ditch 11003. A burial pit was not discerned, although the fill around the burial (11006) was distinct, consisting of some very large stones sub-angular limestone gravels in dark yellow-brown clay-silt, the burial was appears to have subsequently been covered with boulders. The skeleton is radiocarbon dated to the pre-Roman Iron Age, 400-200 cal. BC (SUERC-29388; Table 6). The Skelton was analysed in detail, assessing the preservation and completeness, as well as determining the age, sex and stature of the individual. Appendix 5 forms a detailed osteological and palaeopathological catalogue.

Table 4. Summary of archaeological information of complete skeletons

Skeleton No.	Position	Orientation	Artefacts	Feature Type	Date
1	Supine with lower limbs flexed and lower left arm flexed	Southwest-northeast	None	Ditch	Presumed Iron Age/ Romano-British

Osteological Analysis

Preservation

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition. Preservation of human skeletal remains is assessed subjectively, depending upon the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

Preservation was assessed using a grading system of five categories: very poor, poor, moderate, good and excellent. Excellent preservation implied no bone surface erosion and very few or no breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation.

The skeleton is poorly preserved and was 45% complete. The surface of the bones is heavily eroded and chalky in texture. Post-mortem damage caused numerous impressions on the bone surface, probably the result of root damage and there were also indicators of rodent damage. The majority of the post-cranial bones were missing the joints and many of the long bone shafts were fragmented. This is probably due to damage from the stones that were placed above the skeleton.

Table 5. Summary of osteological and palaeopathological results

Skeleton No	Preservation	Completeness	Age	Sex	Stature (cm)	Dental Pathology	Pathology
1	Poor	45%	35-45	M	N/A	Calculus, enamel hypoplasia, caries, wear, periodontal disease and chipping	Aplasia of the right side of the first cervical vertebra with associated compensatory growth on the left side. Porosity on two of the thoracic vertebrae and one lumbar vertebra. Slight porosity on the right acetabulum. Pronounced muscle attachments on the right femur and on the left clavicle.

Assessment of Age

Age was determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). In adults, age estimation largely relies on the presence of the pelvis and ribs and uses different stages of bone development and degeneration in order to calculate the age of an individual. It can be supplemented through examination of dental wear. As a result of the poor preservation of the skeleton the majority of bones used for

skeletal ageing were absent. Analysis of the dental wear indicated an age between 36 and 45 years (Brothwell 1981).

Sex Determination

Sex determination was carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood.

The skull of the skeleton showed uniform male traits. The mandible and supra-orbital ridge were particularly male in form. The angle of the sciatic notch and the lack of preauricular sulcus also indicated that the individual was a male. Finally, the left femoral head width was large which further indicated that the remains were those of a male (Bass 1987; Mays and Cox 2000).

Metric Analysis

Stature depends on two main factors, heredity and environment; it can also fluctuate between chronological periods. Stature can only be established in skeletons if at least one complete and fully fused long bone is present, but preferably using the combined femur and tibia. The bone was measured on an osteometric board for stature calculations using a regression formula developed upon individuals of known stature (Trotter 1970). The preservation and completeness of the skeleton were such that no long bones were complete, meaning that it was not possible to calculate stature.

Measurements of the femora and tibiae are used to calculate the shape of the shafts (Bass 1987). In femora this is termed the *meric* index, and in tibiae it is the *cnemic* index. The platymeric index of the left femur was 86.2, which indicated that the femur was platymeric, or broad or flat (Bass 1987).

Non-Metric Traits

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are believed to suggest hereditary affiliation between skeletons (Saunders 1989). The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Trinkhaus 1978). A total of thirty cranial (skull) and thirty post-cranial (bones of the body and limbs) non-metric traits were selected from the osteological literature (Buikstra and Ubelaker 1994, Finnegan 1978, Berry and Berry 1967) and recorded.

The cranium was fragmentary with the entire skull base absent as well as the maxilla, zygomatic bones and large areas of the frontal and left parietal bones missing. This hindered analysis of cranial non-metric traits, although two traits were observed. These were a *parietal foramen* (an additional small hole towards the back of the head) and a *metopic suture* (an

additional suture between the eye orbits, running up through the supra-orbital ridge) (Buikstra and Ubelaker 1994).

There were no post-cranial non-metric traits observed in the individual.

Conclusions from the Osteological Analysis

Analysis of the skeleton from Jackdaw Crag Quarry indicated that the individual was a male of between 36 and 45 years of age at death. He had limited non-metric traits and those that were present were observed in the skull.

Pathological Analysis

Pathological conditions (disease) can manifest themselves on the skeleton, especially when these are chronic conditions or the result of trauma to the bone. The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles. All bones were examined macroscopically for evidence of pathological changes.

Congenital Conditions

The embryological development of an individual can be affected by heredity and the environment, leading to the development of a congenital defect or anomaly (Barnes 1994). The most severe defects are not usually seen in archaeological populations as affected babies are usually miscarried or stillborn, or die shortly after birth. However, less-severe developmental anomalies are frequently observed in archaeological populations, and in many cases the affected individual will not have been aware of their condition. The frequency with which these minor anomalies occur may provide information on the occurrence of the severe expressions of these defects in the population concerned (*ibid*). The prevalence of minor anomalies may also inform on maternal health, as poor maternal health can lead to increased frequencies of developmental anomalies (Sture 2001).

The first cervical vertebra is known as the 'atlas' vertebra, as the skull rests upon it. In this individual, the right side of the atlas vertebra displayed aplasia (incomplete growth), while the left side displayed extended growth as a compensation mechanism (Barnes 1994, 267). It is thought that this deformity would have caused misalignment, resulting in discomfort for the individual (*ibid*).

Joint Disease

The most common type of joint disease observed tends to be degenerative joint disease (DJD). DJD is characterised by both bone formation (osteophytes) and bone resorption (porosity) at and around the articular surfaces of the joints, which can cause great discomfort and disability (Rogers 2000).

The superior right facet of one thoracic vertebra and the right inferior facet of another thoracic vertebra showed slight osteophyte formation and moderate porosity. The left inferior facet of the same vertebra had slight porosity as did a superior facet of a left lumbar vertebra. This suggests mild degenerative joint disease of the lower spine.

Miscellaneous

The right femur showed marked muscle attachments for the hamstrings on the *linea aspera*. There was also a marked muscle attachment at the site of *deltoid* on the left clavicle (Stone and Stone 1997). Large muscle attachments indicate heavy use of the muscle, which is sometimes the result of occupation, although this cannot be securely established (Waldron 2001).

Conclusions from Pathological Analysis

The individual had a small number of pathological lesions. There was a rare congenital deformity in the form of aplasia of the first cervical vertebra as well as slight degenerative joint disease on several vertebral facets. Finally, there were pronounced muscle attachments observed at the site of the hamstrings on the right femur as well as at the attachment site of *deltoid* on the left clavicle, suggesting muscular strain at these muscles.

Dental Health

Analysis of the teeth from archaeological populations provides vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions.

All sixteen tooth positions of the mandible (lower jaw) were present, although the maxilla (upper jaw) was absent. The left second mandibular molar was lost post-mortem while the rest of the mandibular teeth were recovered. All of the left maxillary teeth were present as well as the incisors and first pre-molar of the right maxilla. In total, 26 teeth were present.

Dental Calculus

Calculus (mineralised dental plaque) is commonly observed in archaeological populations whose dental hygiene was not as rigorous as it is today. If plaque is not removed from the teeth effectively (or on a regular basis) then these plaque deposits mineralise and form concretions of calculus on the tooth crowns or roots, along the line of the gums (Hillson 1996).

Calculus was present on 21 of the 26 (80.8 %) surviving teeth. A total of seventeen of the 26 teeth had flecks or slight deposits of calculus (65.4%) while 15.3% of teeth had moderate or heavy deposits. The mandibular teeth displayed the most severe calculus and in all but one case of the teeth with calculus, it was present on both the buccal (cheek) side and lingual (tongue) side of the teeth. In addition, in one case, there was calculus on the buccal and lingual sides as well as the sides of the tooth in contact with neighbouring teeth.

A total of 43.3% of individuals from the Roman period display some level of calculus (Roberts and Cox 2003). As such, the 80.8% prevalence of calculus in this individual indicates relatively poor dental hygiene (Roberts and Cox 2005), something which is compounded by the presence of caries, as discussed below.

Dental Caries

Dental caries (tooth decay) forms when bacteria in the plaque metabolise sugars in the diet and produce acid, which eventually leads to the formation of a cavity in the tooth (Zero 1999). Simple sugars can be found naturally in fruits, vegetables, dried fruits and honey, as well as processed, refined sugar; since the latter three contain the most sucrose they are most cariogenic. Complex sugars are usually less cariogenic and are found in carbohydrates, such as cereals. However, processing carbohydrates, including grinding grains into fine powders or cooking them, will usually increase their cariogenicity (Moynihan 2003).

Two caries lesions were present on the teeth from this individual. Both were observed at the cemento-enamel junction (the area where the crown of the tooth meets the root) (Hillson 1996). The left second maxillary molar had slight caries while the left mandibular second pre-molar had moderate caries. It is common for caries to be present in adults due to the effect of diet and hygiene on the dentition over time and so it is unsurprising that the individual suffered from them (Roberts and Cox 2005).

The frequency of caries from the Roman period is 7.5% (Moynihan 2003). The skeleton from Jackdaw Crag Quarry displayed a very similar frequency of 7.7%. The caries were present at the area of the tooth which is the most common site for caries formation in individuals from the Roman period.

Dental Enamel Hypoplasia

Dental enamel hypoplasia (DEH) is the presence of lines, grooves or pits on the surface of the tooth crown, and occurs as a result of defective formation of tooth enamel during growth (Hillson 1996). Essentially, they represent a period when the crown formation is halted, and they are caused by periods of severe stress, such as episodes of malnutrition or disease, during the first seven years of childhood. Involvement of the deciduous (milk) teeth can indicate pre-natal stress (Lewis 2007). Trauma can also cause DEH formation, usually in single teeth.

There were three faint hypoplastic lines present on the left maxillary canine. The prevalence for dental enamel hypoplasia in the Roman period is 9.1% as calculated by Roberts and Cox (2003). The Jackdaw Crag Quarry prevalence was 3.8%, significantly lower than the average.

Periodontal Disease

The male individual suffered from moderate periodontal disease (receding gums) in the lower jaw. Periodontitis is caused by bacteria in the mouth, and is exacerbated by calculus which irritates the gums as well as caries which harbour large numbers of bacteria (Hillson 1996).

Dental Anomalies

A small amount of chipping was observed on the occlusal (biting surface) of the left second mandibular pre-molar. This was probably as a result of a hard impact on the tooth, either by accident or as the result of use of the tooth as a tool.

Dental Conclusions

The dentition was showed evidence for poor dental hygiene, indicated by the extensive calculus deposits on the majority of teeth, at a prevalence rate which was significantly higher than the Roman average. The two caries lesions support this conclusion, particularly as they were sited at the junction between the crown and the root, which is an area prone to the collection of bacteria and formation of plaque, although the caries rate in this male corresponded with the Roman average. Evidence for moderate periodontal disease on the mandible further suggests the individual had bad dental health. Moderate or severe wear on the biting surface of all of the teeth, as well as the chipping on one of the teeth indicate heavy use of the dentition, probably a result of the age of the individual as well as diet. Finally, the presence of dental enamel hypoplasia implies that the individual suffered some form of childhood stress either as a result of malnutrition or disease.

Mortuary Practice

The Jackdaw Crag skeleton was the only one found during trial excavation, although more burials may be present. The skeleton was found on the north-western edge of a ditch and had been covered by large boulders. The stones were on average 320mm in size and could have constituted a grave covering. The skeleton was aligned on a northeast- southwest axis in a supine position, while the legs were flexed to the left and the left lower arm was brought up to lie parallel to the upper arm. The flexed position of this individual is consistent with Iron Age burial practice (O'Brien 1999, 1) as opposed to later Roman extended burials (Hope 1999, 55).

Discussion and Summary

The skeletal analysis of a single skeleton from Jackdaw Crag Quarry showed that this was in very poor condition with severe surface erosion and post-depositional damage from rodents and plant roots. In addition, much of the skeleton was absent and those bones that were present tended to be missing the joints. This made analysis of the remains difficult, particularly with regards to calculating stature and identifying non-metric traits and pathologies. The skeleton has been determined to be of Iron Age date by radiocarbon dating.

The grave was aligned on a north-east to south-west axis and the skeleton's lower limbs were flexed at 90° to the left and the left lower arm flexed so that it lay flush with the upper arm. The entire skeleton was covered in large stones, possibly forming a grave covering.

The individual was a male of 36-45 years of age. He suffered from a developmental defect of the first cervical vertebra which caused the vertebra to have an abnormal shape and would have resulted in discomfort. He also suffered from slight spinal joint disease although this affected a limited number of vertebrae and was probably linked to his age. He also had extensive dental pathologies, a large number of which were the result of poor hygiene and diet. There was wear on all teeth and calculus on a large number of them. The presence of caries further indicates bad hygiene, as does the periodontal disease observed on the

mandible, although these pathologies would have also been linked to his age as well as other factors. Chipping of one of the mandibular teeth may be the result of stress put upon the weaker biting surface of the tooth. Dentition often becomes weaker at the surface over time as a result of the acid or sugar in the diet in conjunction with age, although diets in the Roman period tended to be low in sugar (Moore and Corbett 1973). It may indicate that he used the teeth as a tool, although if this were the case it would be expected that chipping would be observed on more than one tooth, and on the incisors and canines rather than a pre-molar. The three dental enamel hypoplasia lines indicate several periods of ill-health or under-nutrition in his childhood. There were no further indicators for childhood illness, either as porosity in the eye orbits or skull vault, although observation of these pathologies was hindered by the absence and bad preservation of the bones. Finally, the presence of pronounced muscle attachments on two of the bones indicates that the individual used those muscles a great deal, often in repetitive tasks. Muscle markers of this kind have been used to infer occupation, although they can also be the result of age, as stress on the muscle increases over time, as well as sex, as males are more prone to developing these than females (Weiss 2004, 232).

Radiocarbon dating

A single sample of human bone was submitted for radiocarbon dating at the Scottish Universities Environment Research Centre (SUERC). The sample was submitted in order to provide a secure date for the inhumation identified in ditch 11003, within Trench 11. The results is presented in Table 6

Table. 6 Radiocarbon dating results

Lab. Code	Context	Material	Radiocarbon Age BP	Cal. Age d1 (68.2%)	Cal. Age d2 (95.4%)	Delta ¹³ C rel. VPDB (‰)
SUERC-29388 (GU-21566)	11006	Human bone	2245±35	390-350 BC 300-230 BC 220-210 BC	400-340 BC 330-200 BC	-20.6

Animal Bone by Jane Richardson

In total, 294 animal bone fragments were recovered from both hand-excavated and sieved deposits (Table 7), although most of these (177) represent a single sheep skeleton. The data are presented by feature, although too few bones were retrieved to allow comparisons between them, particularly when bone zones (easily identifiable and non-reproducible parts) are considered. The assemblage falls well below the minimum reliable sample size of around 500 (with reference to a number of statistical parameters after Van der Veen and Fieller 1982, 296).

This material has been treated as a single 2nd-century AD assemblage, although the possibility of earlier prehistoric activity, as indicated by limited flint finds, and the Iron Age

human burial, is acknowledged. It should also be noted that much of the bone was recovered from features that contained no dateable artefacts.

Methodology

Bones were identified to taxa wherever possible, although lower-order categories were also used (e.g. sheep/goat, cattle-sized). As the assemblage was small, all fragments were recorded although identification of diagnostic element zones was also made.

For age-at-death data, epiphyseal fusion (after Silver 1969) and the eruption and wear of deciduous and permanent cheek teeth were considered. Dental eruption and wear were recorded using the letter codes of Grant (1982).

Bone condition, erosion and fragment size were recorded in order to assess bone preservation, while gnawing, burning and butchery marks were noted to determine bone treatment. Given the fragmented nature of the assemblage, and its poor condition, the recovery of biometrical data was not attempted, with the exception of a withers' height calculated for the sheep skeleton. No pathological bones were noted.

Results

The assemblage is of questionable value due to its small size, and the poor condition of the majority of the bone fragments. Most bones are porous, fragile and heavily eroded. The very low proportion of bones identified as diagnostic zones (19%) is a reflection of the highly fragmented nature of the assemblage.

Butchery marks were limited to a single cattle-sized long bone from ditch 19011, which displays a chop mark to the mid-shaft area. No gnawed bones were noted, although this might be a reflection of the poor state of the bone surfaces, and no burnt bones were recorded.

The bones recovered include cattle, horse and sheep bones predominantly from long bones, with a few loose teeth. The scatter of disarticulated fragments is likely to represent domestic refuse, although the near-complete sheep skeleton from pit 19009 indicates the discard of either an unwanted carcass or conversely the disposal of a 'structured' deposit imbued with particular meaning. All body parts are represented (axial skeleton including the head, fore and hind-limbs and feet) and a female around the age of three years is indicated by the dental wear and fusion data. An estimated greatest length from a metacarpal suggests the animal stood at c. 567mm at the shoulder. No evidence for butchery was noted.

Conclusions

Unfortunately the bone assemblage is too small for meaningful interpretation and any conclusions reached here should be treated with caution. Domestic refuse associated with food consumption is likely for a minority of the bones, although the disposal of a ewe in its prime represents very different discard. No further analysis on these bones is warranted.

Table 7. Animal bone fragments by feature (zone counts given in parentheses)

	Cattle	Horse	Sheep	Sheep/goat	Cattle-size	Sheep-size	Total
Ditch 9005	(2) 2				52		54
Hollow 9007						3	3
Ditch 11003	1						1
Ditch 14004					15		15
Ditch 15003		1					1
Ditch 17003	(1) 1						1
Ditch 18005					26		26
Pit 19009			(52) 177				177
Ditch 19011					2	6	8
Ditch 19016				1			1
Ditch 20004		1			5	1	7
Total	4	2	177	1	100	10	294

Carbonised Plant and Macrofossils and Charcoal by Diane Alldritt

Introduction

Twenty-four environmental sample flots were examined for carbonised plant macrofossils and charcoal. Six retents producing charred material and two charcoal spot samples were also analysed for identifiable remains. Environmental samples derived from nine trenches were recorded, all with Romano-British date. Samples were taken from a variety of features including ditches, pits and gullies together with occasional burnt and other layers, and from around Skeleton 11001.

Methodology

Bulk environmental samples were processed by ASWYAS using an Ankara style water flotation system (French 1971). The flots were dried prior to examination under a low powered binocular microscope. Charred material was fairly scarce and recovered in amounts from <2.5ml up to 10ml only, mostly tea-leaf sized charred detritus with occasional larger fragments of wood charcoal from 0.5cm to 2.5cm and cereal grain. Modern root fragments were present in amounts from <2.5cm up to 25ml and recovered from every sample. Modern seeds were also recorded, mostly in low numbers, apart from in trench 13, (13004), where a large cache of *Chenopodium album* (fat hen) was discovered. This probably reflects the modern seed bank present in the soil and as no significant carbonised remains were found in the same context should not be particular cause for concern. All identified plant remains including charcoal were removed and bagged separately by type.

Wood charcoal was examined using a high powered Vickers M10 metallurgical microscope at magnifications up to x200. The reference photographs of Schweingruber (1990) were

consulted for charcoal identification. Plant nomenclature utilised in the text follows Stace (1997) for all vascular plants apart from cereals, which follow Zohary and Hopf (2000).

Results

Results were divided by trench and presented in Table 8. All results are discussed below.

Trench 9

Three samples examined from Trench 9 were mostly barren of environmental material. Sample 25 (9009), which consisted of two bulk samples from Ditch 9010, was completely barren of identifiable charred remains, producing only modern detritus. Similarly Sample 28 (9015), from Pit 9016, contained modern seeds together with very small trace fragments of charred material, most likely decayed wood charcoal. Sample 29 (9021), taken from a burnt layer within hollow 9027, produced some modern contamination in the form of seeds and earthworm egg capsules and also contained a single piece of indeterminate charcoal. This fragment was possibly a root or immature twig but could not be identified due to poor preservation.

Trench 10

A single sample, 10 (100002), taken from Ditch 10003 in Trench 10, was barren of identifiable carbonised material, producing modern seeds only.

Trench 11

Four samples were examined from Trench 11. Sample 23 (11004), the primary fill of Ditch 11003, was sterile. Samples 22 (11006), 24 (11006) and 26 (11006), all from within and around the backfill of Skeleton 11001, all failed to produce any significant carbonised plant material. Samples 22 and 24 were both completely sterile, whilst Sample 26 (from the feet area) produced a few tiny slivers of charred detritus which is probably not significant given the presence of modern contamination throughout the three samples.

Trench 13

Three samples examined from Trench 13 produced very few carbonised remains. Sample 15 (13002), from Gully 13003, was the most productive with a single find of a charred rhizome together with two very poorly preserved indeterminate cereal grains. It is most likely, given the poor preservation and the presence of modern material, that these fragments are intrusive and reflect burning/cooking or other activity occurring in the vicinity. Sample 16 (13004), also from Gully 13003, contained a cache of modern seeds, consisting mainly of *Chenopodium album* (fat hen) and probably reflecting the local 'seed bank' naturally occurring in the soil. The retent from this sample produced a small amount of wood charcoal, which was all too small to identify, suggesting some carbonised material was arriving in the gully deposit from nearby activity.

Sample 20 (13009), the primary fill of Ditch 13008, was sterile of environmental material.

Trench 15

Two bulk samples and one charcoal spot sample were taken from Trench 15. Sample 13 (15002), from Ditch 15003, was barren of identifiable charred material, containing only trace fragments of carbonised detritus. Sample 14 (15008) taken from a layer was also quite barren apart from a small amount of modern material, however the spot sample from (15008) produced a large fragment of wood charcoal 2cm in size. This piece showed quite poor preservation but could be identified as *Corylus* (hazel) and probably originated as small branch or immature wood. It might be suitable for future dating but caution should be taken given the context in which it was found and its poor condition, as it is very likely residual.

Trench 17

Two samples from Trench 17 produced small amounts of carbonised material, providing tentative evidence for cereal processing activity occurring in the vicinity of the deposits, although it should be noted that the amounts found were on trace levels. Sample 17 (17004), from Ditch 17005, produced a very nicely preserved specimen of *Triticum aestivum* (bread wheat) cereal, the only example of bread wheat from the site as a whole. Sample 18 (17008) from a hollow (17007) contained some trace fragments of indeterminate wood charcoal together with two carbonised weeds namely *Plantago lanceolata* (ribwort plantain) and *Lithospermum arvense* (field gromwell). These are typical arable field weeds associated with ground disturbed for agriculture and may well have arrived at the site along with a wheat cereal crop. Both sets of remains from (17004) and (17008) provide tentative evidence for activities associated with an agricultural economy, such as the drying and processing of grain.

Trench 18

One bulk sample was examined from Trench 18, together with a charcoal spot sample taken from the same context. Sample 1 (18004), from Ditch 18005, produced the best preserved and most abundant quantities of wood charcoal recorded from the site as a whole. Both *Corylus* (hazel) and *Betula* (birch) were identified, with the hazel wood in particularly good condition. The sample also contained a single very good *Triticum spelta* (spelt wheat) grain suggesting a degree of agricultural activity in the vicinity, probably processing or cooking over a hearth place with the sweepings deposited in the ditch. The spot sample from context 18004 contained two pieces of hazel wood charcoal, with one fragment being roundwood. This measured 2cm in diameter and had nine growth rings, and was probably small branch wood. The remains suggested the use of light open woodland or woodland edges were being exploited for fuel, probably for use on domestic hearths and for cereal processing activities. Any of the fragments of hazel or birch (from 18004) would be suitable for future radiocarbon dating, but the optimum piece to use would be the roundwood.

Trench 19

Six samples were taken from a series of pit, gully and ditch deposits in Trench 19, and provided the largest concentration of carbonised plant remains recorded from the site as a whole.

Sample 3 (19010) contained a nicely preserved assemblage of carbonised cereal grain and weed seeds, and probably represents a dumped deposit of cereal processing waste or food remains from cooking activity. *Triticum* sp. (wheat) types and *Avena* sp. (oat) cereal grains were recorded in almost equal numbers from the deposit, indicating the use of both types for food, perhaps with oat also being processed for use as animal fodder. A number of the wheat grains were good enough to identify fully, with *Triticum spelta* (spelt wheat) found to be the main type present. A small quantity of *T. spelta* glume bases from the sample lent further, albeit tentative, weight to the argument for cereal processing occurring in the vicinity. Trace amounts of agricultural or disturbed ground weeds, namely *Fallopia convolvulus* (black bindweed) and *Stellaria media* (chickweed), may also reflect a cereal crop brought to the site for processing, whilst a single *Ranunculus* sp. (buttercup) in the deposit could suggest grassy fields more suited to oat agriculture were under cultivation.

Sample 2 (19008), from Pit 19007, contained trace fragments of indeterminate cereal grain, which were very poorly preserved, possibly intrusive remains scattered from the main concentration in Pit 19009.

Sample 4 (19002), from the fill of Gully 19001, was almost sterile apart from a single small part-fragment of cf. *Bromus* sp. (cf. bromes) a potential weed of grassy / agricultural land, although in this instance this is probably an intrusive inclusion.

The three ditch deposits sampled from this trench, Sample 5 (19004), from Ditch 19003, Sample 6 (19006), from Ditch 19005, and Sample 7, (19012), from the primary fill of Ditch 19011, were all sterile of ancient plant remains with only small trace quantities of decayed wood charcoal recorded. All three samples produced modern seeds indicating a small degree of modern contamination.

Trench 20

A single sample taken from Trench 20, Sample 9 (20003), from Ditch 20004, produced small trace quantities of charred plant material. This consisted of small fragments of wood charcoal, too small to identify, together with an indeterminate cereal grain and a small number of vegetative plant parts including a rhizome. The material could possibly reflect a deposit of hearth or fuel waste dumped into the ditch, particularly given that the rhizomes and other root-like material probably suggest the use of peat for fuel, although no actual peat fragments were recovered.

Discussion and Conclusion

The environmental samples from Jackdaw Crag Quarry produced, for the most part, very few carbonised plant remains or wood charcoal, with generally quite small trace amounts of plant material recorded from Trenches 13, 15, 17 and 20, but with nothing of significance from Trenches 9, 10, or 11. However, a fairly significant concentration of carbonised cereal grain together with other agricultural waste was recovered from pit deposit (19010) in Trench 19,

whilst in Trench 18 a ditch deposit (18004) contained nicely preserved fragments of wood charcoal.

Carbonised cereal grain from Trench 19 was identified as wheat, with spelt wheat probably the main cereal used for human consumption. A small amount of cereal chaff and weeds of agriculture from the same deposit provided tentative indication for processing of agricultural produce, perhaps the final stages of drying and then cooking, with hearth or perhaps possible oven waste being deposited in the pit. Oat was recorded in slightly larger amounts to wheat and could have had a fodder role. The combination of spelt wheat and oat is concurrent with an Iron Age/Romano-British date for the site.

Wood charcoal was confined mainly to Trench 18 and found to be limited to hazel and birch types. These suggested the use of open and scrub areas of forest for fuel. Scarce finds of rhizome fragments in Trenches 13 and 20 suggest possible cutting of peat areas for fuel. The hazel fragments from Trench 18 were well preserved and would be suitable for future radiocarbon dating, as would some of the cereal grain from Trench 19.

Occasional agricultural and grassland weed seeds were recorded, mostly from Trench 19. Non-marine mollusc shell was noted throughout the samples but particularly abundant in Trench 20 (see Carrott, below).

Table 8. Carbonised plant remains and charcoal

Jackdaw Crag Quarry,	Sample	25	28	29	10	22	23	24	26	15
	Context	9009	9015	9021	10002	11006	11004	11006	11006	13002
	Trench	9	9	9	10	11	11	11	11	13
	Feature	ditch 9010	pit 9016	layer	ditch 10003	Sk.11001	ditch 11003	Sk.11001	Sk.11001	gully 13003
	Total CV	<2.5ml	<2.5ml	10ml	<2.5ml	0	<2.5ml	0	<2.5ml	<2.5ml
	Modern	10ml	2.5ml	25ml	5ml	<2.5ml	<2.5ml	<2.5ml	<2.5ml	5ml
	Common name									
Carbonised Cereal Grain and Chaff										
<i>Avena</i> sp.	oat									
<i>Triticum spelta</i>	spelt wheat									
<i>Triticum aestivum</i>	bread wheat									
<i>Triticum</i> sp.	wheat									
	spelt wheat									
	chaff									
<i>Triticum spelta</i> glume bases										
Indeterminate cereal grain (+embryo)										2
Charcoal										
<i>Corylus</i>	hazel									
<i>Betula</i>	birch									
Indeterminate										
Carbonised Wild Resources										
Rhizomes										1
Indeterminate bud / vegetative parts										
Carbonised Weeds										
<i>Ranunculus</i> sp.	buttercups									
<i>Stellaria media</i>	chickweed									
<i>Fallopia convolvulus</i>	black bindweed									
<i>Lithospermum arvense</i>	field gromwell									
<i>Plantago lanceolata</i>	ribwort plantain									
cf. <i>Bromus</i> sp.	cf. bromes									
Other Remains										
Non-marine mollusc shells		5+	1	10+	2	2	5+		2	10+
Modern (non-carbonised) seeds		5+	10+	20+	5+	1			1	2
Modern straw										
Earthworm egg capsules										

Jackdaw Crag Quarry,	Sample	16	20	13	14	17	18
	Context	13004	13009	15002	15008	17004	17008
	Trench	13	13	15	15	17	17
	Feature		ditch 13008	ditch 15003	layer	ditch?	hollow 17007
	Total CV	gully 13003 5ml	<2.5ml	<2.5ml	<2.5ml	<2.5ml	2.5ml
	Modern	15ml	<2.5ml	5ml	15ml	<2.5ml	2.5ml
	Common name						
Carbonised Cereal Grain and Chaff							
<i>Avena</i> sp.	oat						
<i>Triticum spelta</i>	spelt wheat						
<i>Triticum aestivum</i>	bread wheat					1	
<i>Triticum</i> sp.	wheat						
	spelt wheat						
	chaff						
<i>Triticum spelta</i> glume bases							
Indeterminate cereal grain (+embryo)							
Charcoal							
<i>Corylus</i>	hazel					1 (0.61 g)	
<i>Betula</i>	birch						
Indeterminate							
Carbonised Wild Resources							
Rhizomes							
Indeterminate bud / vegetative parts							
Carbonised Weeds							
<i>Ranunculus</i> sp.	buttercups						
<i>Stellaria media</i>	chickweed						
<i>Fallopia convolvulus</i>	black bindweed						
<i>Lithospermum arvense</i>	field gromwell						1
<i>Plantago lanceolata</i>	ribwort plantain						1
cf. <i>Bromus</i> sp.	cf. bromes						
Other Remains							
Non-marine mollusc shells				10+	5+	20+	5+
Modern (non-carbonised) seeds		200+		2	10+	2	1
Modern straw		5+					
Earthworm egg capsules					1		

Molluscs by John Carrott

Introduction

Four assemblages of mollusc remains, recovered from bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992), from ditch fills encountered in Trenches 17, 19 and 20, were submitted to Palaeoecology Research Services Limited (PRS), Kingston upon Hull, for an evaluation of their bioarchaeological potential.

Methods

The samples were sieved to 500 microns by the excavator and the resultant residues and washovers ('flots') dried.

The washovers from four of the samples were submitted to PRS for evaluation of the mollusc assemblages present. Each of the assemblages was examined and individual remains were identified as closely as possible, within the constraints of an evaluation, with reference to published works (chief sources: Cameron 2003; Cameron and Redfern 1976; Ellis 1969; Kerney 1999; Kerney and Cameron 1979). Nomenclature follows Kerney (1999).

The numbers of individuals present were recorded semi-quantitatively on a five-point scale: f – few (up to 3 individuals); s – some (4 to 20 individuals); m – many (21 to 50 individuals); v – very many (50 to 200 individuals); v+ – more than very many (more than 200 individuals). The same scale was used to record estimates of the numbers of unidentified shell fragments. Occasionally, when only small numbers of individuals were noted, counts of minimum numbers of individuals were recorded; usually determined by numbers of shell apices, but in cases where numbers of large (and diagnostic) portions of the shell other than the apex were more readily and reliably identified these were used instead.

During recording definite species level identifications were sometimes prevented by encrusted sediment obscuring the surfaces or particular diagnostic features (e.g. within the mouth of the shell).

The burrowing land snail *Cecilioides acicula* is not considered in the discussion of the ecological implications of the assemblages as it is most likely intrusive; this species may burrow to depths of as much as two metres.

Results

The assemblages were all from ditch fills thought to be of Late Iron Age/Romano-British date. Each of the washovers contained small to rather large assemblages of mollusc remains, with all of the identifiable shells being of terrestrial snails.

Remains likely or certain to be intrusive or contaminants were also present in the washovers; in the form of modern rootlet (and other plant material, including some seeds of orache/goosefoot (*Atriplex/Chenopodium*) and elder (*Sambucus nigra* L.) for example), and the burrowing land snail *Cecilioides acicula* (present in all except Context 20003) and other modern invertebrate (non-molluscan) remains (Contexts 19006 and 20003). Fine charred material (charcoal and

cinder, to 5 mm) was present in each of the deposits and Contexts 17005 and 20003 also contained a few charred seeds (unidentified); a little coal (to 2 mm) was noted in all except Context 17005.

Overall, the snail remains were only moderately well preserved, with many being eroded and/or fragmented to some degree and the shells of larger forms almost always incomplete; each assemblage contained a relatively high proportion of unidentified shell fragments.

Semi-quantitative records of the snail assemblages are presented in Table 9 in context number order.

Discussion and statement of potential

Three of the assemblages, from Contexts 17005, 19004 and 19006, were fairly small and of a similar 'mixed' character. Each of these contained remains of dry, open ground taxa such as *Vallonia* species, *Cochlicopa ?lubricella* and *Vertigo ?pygmaea*, probably with areas where the underlying rock was exposed in the vicinity of Trench 19 (*Pupilla muscorum* – recorded from Contexts 19004 and 19006). There were also small numbers of taxa indicative of damper areas (e.g. *Carychium tridentatum* – Contexts 17005 and 19006) and more substantial vegetative cover (*Punctum pygmaeum* – Context 19004, and *Clausilia bidentata* and probably *Discus rotundatus* – Contexts 17005 and 19006). Land snail assemblages of this 'mixed' character are regularly recorded from ditch fills of Iron Age/Romano-British date in the region where it appears that the features separated areas cleared for habitation or by grazing animals (*Pupilla muscorum* is regarded as "...typical of sheep-grazed chalk or limestone grassland..." – Kerney 1999, 103) from the more densely vegetated surroundings and that their fills accumulated taxa from both habitats. There was a suggestion that the immediate vicinity at the time of the formation of Context 19004 was predominantly of dry, open ground as taxa of such habitats were prevalent – notably *Vertigo ?pygmaea*, which is intolerant of shade, was numerous and there was also a single record of *Truncatellina cylindrica*, a now rare species typical of "...short, dry, calcareous grassland in sandy or stony ground, or at the base of rocks or old walls, among *Sedum*, *Thymus*, *Artemisia* or similar plants" (Kerney 1999, 89).

The fourth assemblage, from Context 20003, was much larger and more diverse. Although there was, again, a mix of both dry, open ground taxa and those of damper and/or more shaded conditions present, here there was a strong bias in favour of the latter. Remains of *Carychium tridentatum* were abundant (and there were perhaps lesser numbers of *C. minimum*) and there were also remains of *Punctum pygmaeum*, *Discus rotundatus*, *Trichia ?hispida* (found in damp, well-vegetated places in general) and, in particular, many *Acanthinula aculeata*, which is "...mainly of deciduous woodland...and typical of leaf litter and fallen timber in shady places" (Kerney 1999, 110). There was, therefore, a strong implication for woodland in the vicinity of Trench 20 at the time of the formation of Context 20003, although some open ground was also indicated by quite large numbers of *Vallonia* species and *Vertigo ?pygmaea*.

No freshwater or aquatic marginal mollusc taxa were recorded from the deposits, implying that none of the ditches held water.

Recommendations

Further study of these assemblages would allow quantification of the taxa and perhaps a more definitive identification of some of the molluscs present. It is unlikely that this would add greatly to the interpretation of past landscapes represented reported here, however, and, in the absence of more precise dating of the deposits, no further analysis is recommended.

Should a more refined chronology be obtainable (perhaps via radiocarbon dating of charred plant remains), then a detailed record of the assemblages could provide data useful to synthetic studies of the past environments of the area and/or period.

The evaluation has shown that interpretatively valuable assemblages of land snails have been preserved within at least some of the features at this site. Any future interventions in the vicinity should consider this and adopt an appropriate sampling strategy for the recovery of such assemblages, their subsequent assessment and, if appropriate, analysis.

Retention and disposal

All of the remains reported here should be retained as part of the physical archive of the site.

Archive

All material is currently stored by Palaeoecology Research Services (Unit 4, National Industrial Estate, Bontoft Avenue, Kingston upon Hull), pending return to the excavator, along with paper and electronic records pertaining to the work described here.

Table 9. Semi-quantitative records of snail taxa. Key: Iron Age/Romano-British; f – few (up to 3 individuals); s – some (4 to 20 individuals); m – many (21-50 individuals); v – very many (50-200 individuals); v+ – more than very many (201+ individuals). Where figures are shown these are counts of minimum numbers of individuals. Nomenclature and taxonomic order of presentation follows Kerney (1999).

Context	17005	19004	19006	20003
Sample	17	5	6	9
Context description	Fill of ditch 17004	Fill of ditch 19003	Fill of ditch 19005	Fill of ditch 20004
Trench	17	19	19	20
Period	IA/RB	IA/RB	IA/RB	IA/RB
<i>Carychium tridentatum</i> (Risso) (and <i>Carychium</i> sp.)	1	-	1	v+
<i>Carychium</i> sp?p. (possibly including <i>C. minimum</i> Müller)	2	-	-	v+
<i>Cochlicopa ?lubricella</i> (Porro)	-	s	-	m
<i>Cochlicopa</i> sp. (apices)	1	f	1	m
<i>Truncatellina cylindrica</i> (Férussac)	-	f	-	-
<i>Vertigo ?pygmaea</i> (Draparnaud)	-	m	f	m
<i>Vertigo</i> sp.	-	-	f	s
<i>Pupilla muscorum</i> (L.)	-	f	f	-
<i>Lauria cylindracea</i> (da Costa)	-	-	1	s
Pupillidae sp. apices	-	f	f	m
<i>Vallonia ?costata</i> (Müller)	f	-	-	s
<i>Vallonia ?excentrica</i> Sterki	f	s	s	v
<i>Acanthinula aculeata</i> (Müller)	-	-	-	m
<i>Punctum pygmaeum</i> (Draparnaud)	-	f	-	s
<i>Discus rotundatus</i> (Müller)	2	-	s	v
<i>Vitrea crystallina</i> (Müller) / <i>V. contracta</i> (Westerlund)	-	-	1	m
? <i>Aegopinella</i> sp.	-	-	1	f
? <i>Oxychilus</i> sp.	-	-	1	f
<i>Cecilioides acicula</i> (Müller)	f	m	m	-
<i>Clausilia bidentata</i> (Ström)	1	-	1	-
causilid fragment	-	-	1	-
<i>Trichia ?hispida</i> (L.)	s	-	-	m
<i>Cepaea ?nemoralis</i> (L.)	-	-	-	1
Unidentified land snail shell fragments	m	m	m	v

8 Discussion

Feature visibility

A high correlation was seen between the features identified during geophysical investigation and the features identified during the evaluation. As predicted by the geophysical investigation the majority of features lay in the central and southern part of the site, south of the large ditches identified in Trenches 11 and 15. Only a single predicted feature was not present that of the northern enclosure within the north-west end of Trench 15. Conversely, several archaeological features were identified within Trenches 5 and 19, in areas where either none had been detected, or where the geophysical survey results were masked by the effect of the high pressure gas pipe. No archaeological features were located in the north-western part of the site.

Evidence of settlement and domestic activity seems to be derived from enclosure ditches and features within the ditched enclosures. That settlement activity was enclosed was seemingly confirmed by the negative results for unenclosed activity from Trenches 7, 8, 12 and 16, situated around the main enclosure complex.

Chronology and Phasing

On the basis of the available dating evidence, and disregarding residual flint of early prehistoric date, archaeological activity on the site would seem to fall into two broad phases: the pre-Roman Iron Age and the Roman period of the late 1st-2nd century. There is no evidence for settlement activity having continued into the later Roman period.

Dating of the pre-Roman Iron Age activity is best provided by the radiocarbon date of 400-210 cal. BC for the burial within Trench 11. This burial was seemingly placed upon the primary fill of the trackway ditch here, which demonstrates that the trackway, and perhaps by implication the field system that articulates with it to the south, was established by the later Iron Age period. The enclosure appended to the north side of the trackway (Trench 15) may also have its origins in the pre-Roman Iron Age.

Pottery from the enclosure complex targeted by Trench 9 and features in Trench 19 have both produced a small amount of pre-Roman Iron Age hand-made pottery (dating generally to between c.100BC to 100AD) which might be indicative of small later Iron Age settlement areas within the early divided landscape. The Trench 9 enclosure may conceivably have been a field corner enclosure formed in the north-west angle between the principal field ditches. Ditched sub-division of the later pre-Roman Iron Age landscape is well attested, especially on the Magnesian Limestone, which seems to have been preferably exploited in the later prehistoric period due to the combination of good soils and good drainage (Roberts *et al.* 2010).

The circumstances of the Iron Age burial are intriguing. Burials cut into ditch fills, or lain within the bottoms of ditches, are well documented in the region (e.g. Richardson 2005;

Brown *et al.* 2007a), but the Jackdaw Crag example seems to have been lain within a part in-filled ditch and the body covered by large stones, the later fills then accumulating around it. No other examples of this sort of burial rite are known.

Together, the recovered pottery, and the glass bottle fragments, indicates that the ditched field system was maintained into the 2nd century, with activity persisting in the Trench 9 enclosure complex, as well as within an additional rectangular enclosure to the east of it, the position of which seems to reflect the pre-existing field boundary. The dating resolution provided by the pottery suggests an early second century date, with nearly all the pottery fitting into a narrow date range from *c.*AD120-160. The pottery would also suggest that there was continuity into the early Roman period within the activity area represented in Trench 19.

Environmental evidence

The evidence generally is indicative of an open landscape with peripheral scrub and woodland areas, which is to be expected if the economy of the sites represented was one of livestock management and arable farming. The animal bone assemblage is dominated by sheep-sized and cattle sized bones and it is almost certain that animal husbandry will have formed a major element of the site subsistence economy in both the pre-Roman and early Roman phases, as has been amply demonstrated at other rural sites in the region (e.g. Roberts *et al.* 2001; Brown *et al.* 2007a; 2007b; Wrathmell and Nicholson 1990). The analysis of the plant remains has shown that wheat and oats were being cultivated, although it is not possible to determine on what scale. Some of this crop may have been used for animal fodder, although the presence of part of a flat quern stone suggests that, by the Roman period at least, some of it was being ground for flour.

9 Conclusions

The evaluation of the proposed southern extension of Jackdaw Crag Quarry has revealed archaeological remains that broadly accord with the geophysical survey data and suggests exploitation of the landscape spanning a period incorporating the later Iron Age and the early-mid Roman period. Earlier prehistoric activity is represented by a small number of residual flint finds. The archaeological remains appears to be confined mainly to the south-eastern half of the site. The level of preservation appears to be relatively good, although predictably agricultural truncation appears to have damaged several features. The recovery of ecofacts, especially charcoal and carbonised seeds was fairly good but limited to discreet areas of the site, while in contrast the preservation of the animal and human bone was relatively poor across the entire site.

Overall, the archaeological evidence is suggestive of a pre-Roman Iron Age agricultural landscape with settlement/activity foci, that continued to be developed and exploited into the early to mid Roman period, but with little evidence for the adoption of Roman material culture. The absence for any late 2nd and 3rd century activity, a period when locally produced

Roman pottery in particular is very prominent in the archaeological record, would suggest that the settlement here had ceased to exist by that time.

The evaluation provided significant additional evidence to the settlement, agricultural economy and the nature of the landscape of the pre-Roman Iron Age of the Magnesian Limestone in North Yorkshire. The site has particular potential for investigating the Roman impact on native sites in the immediate hinterland of the Roman forts at Newton Kyme and York, as well as the large settlement and possible military installation at Tadcaster, and how that influence may have developed during the first century of Roman rule and the degree to which such sites were reliant upon or exploited by Roman markets. The site also offers some potential for furthering our knowledge of Iron Age burial practices, which in this region have proved to be both varied and enigmatic.

It is anticipated that further archaeological excavation work will be required in advance of any operations for mineral extraction in the quarry extension area. The nature and extent of this mitigation work will need to be detailed in a Written Scheme of Investigation, prepared in collaboration with the North Yorkshire County Council archaeologist advising the Planning Department.

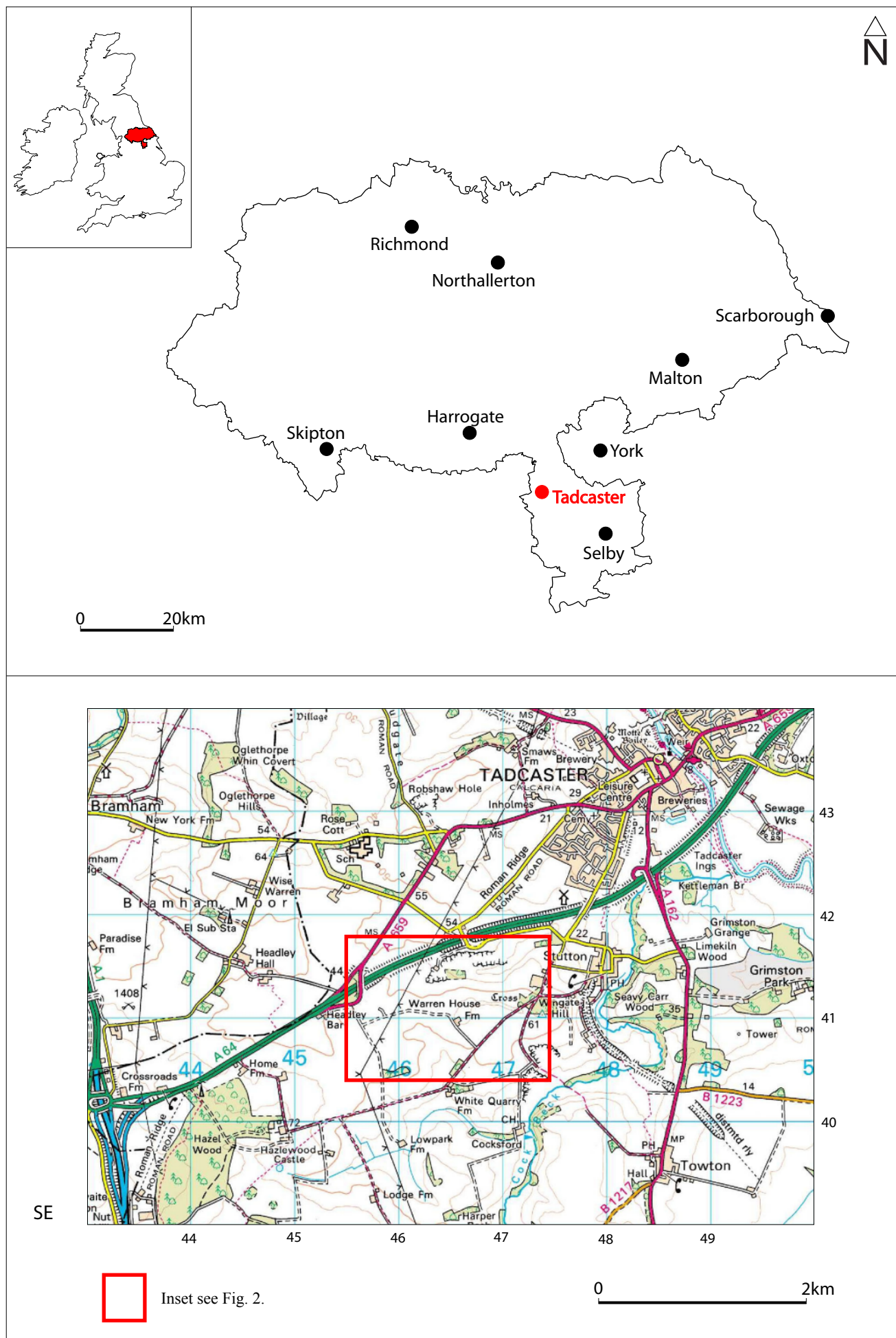


Fig. 1. Site location

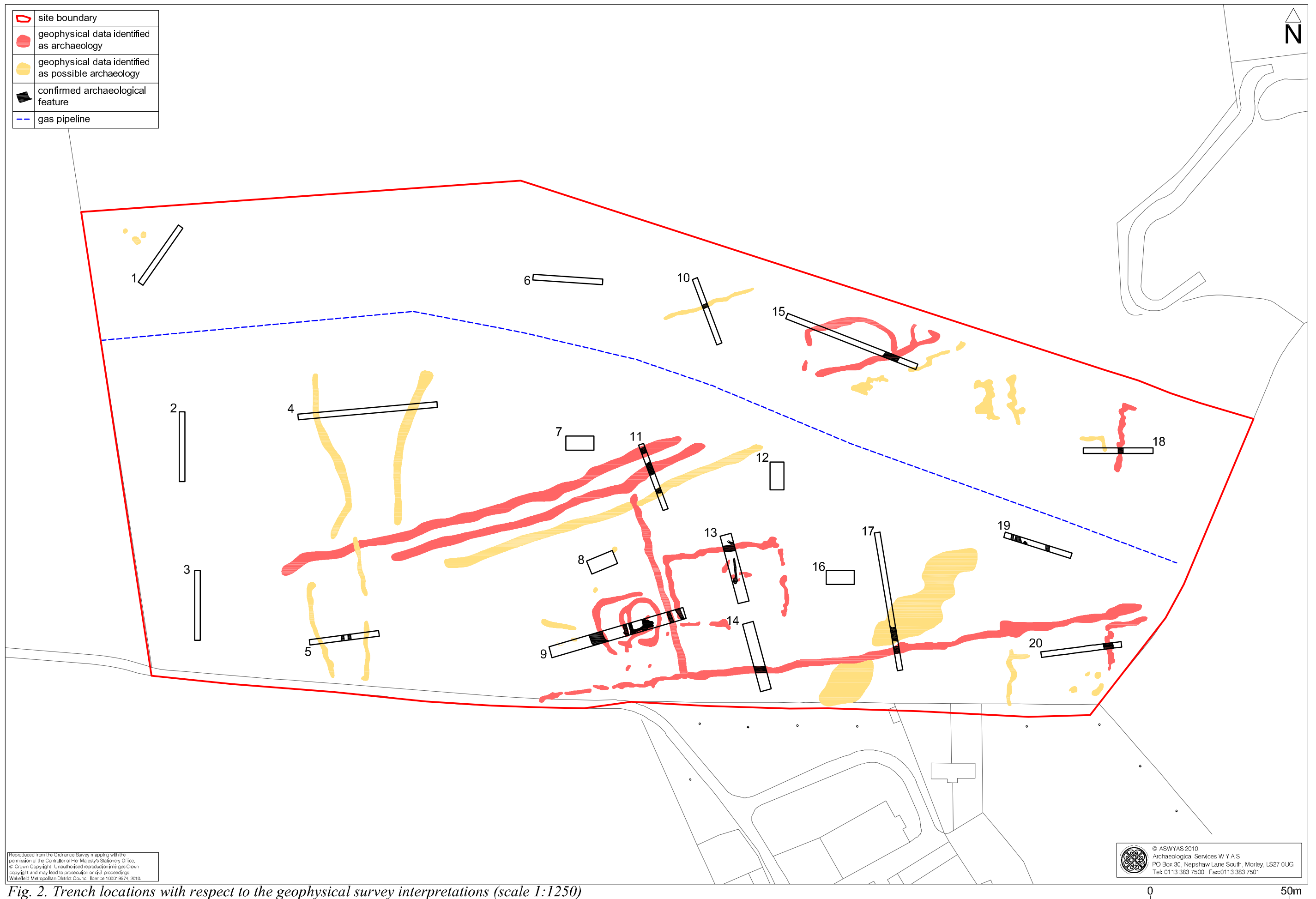


Fig. 2. Trench locations with respect to the geophysical survey interpretations (scale 1:1250)



Trench 5

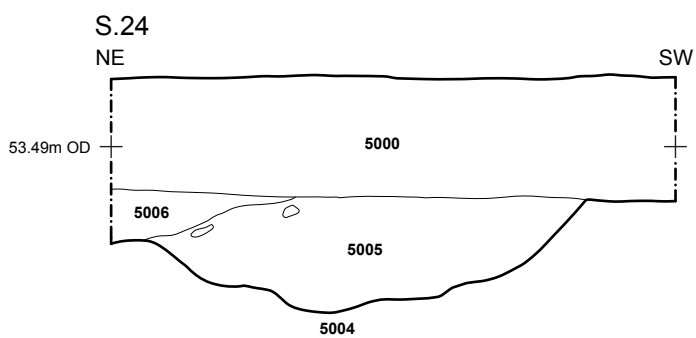
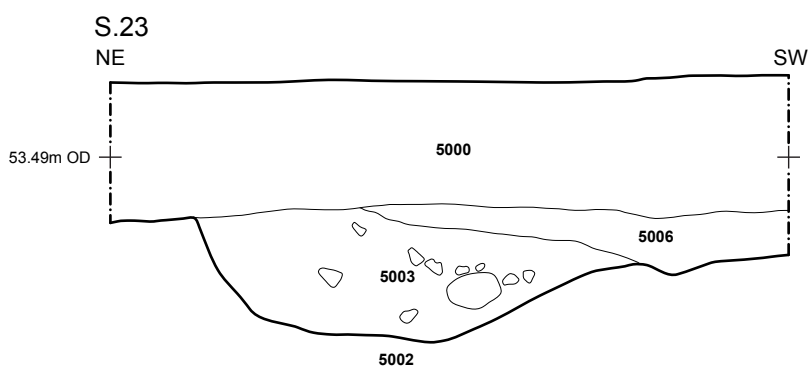
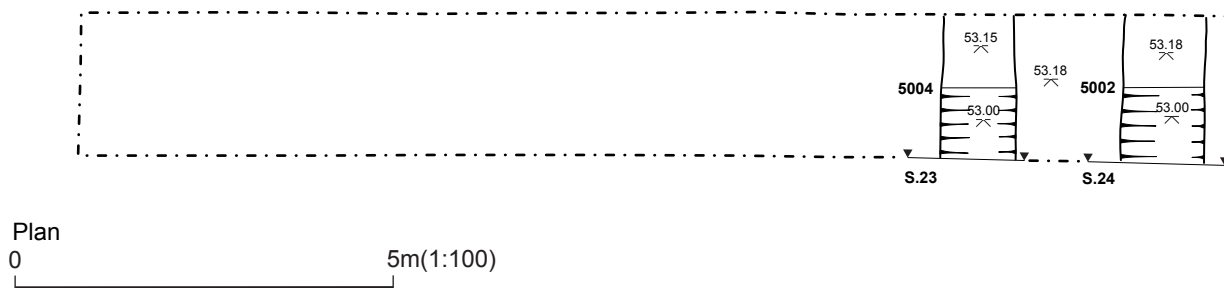


Fig. 3. Trench 5, plan and sections

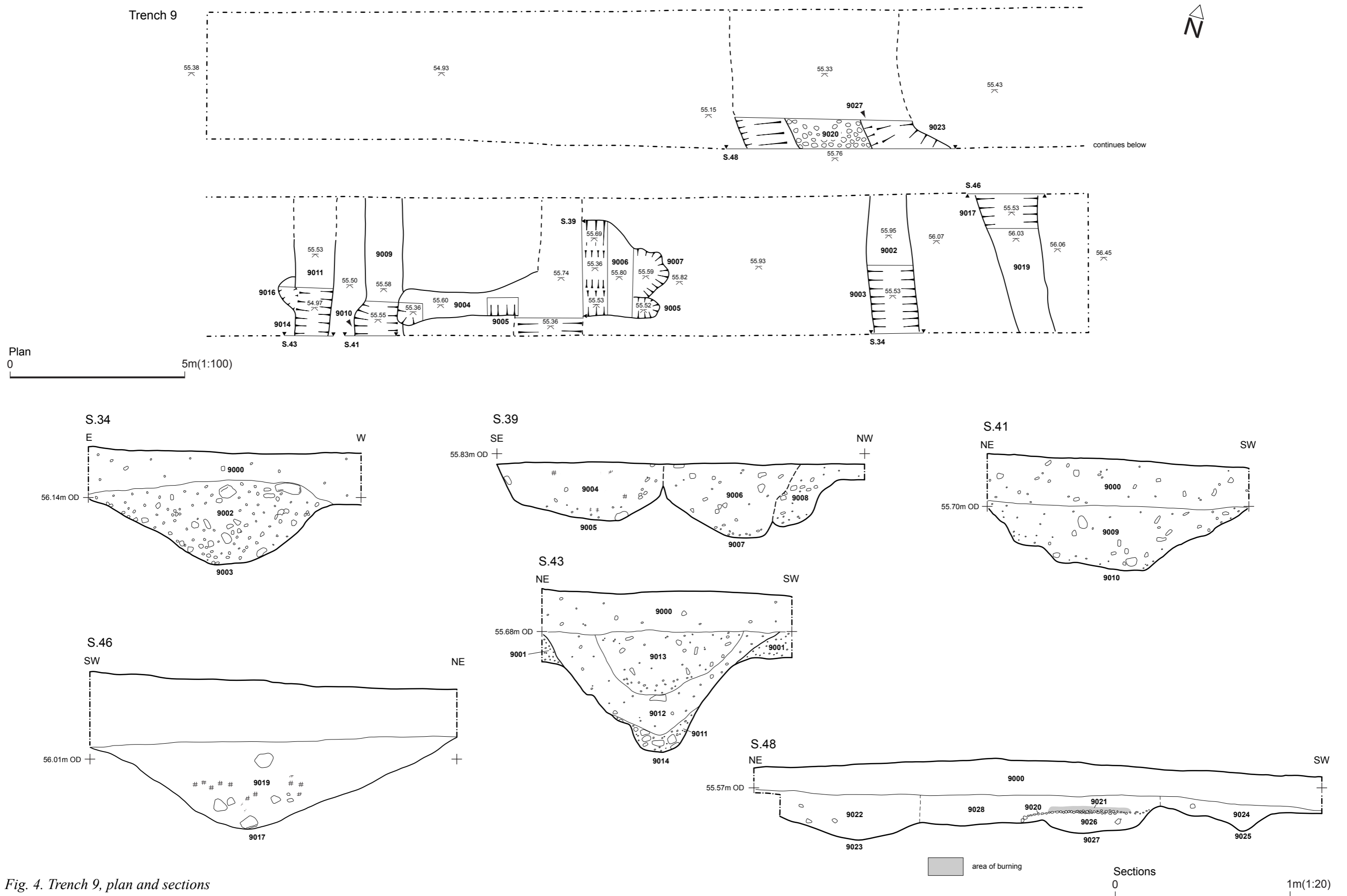


Fig. 4. Trench 9, plan and sections

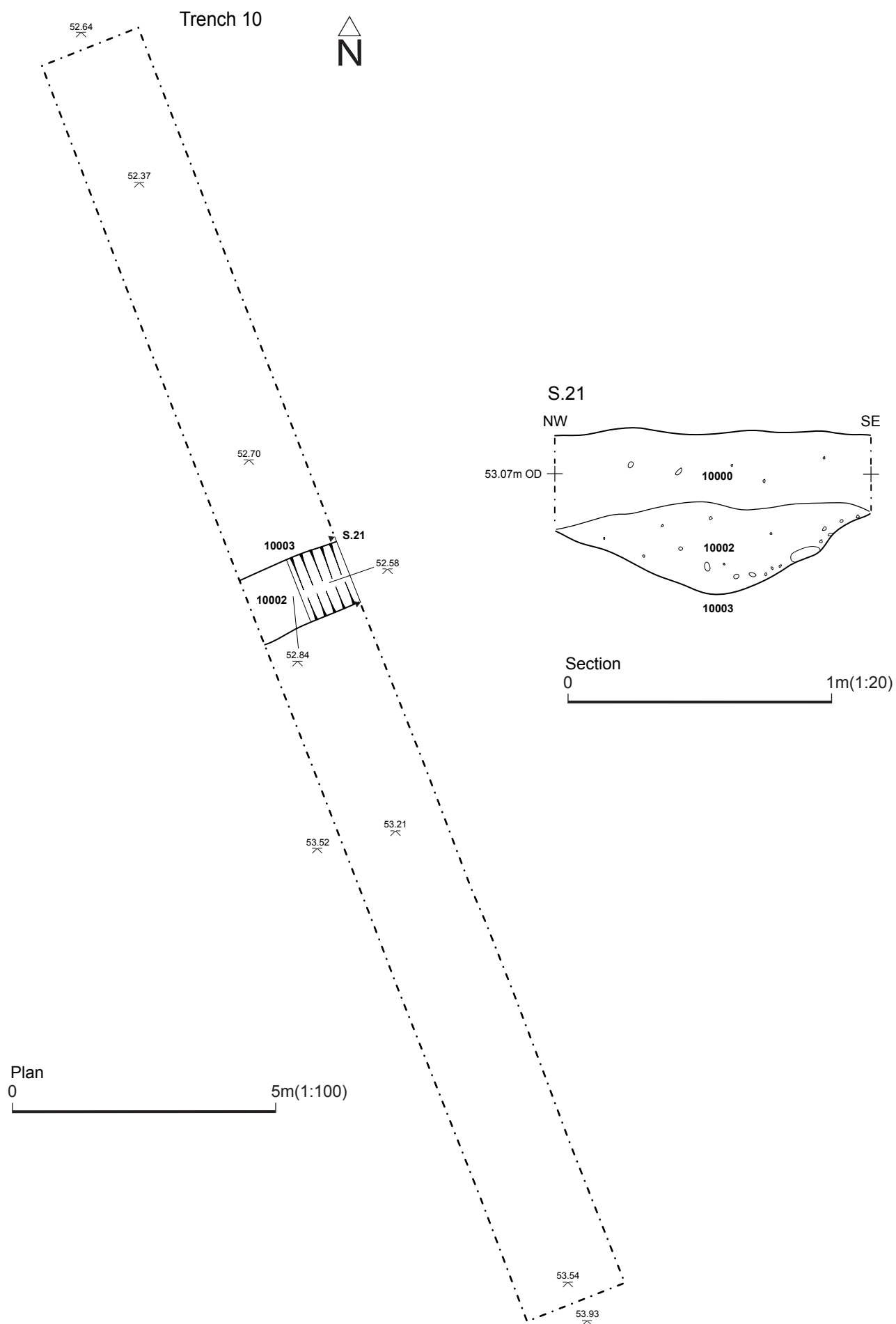


Fig. 5. Trench 10, plan and section

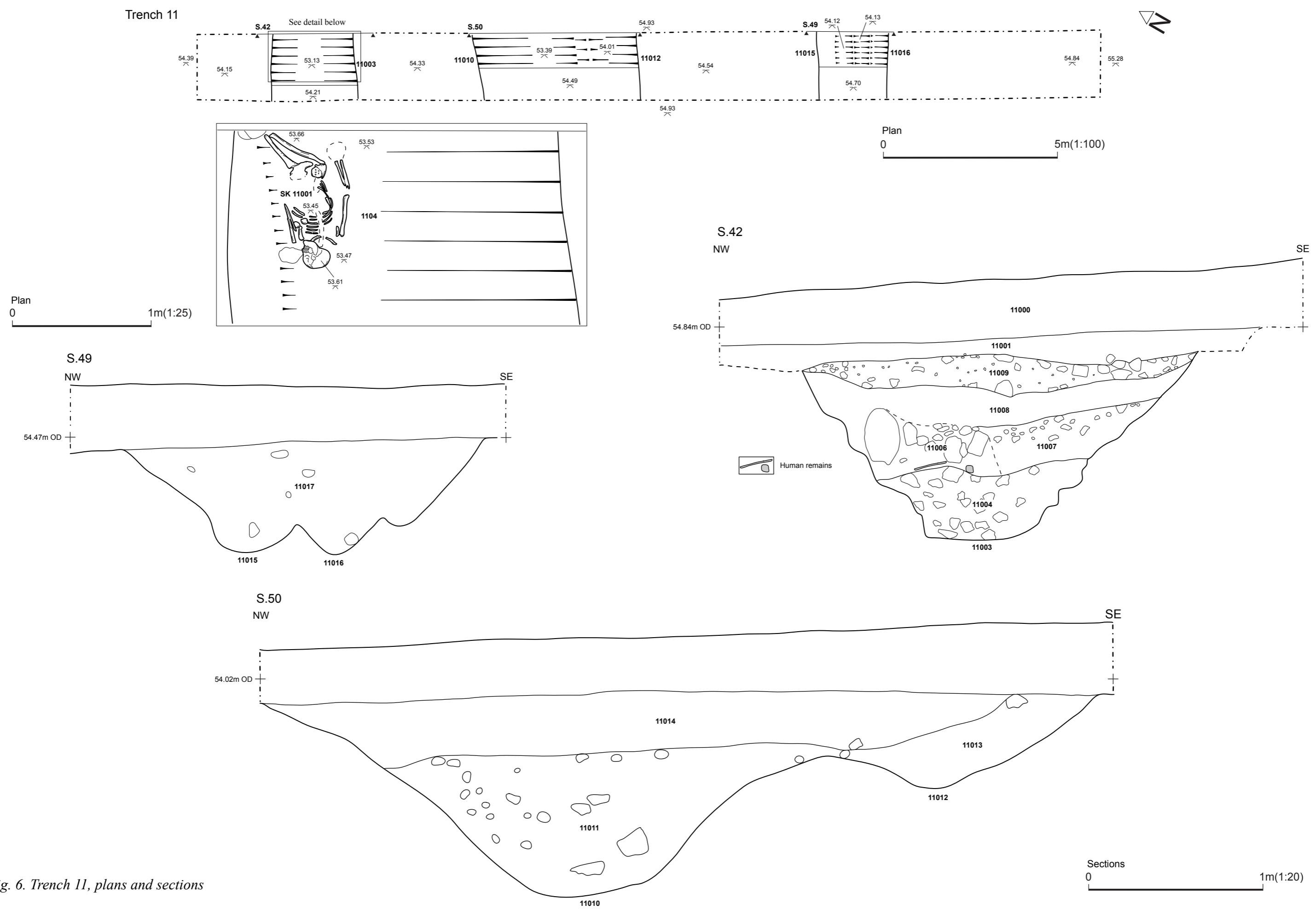
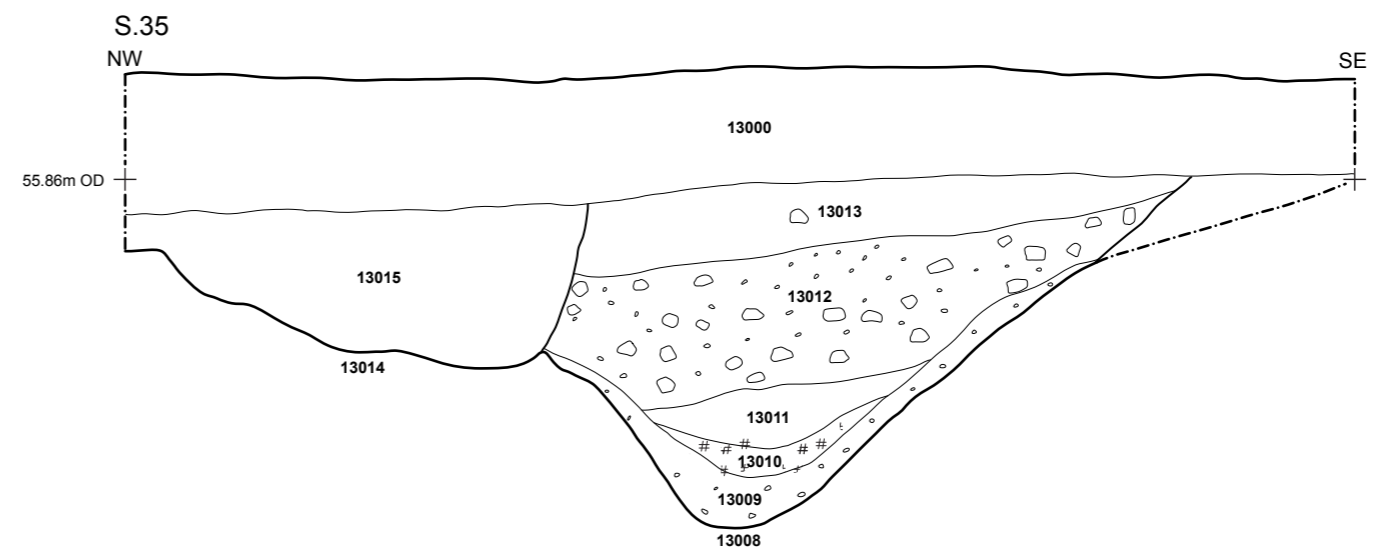
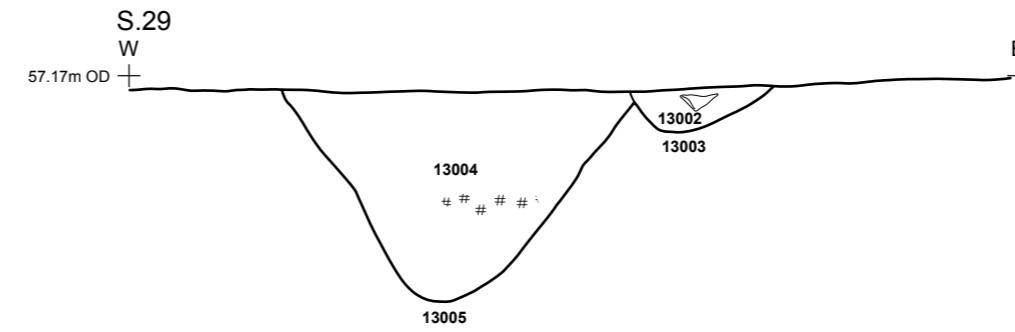
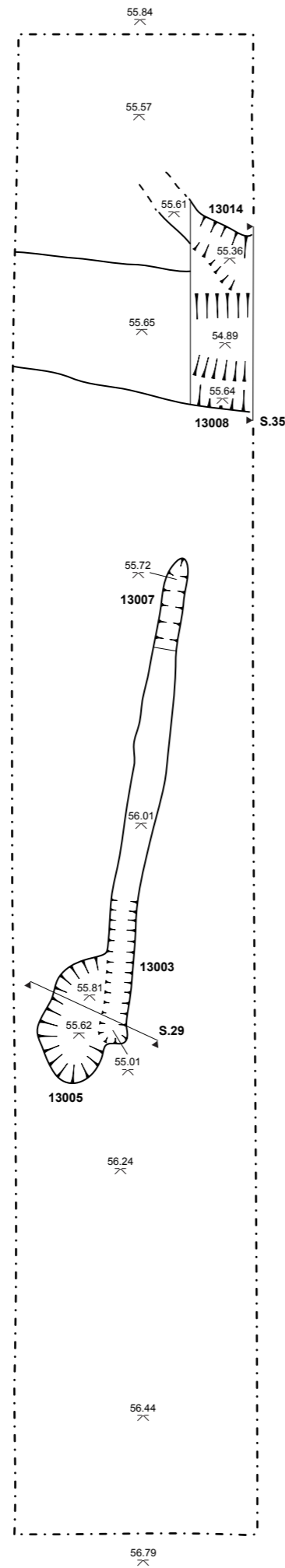


Fig. 6. Trench 11, plans and sections

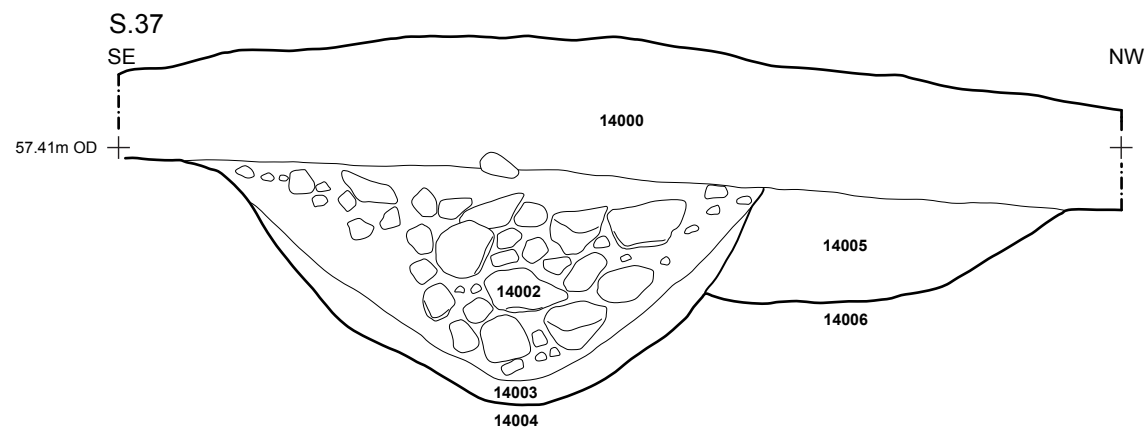
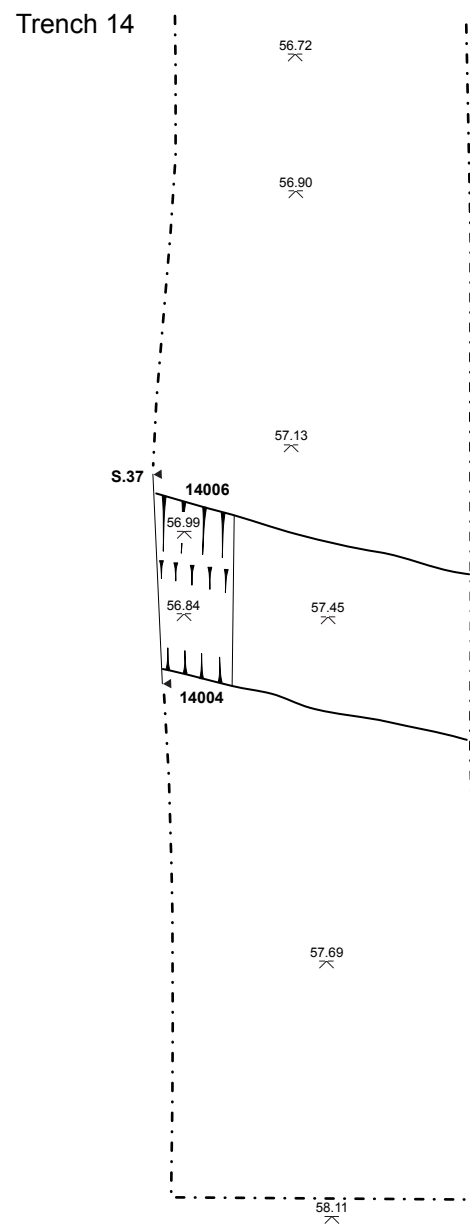
Trench 13



Sections
0 1m(1:20)

Plan
0 5m(1:100)

Fig. 7. Trench 13, plan and sections

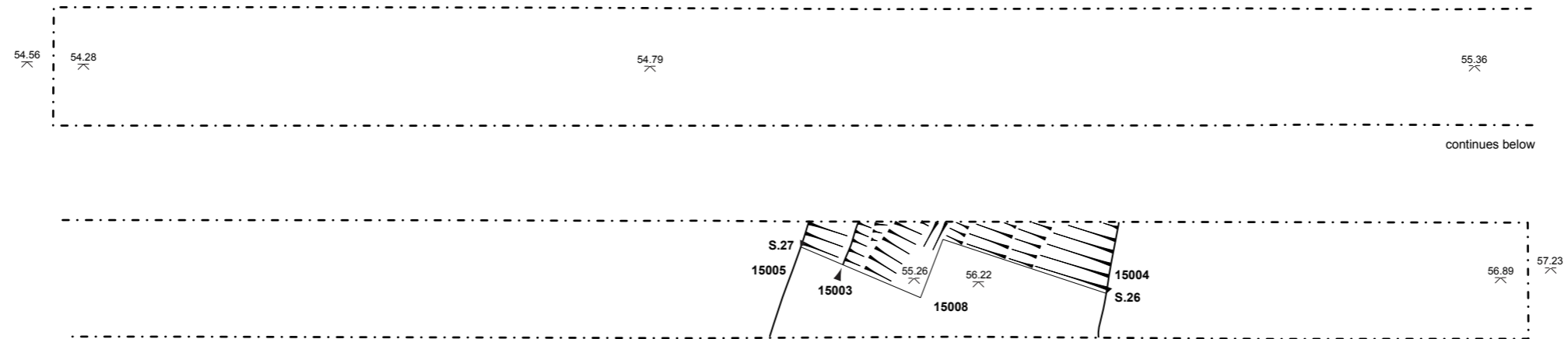


Section
0 1m(1:20)

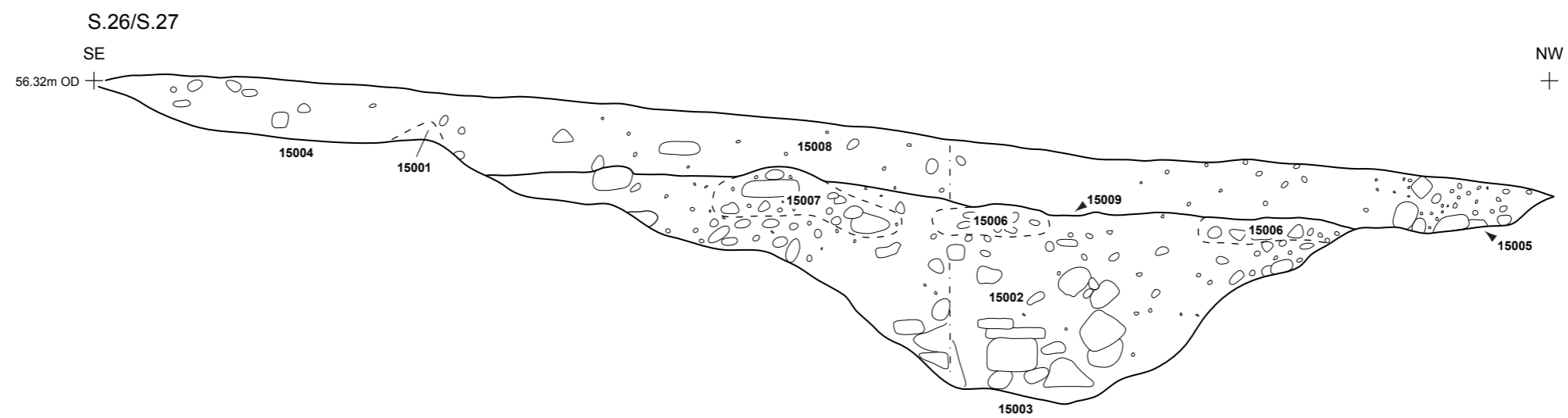
Plan
0 5m(1:100)

Fig. 8. Trench 14, plan and section

Trench 15

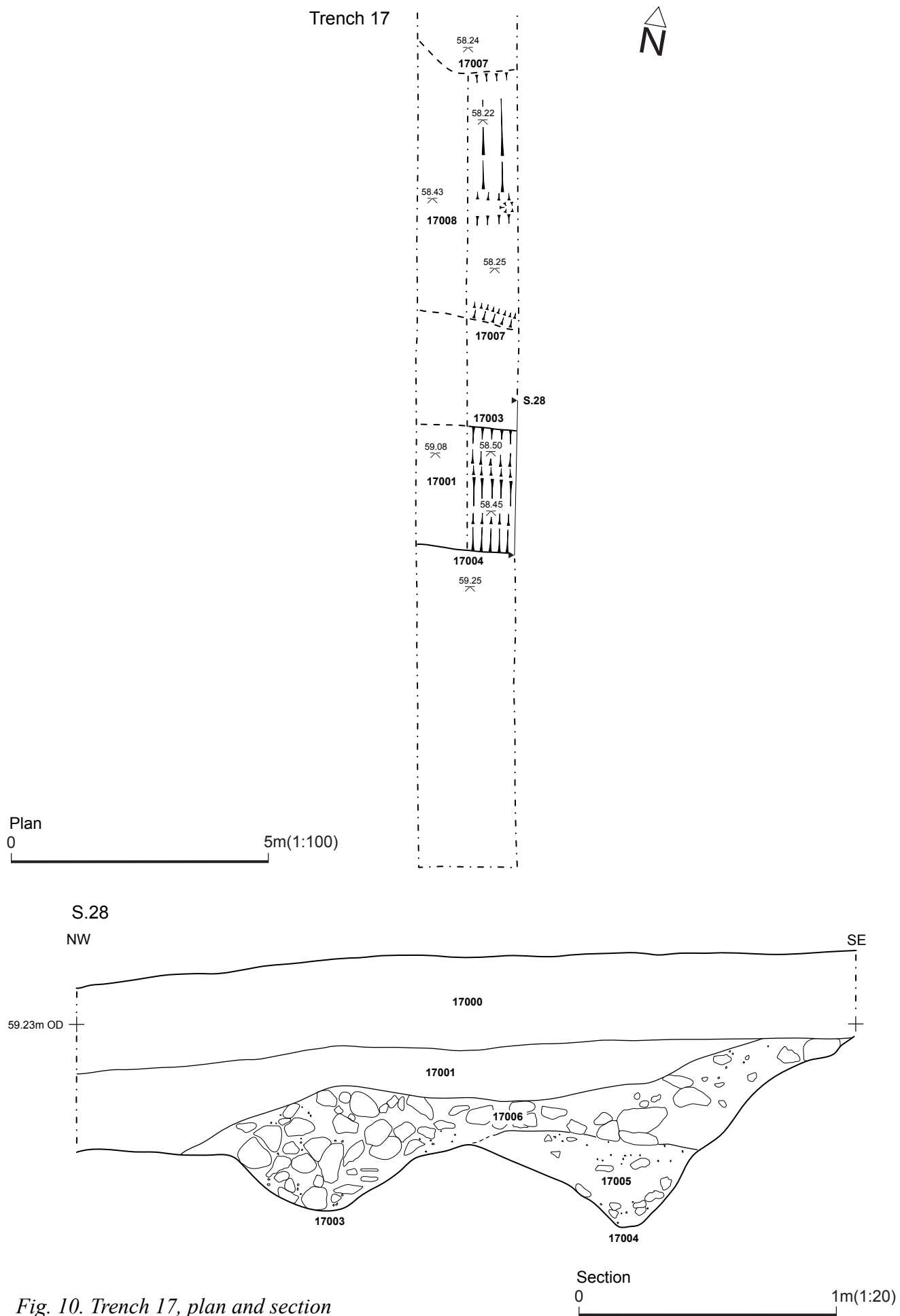


Plan
0 5m(1:100)



Section
0 1m(1:20)

Fig. 9. Trench 15, plan and section





Trench 18

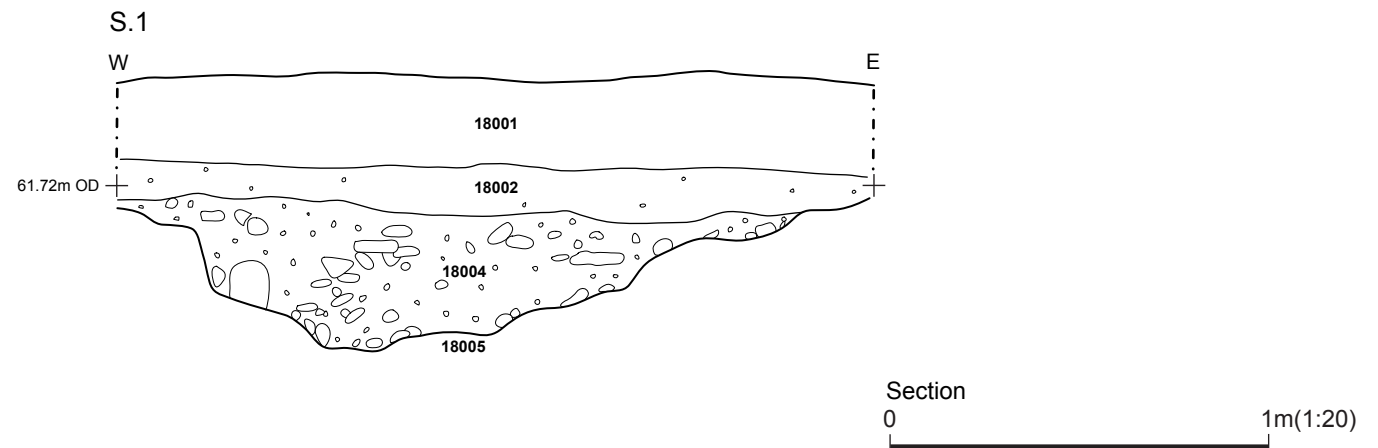
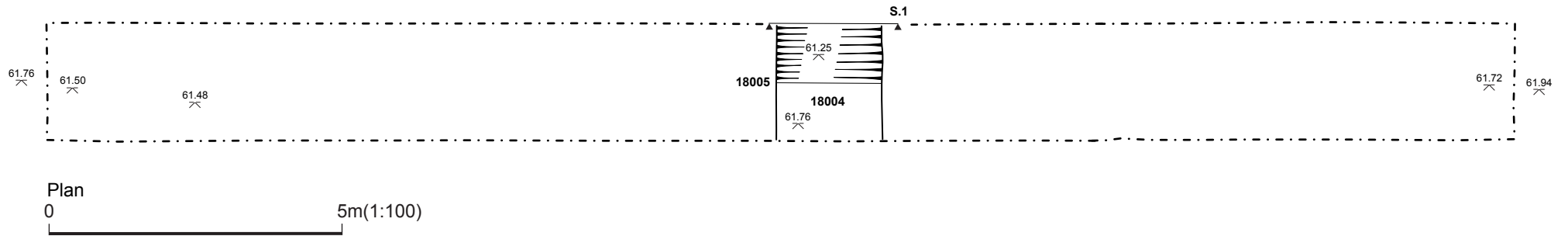


Fig. 11. Trench 18, plan and section



Trench 19

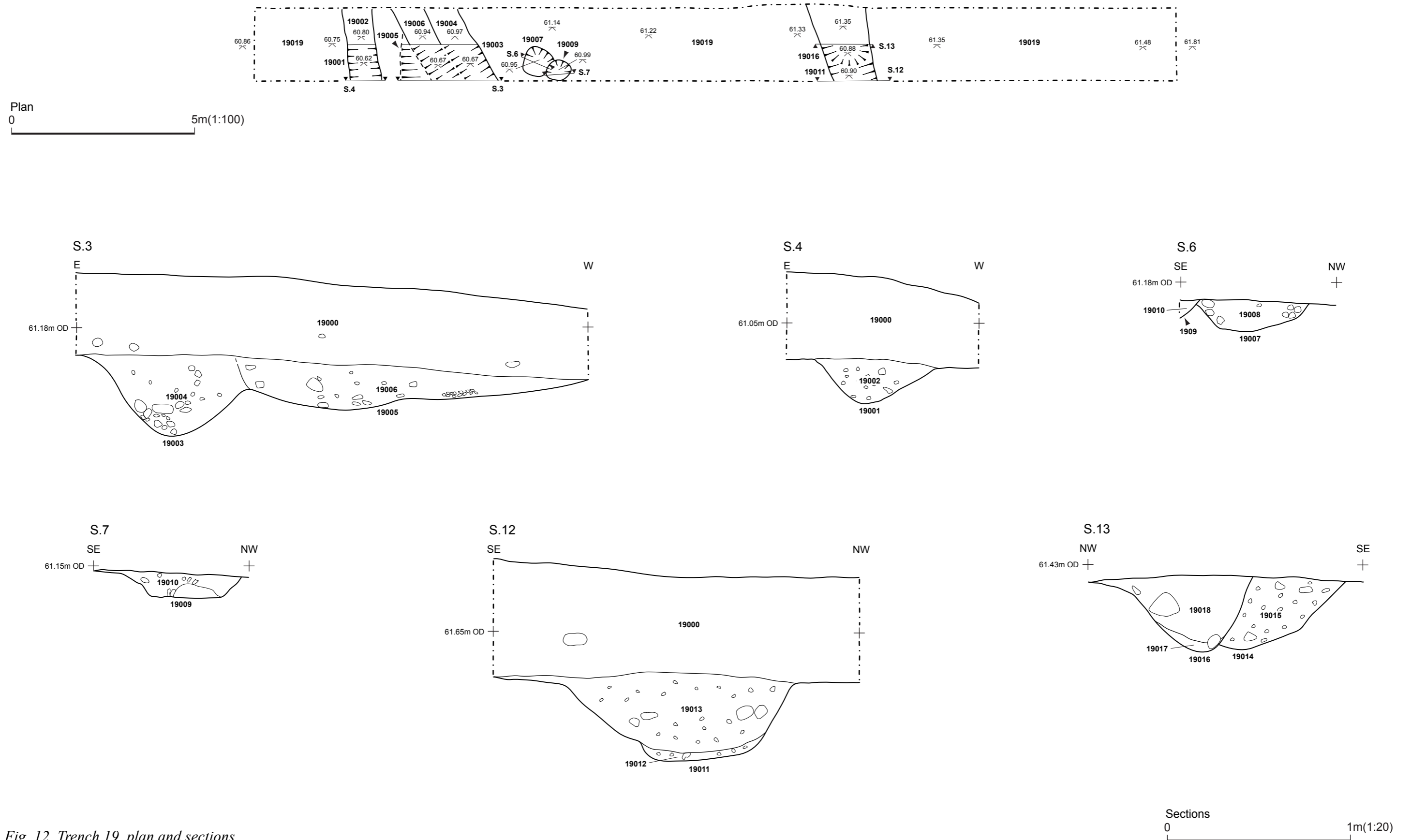


Fig. 12. Trench 19, plan and sections

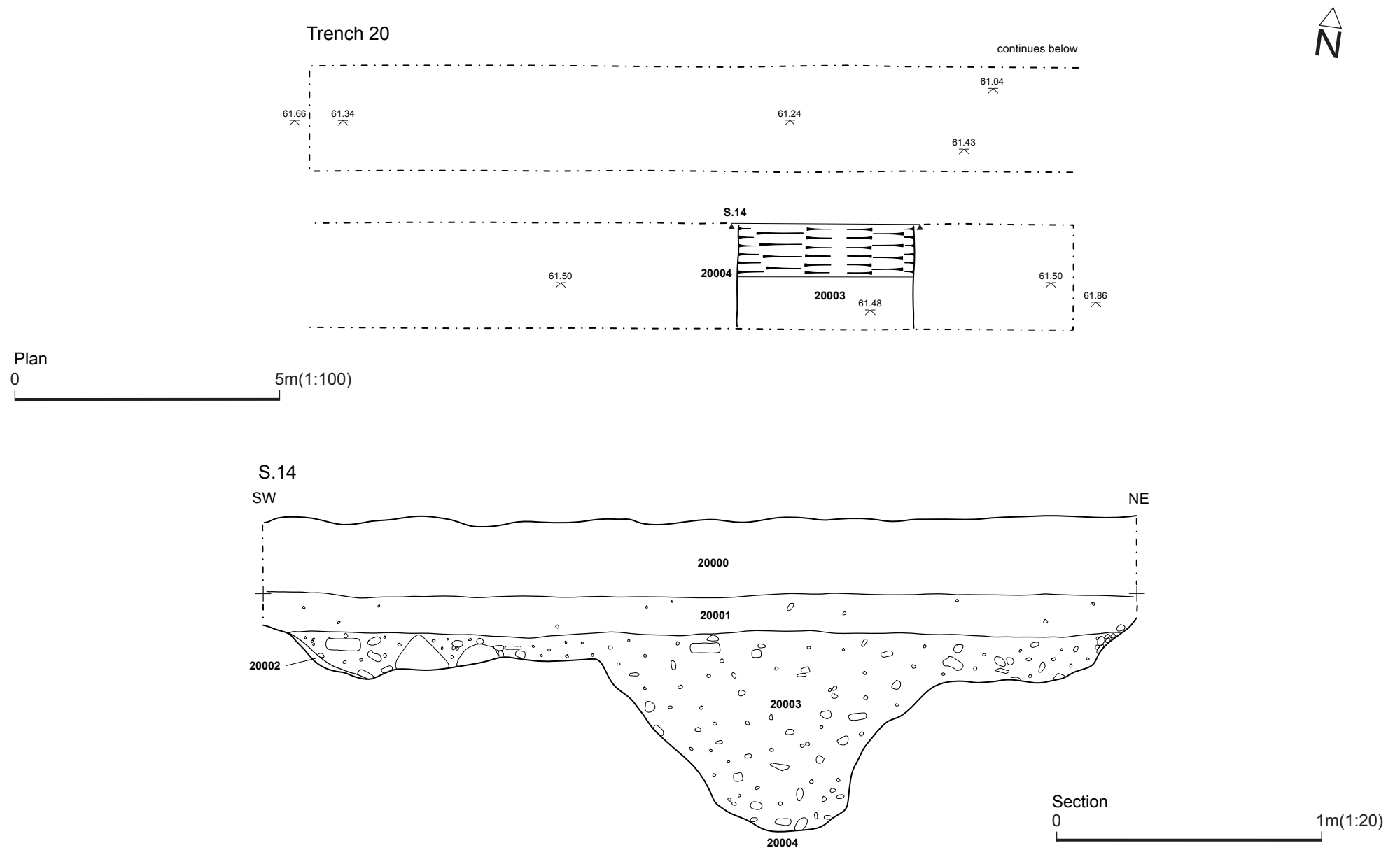


Fig. 13. Trench 20, plan and section



Plate 1. Trench 11, showing Ditch 11003, looking north-east



Plate 2. Trench 11, showing Skeleton 11001 within Ditch 11003



Plate 3. Trench 11, showing Ditches 11010 and 11012, looking east



Plate 4. Trench 11, showing Ditches 11015 and 11016, looking east



Plate 5. Trench 13, showing Ditches 13005 and 13003, looking north



Plate 6. Trench 14, showing Ditches 14004 and 14006, looking west



Plate 7. Trench 17, showing Ditches 17003 and 17004, looking east



Plate 8. Quernstone recovered from context 13002, SF. 1



Plate 9. Stone object, possible trough recovered from context 14002, SF. 3

Appendix 1: Inventory of primary archive

Phase	File/Box No	Description	Quantity
Evaluation	File no.1	Daily site recording forms	19
		Trench record sheets	21
		Context register sheets	13
		Drawing sheet register forms	1
		Drawing register sheets	3
		Skeleton register sheets	1
		Skeleton record sheets	2
		Levels sheets	13
		Sample register sheets	1
		Finds register sheets	13
		Photo register sheets	12
		Colour negative films (8776, 8778, 8779, 8782)	4
		B&W negative films (8775, 8777, 8779, 8781)	4
		Digital photographs CD	1
	File no. 2	Context sheets (nos. 1000-20004)	148
	File no. 3	A3 permatrace sheets – sections and plans	

Appendix 2: Concordance of contexts yielding artefacts or environmental remains

Context	Trench	Description	Artefacts and environmental samples ¹
1000	1	Topsoil	
1001	1	Natural	
2000	2	Topsoil	
2001	2	Natural	
3000	3	Topsoil	
3001	3	Natural	
4000	4	Topsoil	
4001	4	Natural	
5000	5	Topsoil	
5001	5	Natural	
5002	5	Cut of gully	
5003	5	Fill of cut 5002	Pottery (23)
5004	5	Cut of gully	
5005	5	Fill of cut 5004	
5006	5	Subsoil	
6000	6	Topsoil	
6001	6	Natural	
7000	7	Topsoil	
7001	7	Natural	
8000	8	Topsoil	
8001	8	Natural	
9000	9	Topsoil	
9001	9	Natural	
9002	9	Fill of cut 9003	Pottery (6); GBA 19
9003	9	Cut of ditch	
9004	9	Fill of cut 9005	Pottery (RB1, Prehistoric 1); animal bone (54)
9005	9	Cut of ditch	
9006	9	Fill of cut 9007	Prehistoric Pottery (1); animal bone (3)
9007	9	Cut of hollow	
9008	9	Natural deposit	
9009	9	Fill of cut 9010	GBA 25
9010	9	Cut of ditch	
9011	9	Primary fill of cut 9014	
9012	9	Secondary fill of cut 9014	Prehistoric Pottery (1); GBA 27
9013	9	Tertiary fill of cut 9014	
9014	9	Cut of ditch	
9015	9	Fill of pit 9016	GBA 28
9016	9	Cut of pit	
9017	9	Cut of ditch	
9018	9	Natural	
9019	9	Fill of cut 9017	
9020	9	Cobbled surface within hollow 9027	
9021	9	Burnt layer within hollow 9027	Fe object - SF.4 (1)

Context	Trench	Description	Artefacts and environmental samples¹
9022	9	Fill of cut 9023	
9023	9	Cut of ditch	
9024	9	Fill of cut 9025	
9025	9	Cut of ditch	
9026	9	Primary fill of cut 9027	
9027	9	Cut of hollow	
9028	9	Upper fill of cut 9027	
10000	10	Topsoil	
10001	10	Natural	
10002	10	Fill of cut 10003	GBA 10
10003	10	Cut of ditch	
11000	11	Topsoil	
11001	11	Subsoil	
11002	11	Natural	
11003	11	Cut of ditch	
11004	11	Primary fill of ditch 11003	GBA 23
11005	11	VOID	
11006	11	Backfill over skeleton 11001, secondary fill of ditch 11003	Sk 11001; GBA 22; sample 24 (right hand of Sk11001); sample 26 (feet of Sk11001)
11007	11	Tertiary fill of ditch 11003	Pottery (2); Animal bone (1)
11008	11	Quaternary fill of ditch 11003	
11009	11	Upper fill of ditch 11003	
11010	11	Cut of ditch	
11011	11	Primary fill of cut 11010	
11012	11	Cut of ditch	
11013	11	Primary fill of cut 11012	
11014	11	Upper fill of cuts 11010/ 11012	Pottery (2)
11015	11	Cut of ditch	
11016	11	Cut of ditch	
11017	11	Fill of ditches 11015/ 11016	
12000	12	Topsoil	
12001	12	Natural	
13000	13	Topsoil	
13001	13	Natural	
13002	13	Fill of cut 13003	Pottery (3); Quernstone - SF 1 (1); GBA 15
13003	13	Cut of gully, same as 13007	
13004	13	Fill of cut 13003	GBA 16
13005	13	Cut of pit	
13006	13	Fill of cut 13007	
13007	13	Cut of gully, same as 13003	
13008	13	Cut of ditch	
13009	13	Primary fill of cut 13008	GBA 20
13010	13	Secondary fill of cut 13008	
13011	13	Tertiary fill of cut 13008	
13012	13	Quaternary fill of cut 13008	
13013	13	Upper fill of 13008	

Context	Trench	Description	Artefacts and environmental samples¹
13014	13	Cut of gully	
13015	13	Fill of cut 13014	
14000	14	Topsoil	
14001	14	Natural	
14002	14	Secondary fill of cut 14004	Pottery (20); animal bone (15); CBM (15); Worked stone? - SF 3 (1); glass - SF. 5 (3); GBA 21
14003	14	Primary fill of cut 14004	
14004	14	Cut of ditch	
14005	14	Fill of cut 14006	
14006	14	Cut of gully	
15000	15	Topsoil	
15001	15	Natural	
15002	15	Primary fill of cut 15003	Animal bone (1); Cu object - SF 2 (1); GBA 13
15003	15	Cut of ditch	
15004	15	Erosion interface, rut	
15005	15	Erosion interface, rut	
15006	15	Cobbled surface over 15009	
15007	15	Same as 15006	
15008	15	Layer over 15004, 15005, 15006, 15009	Burnt wood (1); GBA 14
15009	15	Erosion interface, hollow way	
16000	16	Topsoil	
16001	16	Subsoil	
16002	16	Natural	
17000	17	Topsoil	
17001	17	Subsoil	
17002	17	Natural	
17003	17	Cut of ditch	
17004	17	Cut of ditch	
17005	17	Primary fill of cut 17004	Pottery (2); GBA 17
17006	17	Primary fill of cut 17003	Animal bone (1)
17007	17	Cut of hollow	
17008	17	Fill of cut 17007	GBA 18
18000	18	UNUSED	
18001	18	Topsoil	
18002	18	Subsoil	
18003	18	Natural	
18004	18	Fill of cut 18005	Animal bone (26); worked flint (1); charcoal (2); GBA 01
18005	18	Cut of ditch	
19000	19	Topsoil	
19001	19	Cut of gully	
19002	19	Fill of gully 19001	
19003	19	Cut of ditch	
19004	19	Fill of cut 19003	Prehistoric Pottery (1)

Context	Trench	Description	Artefacts and environmental samples¹
19005	19	Cut of ditch	
19006	19	Fill of cut 19005	Flint (1); GBA 6
19007	19	Cut of pit	
19008	19	Fill of cut 19007	GBA 2
19009	19	Cut of pit	
19010	19	Fill of cut 19009	Animal bone (177); GBA 3
19011	19	Cut of ditch	
19012	19	Primary fill of cut 19011	Animal bone (8); GBA 7
19013	19	Secondary fill of cut 19011	Pottery (1)
19014	19	Cut of gully	
19015	19	Fill of cut 19014	
19016	19	Cut of ditch	
19017	19	Primary fill of cut 19016	Animal bone (1)
19018	19	Secondary fill of cut 19016	GBA 8
19019	19	Natural	
20000	20	Topsoil	
20001	20	Subsoil	
20002	20	Natural	
20003	20	Fill of cut 20004	Animal bone (7); GBA 9
20004	20	Cut of ditch	
unstratified	-		Worked flint (1)

Appendix 3: Written scheme of investigation for a programme of trial trenching

Jackdaw Crag Quarry Extension North Yorkshire

Written Scheme of Investigation for a Programme of Trial Trenching

1. Introduction

- 1.1 A programme of archaeological evaluation via trial trenching is proposed that will inform the Environmental Impact Assessment and allow North Yorkshire County Council to make an informed decision on any planning application submitted for the proposed southern extension to Jackdaw Crag Quarry, operated by Darrington Quarried Limited. This document is produced by Archaeological Services WYAS at the request of Richard Hunt of Turley Associates, acting on behalf of Darrington Quarried Limited.

2. Site location

- 2.1 The site lies approximately 1.5km west of the village of Stutton, to the south-west of Tadcaster, at SE 4650 4105. Topographically the eastern part of the site lies at about 60m aOD, falling to 50m aOD in the central and western areas. The geology is Lower Magnesian Limestone, overlain by glacial sand and gravel drift (British Geological Survey 1974). The soils are of the Aberford Association, being shallow, brashy and well drained calcareous fine loams (Soil Survey of England and Wales 1980).

3. Archaeological Background

- 3.1 A Desk-based Assessment revealed that although there was no known archaeology within the proposed extension area, or its immediate vicinity, the wider landscape contained extensive areas of cropmarks, typical of Late Iron Age and Romano-British settlement (Grassam 2009). A subsequent geophysical survey of almost the whole site confirmed the existence of a number of several former enclosures and field boundaries and a double ditched trackway (Webb and Wilkins 2009).

4. Evaluation Methodology

Aims

- 4.1 The aim of the proposed trial trenching stage of the evaluation is to provide detailed information on the form, character and date of the known geophysical anomalies, as well for any additional archaeological features that remained invisible to geophysical detection.

Scope of Work

- 4.2 It is proposed that 20 trenches of varying dimensions will be excavated (see accompanying figure). This represents a 2.3% sample (1400m²) of the proposed extension area. Trenches are to be targeted on known geophysical anomalies that have been interpreted as being potentially archaeological, as well as apparently blank areas and areas rendered sterile to geophysical survey by the presence of an east-west gas pipe, though avoiding the line of the actual pipe with an appropriate stand-off. A more detailed rationale for each trench is tabulated below.

<i>Trench No</i>	<i>Dims (m)</i>	<i>Purpose</i>
1	25 x 2	To investigate a possible linear feature
2	25 x 2	To investigate an apparently blank area of the site
3	25 x 2	To investigate an apparently blank area of the site and the westward continuation the ditches to the east
4	50 x 2	To investigate two possible linear features
5	25 x 2	To investigate two potential linear features
6	25 x 2	To investigate an apparently blank area of the site rendered blind to geophysical survey due to the effects of the pipe trench
7	10 x 5	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
8	10 x 5	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
9	50 x 4	To investigate a series of enclosure ditches and possible structures
10	25 x 2	To investigate a possible linear feature and an apparently blank area of the site
11	25 x 2	To investigate three linear ditches seemingly forming a succession of boundaries or trackways

12	10 x 5	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
13	25 x 4	To investigate the an enclosure ditch and its interior, with respect to distinct geophysical anomalies
14	25 x 4	To investigate the possibility of settlement activity to the south of the Trench 13 enclosure, the apparent curtailment of the southern enclosure ditch and the field boundary to the south
15	50 x 2	To investigate a possible enclosure and the continuity of the three linear ditches investigated by Trench 11
16	10 x 5	To investigate an apparently blank area of the site with a view to identifying elements of unenclosed settlement
17	50 x 2	To investigate an apparently blank area of the site and an extensive area of magnetic disturbance
18	25 x 2	To investigate a potential boundary ditch and enclosure
19	25 x 2	To investigate an apparently blank area of the site rendered blind to geophysical survey due to the effects of the pipe trench
20	25 x 2	To investigate a potential boundary ditch and enclosure
Total	1400m ²	

Methodology

- 4.3 All work will be carried out in accordance with the appropriate IfA Standard. Trench positions will be set out using a Trimble 5600 total station theodolite. The site grid will be tied into permanent landscape features and superimposed onto digital data supplied by the client. Survey stations and semi-permanent marker pegs will be left on site, so that the grid can be accurately re-located by a third party.
- 4.4 The controlled stripping of plough soil to the archaeologically required level shall be carried out using a 360° tracked excavator equipped with a toothless ditching bucket

under archaeological supervision. Stripping will take place in level spits to the top of the first archaeological horizon or undisturbed natural. The resulting surface will be inspected for archaeological remains. Where archaeological remains require clarification, the relevant area will be cleaned by hand. Under no circumstances will the machine be used to cut arbitrary trenches down to natural deposits, nor shall plant run upon the stripped area unless it is agreed with the supervising archaeologist.

- 4.5 Archaeological features will be planned and then manually excavated in an controlled and stratigraphic manner in order to meet the aims and objectives outlined above. The features will be investigated employing the following sampling strategies:
- Linear features: sufficient excavation will be carried out to investigate the depth, profile and fills of a ditch or gully and to recover dating and environmental evidence from its fills. Normally this will involve a minimum of 10% sample dispersed along the length of the feature (each sample section to be not less than 1m), or a minimum of a 1m sample section if the feature is less than 10m long or if only a small part of it is exposed. With respect to trial trenches, one 1m section will be located and recorded adjacent to the trench edge. Feature intersections will always be excavated in such a way to determine a stratigraphic relationship.
 - Discrete features: pits, post-holes and other discrete features will normally be half-sectioned to determine and record their form with a minimum sample of 50% of discrete features in each area. The complete excavation of such features may be appropriate, but only following consultation with the North Yorkshire County Council Historic Environment Team.
- 4.6 A full written, drawn and photographic record of all material revealed during the course of the work shall be made. The excavation limits will be surveyed using electronic survey equipment with larger scale hand drawn plans of features at 1:20 or 1:50, as appropriate. Sections of linear and discrete features will be drawn at 1:10. All sections, plans and elevations will include spot-heights related to Ordnance Datum in metres as correct to two decimal places and survey. Tie-in information will be undertaken during the course of the evaluation and will be fixed in relation to nearby permanent structures and roads and to the National Grid.
- 4.7 All artefacts recovered will be retained and removed from the site for assessment and analysis, and where it is appropriate finds shall be recorded three dimensionally. Non-modern artefacts will be collected from the excavated topsoil and subsoil. Finds material will be stored in controlled environments, where appropriate. All artefacts recovered will be retained, cleaned, labelled and stored as detailed in the guidelines laid out in the IfA Guidelines for Finds Work. Any conservation work will be undertaken by approved conservators working to UKIC guidelines.
- 4.8 All excavated archaeological contexts shall be recorded by detailed written records giving details of location, composition, shape, dimensions, relationships, finds, samples, and cross-references to other elements of the record and other relevant contexts, in accordance with best practice and in accordance with methods

previously approved by the North Yorkshire County Council Historic Environment Team. All contexts, and any small finds and samples from them will be given unique numbers. Bulk finds will be collected by context. Colour digital and monochrome negative photographs at a minimum format of 35mm will be taken.

- 4.9 A soil-sampling programme shall be undertaken during the course of the investigation for the identification and recovery of carbonised and waterlogged remains, vertebrate remains, molluscs and small artefactual material. English Heritage's Regional Science Advisor, environmental and soil specialists will be consulted during the course of the excavation with regard to the implementation of this sampling programme. Provision should be made for the removal of soil samples of a minimum 30 litres from deposits with clear potential, and larger samples (40 – 60 litres) from any rich carbonised deposits. Samples may also be taken from seemingly sterile deposits. Particular attention will be paid to the sampling of the primary fills from ditches and pits any surviving buried soils beneath banks or other positive features. Environmental material removed from site will be stored in appropriate controlled environments. The collection and processing of environmental samples will be undertaken in accordance with guidelines set out in the Association for Environmental Archaeology's (1995) Working Paper No. 2, *Environmental Archaeology and Archaeological Evaluations - Recommendations concerning the environmental archaeology component of archaeological evaluations in England* and English Heritage's (2002) guidelines *Environmental Archaeology. A guide to the theory and practice of methods, from sampling and recovery to post-excavation*. In addition, the processing of environmental samples will only take place within facilities approved for such purposes by English Heritage's Regional Science Advisor.
- 4.10 In the event of human remains being discovered they will be left *in situ* and covered and protected in the first instance. The removal of human remains will only take place in compliance with the Burial Act 1857 and with an exhumation licence obtained from the Ministry of Justice (MoJ) prior to the removal of the remains. Provision will be made for the specialist reporting of the remains by a recognised osteoarchaeologist.
- 4.11 Provision will be made for the recovery of samples suitable for scientific dating (e.g. radiocarbon/AMS dating, archaeomagnetic and dendrochronological dating).
- 4.12 All finds of gold and silver and associated objects shall be reported to HM Coroner according to the procedures relating to the Treasure Act 1997, after discussion with the North Yorkshire County Council Historic Environment Team.

5. Analysis and Reporting

- 5.1 The site archive will contain all the data collected during the excavation, including records, finds and environmental samples. It will be quantified, ordered, indexed and internally consistent. Adequate resources will be provided during fieldwork to ensure that all records are checked and internally consistent. Archive consolidation will be undertaken immediately following the conclusion of fieldwork:

- the site record will be checked, cross-referenced and indexed as necessary;
 - all retained finds will be cleaned, conserved, marked and packaged in accordance with the requirements of the recipient museum;
 - all retained finds will be assessed and recorded using pro forma recording sheets, by suitably qualified and experienced staff. Initial artefact dating will be integrated within the site matrix;
 - all retained environmental samples will be processed by suitably experienced and qualified staff and recorded using pro forma recording sheets.
- 5.2 The archive will be assembled in accordance with the specification set out in English Heritage's (1991) *Management of Archaeological Projects; Appendix 3*. In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain:
- site matrices where appropriate;
 - a summary report synthesising the context record;
 - a summary of the artefact record;
 - a summary of the environment record.
- 5.3 The integrity of the primary field record will be preserved and security copies maintained if appropriate.
- 5.4 Provision will be made for the deposition of the archive, artefacts and environmental material, subject to the permission of the relevant landowner (and if no further archaeological work is to be initiated), in the appropriate recipient museum. The museum will be advised of the timetable for the proposed investigation prior to excavation commencing. The archive will be prepared in accordance with the guidelines published in "*Guidelines for the preparation of Excavation Archives for long-term storage*" (United Kingdom Institute for Conservation, 1990) and *Standards in the Museum care of archaeological collections* (Museums and Galleries Commission 1994). Provision will be made for the stable storage of paper records and their long-term storage.
- 5.5 Upon completion of the investigations, the artefacts, ecofacts and stratigraphic information shall be assessed as to their potential and significance for further analysis.
- 5.6 An assessment report will be prepared within an agreed timescale following the completion of on-site archaeological investigations and include the following:
- a non-technical summary of the results of the work;

- a summary of the project's background;
 - the site location;
 - an account of the method;
 - the results of the excavation, including phasing and interpretation of the site sequence and spot-dating of artefacts, if recovered;
 - an assessment of the stratigraphic and other written, drawn and photographic records;
 - a catalogue of the archaeological material recovered during the excavation
 - a summary of the contents of the project archive and its location
 - recommendations for any further work.
- 5.7 The report will be produced within an agreed timetable. It will be supported by an overall plan of the site, accurately identifying the location of the trial excavations.
- 5.8 Finally, the report will outline the archaeological significance of the deposits identified, and provide an interpretation of the results in relation to other sites in the vicinity. The final report, including all finds analysis and scientific dating results, shall be produced in accordance with English Heritage's *Management of Archaeological Projects* (English Heritage 1991).
- 5.9 Copies of the report will be supplied to Darrington Quarries Limited, Turley Associates, English Heritage and to the NYCC Historic Environment Record, who shall also receive a digital copy.
- 5.10 Upon completion of the work, the archaeological contractor will make their work accessible to the wider research community by submitting digital data and copies of reports online to OASIS (<http://ads.ahds.ac.uk/project/oasis/>).
- 5.11 It is possible that the excavation findings will warrant wider publication. This shall be effected either through a local journal or regional newsletter, such as the *Yorkshire Archaeological Journal* or *CBA Forum*, as appropriate.

6 Copyright, Confidentiality and Publicity

- 6.1 Copyright in the documentation prepared by the archaeological contractor and specialist sub-contractors should be the subject of additional licences in favour of the repository accepting the archive and North Yorkshire County Council to use such documentation for their statutory educational and museum service functions, and to provide copies to third parties as an incidental to such functions.

- 6.2 Under the Environmental Information Regulations 2005 (EIR), information submitted to the HER becomes publicly accessible, except where disclosure might lead to environmental damage, and reports cannot be embargoed as 'confidential' or 'commercially sensitive'.
- 6.3 Requests for sensitive information are subject to a public interest test, and if this is met, then the information has to be disclosed. The archaeological contractor should inform the client of EIR requirements, and ensure that any information disclosure issues are resolved before completion of the work. Intellectual property rights are not affected by the EIR.
- 6.4 Unless the Client commissioning the project wishes to state otherwise, the copyright of any written, graphic or photographic record and reports will rest with the originating body (Archaeological Services WYAS).

7 Health and Safety

- 7.1 Archaeological Services WYAS has its own Health and Safety policy which has been compiled using national guidelines such as FAME. The guidelines conform to all relevant Health and Safety legislation.
- 7.2 In addition each project undergoes a 'Risk Assessment' which sets project specific Health and Safety requirements to which all members of staff are made aware of prior to on-site work commencing. Necessary Health and safety precautions will take priority over archaeological matters.

8 Insurance

- 8.1 Archaeological Services WYAS is covered by the insurance and indemnities of the City of Wakefield Metropolitan District Council. Insurance has been effected with: Zurich Municipal Insurance, Park House, 57–59 Well Street, Bradford, BD1 5SN (policy number RMP 03GO39–0143). Any further enquiries should be directed to: The Chief Financial Officer, Insurance Section, Wakefield MDC, PO Box 55, Newton Bar, Wakefield WF1 2TT.

9 Monitoring

- 9.1 Access to the site should be arranged through the commissioning body.
- 9.2 It is the archaeological contractor's responsibility to ensure that Health and Safety requirements are fulfilled.
- 9.3 The project will be monitored by North Yorkshire County Council's Historic Environment Team, to whom written documentation should be sent before the start of the work confirming:
- the date of commencement,

- the names of all finds and archaeological science specialists likely to be used in the evaluation, and
- notification to the proposed archive repository of the nature of the works and opportunity to monitor the works.

9.4 Where appropriate, the advice of the Regional Advisor for Archaeological Science (Yorkshire and the Humber Region) at English Heritage will be called upon.

9.5 It is the responsibility of the archaeological contractor to ensure that any significant results are brought to the attention of the Historic Environment Team and the commissioning body as soon as is practically possible.

10 Resources and Programming

10.1 Project personnel :

Project Management:	Ian Roberts BSc (Hons) FSA MifA
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Project Supervisor:	TBA
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10.2 Post-excavation specialists :

Prehistoric pottery specialists:	Dr Chris Cumberpatch
Roman pottery specialist:	Dr Ruth Leary
Medieval pottery specialist:	Dr Chris Cumberpatch
Flint specialist:	Dr Ian P Brooks
Environmental specialist:	Dr Jane Richardson
Faunal analyst:	Dr Jane Richardson
Human bone specialist:	Malin Holst MA
Metalwork specialist:	Dr Hilary Cool
Artefact conservationist:	Karen Barker

10.3 The list of Archaeological Services WYAS project personnel may be subject to change.

References

Grassam, A., 2009, Jackdaw Crag Quarry, North Yorkshire: Archaeological Desk-based Assessment, ASWYAS Report 1981

Webb, A. and Wilkins, I., 2009, Jackdaw Crag Quarry, Proposed Southern Extension, North Yorkshire: Geophysical Survey, ASWYAS Report 2002

Appendix 4: Flint Terminology

After Andrefsky 1998, xxi-xxvii and Butler 2005, 202-209

Core: Flint nodule from which blades or flakes are struck.

Flake: General term for fragments struck from cores. Flakes may be simply debitage (waste) or may be modified into cutting or scraping tools.

Blade: A flake with a length more than twice its width. A blade will also have parallel sides and have ridge(s) down the dorsal face.

Biface thinning flake: A distinctive type of flake produced during the manufacture of a bifaced tool such as an axe, a adze, a sickle or some types of arrowhead. Such flakes will exhibit a curved profile which follow the shape of the tool roughout. Negative flake scars on the dorsal face will be present, indicating the removal of flakes from around the edge of the roughout.

Bulb of percussion: The bulbar shape that forms on the ventral face of a flake or blade generally radiating out from the butt of the piece where percussion or pressure was exerted.

Butt: Term for the proximal end of the flake or blade. The butt may exhibit evidence of platform preparation on its dorsal face in the form of trimming.

Negative flake scars: The scar left on a core or the dorsal face of a flake, or from retouching, following the removal of a flake.

Arris (Ridge): Intersection of two negative scars on the dorsal face of a blade, flake or core.

Hinge termination: Distinctive rounded or hinged termination of flake or blade indicating not enough force was used when piece was struck causing the force to exit out through the face of the core.

Overshoot termination: Distinctive termination of flake or blade indicating too much force was used when piece was struck

Platform: The flat, natural or prepared surface on a core, which is struck in order to remove flakes or blades.

Cortex: The outer chalky skin on a flint nodule.

Primary: Initial flakes removed from a core (i.e. core preparation flake), primarily to remove the cortex and will therefore be fully or partially cortical on dorsal face.

Secondary: A flake or tool exhibiting less than 50% cortex on its dorsal face.

Tertiary: A flake or tool exhibiting no cortex.

Left and right lateral sides: Are defined by the butt of the piece pointing towards the viewer with the dorsal face uppermost.

Appendix 5: Osteological and Palaeopathological catalogue

Skeleton Number	1															
Preservation	Surface preservation = 4 (Poor); moderate fragmentation															
Completeness	45%+; half of frontal bone, half of left parietal, right parietal, occipital, both temporal, mandible, 85 cranial fragments, left clavicle, both humeri, both radii, both ulna, 27 arm fragments, both femora, right tibia, right fibula, acromion of left scapula, ilium of both sides of the pelvis, first cervical vertebrae, 3 thoracic spinous processes, 4 lumbar spinous processes, 1 sacral spinous process, 15 arch fragments, 3 lumbar fragments, 3 right ribs, 3 left ribs, 27 unisided shaft fragments.															
Age	35-45 years (young adult)															
Sex	Male															
Stature	Undetermined															
Non-Metric Traits	Parietal Foramen (L), metopic suture.															
Pathology	<p>Superior right process of a thoracic vertebra had osteophyte (slight) and porosity (moderate). A right inferior process of another thoracic vertebra had osteophyte (slight) and porosity (moderate). The left process of the same vertebra had porosity (slight). The superior process of a left lumbar vertebra had porosity (slight). The first cervical vertebra had aplasia on the right side and compensatory growth on the left side.</p> <p>The right acetabulum had slight porosity in the centre.</p> <p>Pronounced muscle attachments at the site of the hamstring on the right femur and at the deltoid of the left clavicle.</p>															
Dental Health	16 tooth positions, 26 teeth present, 5 teeth not present. Chipping on the left second pre-molar. Periodontal disease on both sides of the mandible (slight)															
	Right Dentition								Left Dentition							
Present	-	-	-	-	P	-	P	P	P	P	P	P	P	P	P	NP/U
Calculus	-	-	-	-	F d	-	S b	-	-	-	S d F m	-	H dl S B F m	F bl	M b	F b
DEH	-	-	-	-	-	-	-	-	-	-	L x 3	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S m	-
Wear	-	-	-	-	6	-	4	5	4	6	4	4	4	6	5	7
Maxilla	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8

Mandible	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Present	P	P	P	P	P	P	P	P	P	P	P	P	P	P	-	P
Calculus	M bd H l	M l F b	S bl S l	H b S l	S l M b	S bmd F l	F d	-	F bl	-	-	S bd	F b S d	F bm	-	S l H b
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	M m	-	-	-
Wear	7	6	7	5	5	2	4	6	6	4	4	5	5	7	-	6

¹ Sk, skeleton; GBA, general biological analysis; (n), number of fragments

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