

THE PEMBROKESHIRE CEMETERIES PROJECT

EXCAVATIONS AT WEST ANGLE BAY 2005-06



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FINAL REPORT

Gan / By

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Paratowyd yr adroddiad yma at ddefnydd y cwsmer yn unig. Ni dderbynnir cyfrifoldeb gan Ymddiriedolaeth Archaeolegol Dyfed am ei ddefnyddio gan unrhyw berson na phersonau eraill a fydd yn ei ddarllen neu ddibynnu ar y gwybodaeth y mae'n ei gynnwys

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SUMMARY

During the summers of 2005-6, two seasons of limited trenching and excavation were undertaken on the south side of West Angle Bay, Pembrokeshire (NGR SM 85 03) at the documented site of a later medieval chapel where cist burials had been observed eroding from the cliff-face. The project goal was to inform future strategies for the management of the archaeological resource.

Evidence of a substantial rectangular enclosure surrounding an oval cemetery compound was revealed. The cemetery compound was defined by two phases, the earlier of which was radiocarbon dated to 660-870 AD at the latest. The compound enclosed numerous intercutting burials. Eight of these were cist burials. All but one were immature individuals, the exception contained both an adult and a neonate. One of the immature burials was dated to 720-920 AD, while the adult was dated 900-1040 AD.

Apart from the burials within the cemetery compound, no further burials were encountered during the excavation. One of the cist burials eroding from the cliff face has been dated to 650-720 AD. This burial group appears to be contained within a substantial rectangular enclosure which was radiocarbon dated to 540-650 AD.

Geophysical survey suggests the compound also contains a rectangular building, which could not be excavated.

This report integrates both seasons of excavation and presents the results of carbon 14 dating, palaeoenvironmental sampling and human bone analysis.

This is clearly a site of great complexity that would reward further investigation.

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INTRODUCTION

Project background

This project emerged from the Cadw-funded Early Medieval Ecclesiastical Sites assessment (EMES) undertaken by Dyfed Archaeological Trust since 2002. The EMES formed part of a pan-Wales, Cadw grant-aided project, intended to redress a notable imbalance in the archaeological record for the period (Ludlow 2004). Following the EMES a number of coastal cemetery sites at risk from coastal erosion were identified, including St Ishmael's, St Brides and West Angle Bay (Ludlow 2002).

The site at West Angle Bay lies within the Pembrokeshire Coast National Park within view of a popular beach at NGR SM 85150305 and is one of 38 known or possible early medieval cemetery sites in Pembrokeshire. Over a number of years, visitors to the beach have noticed human skeletal material contained within stone-lined 'cist' graves, eroding from the cliff-face on the south side of the beach at NGR SM 85130309.

A visit to the site was made by Dyfed Archaeological Trust in 1997 to recover skeletal material eroded from three cist burials exposed in the cliff face (James 1997). This material was subsequently stored at Scolton Manor Museum.

In 2005, Dyfed Archaeological Trust were commissioned by Cadw and PCNPA to undertake an archaeological evaluation of the site to clarify its nature, extent and survival, with the aim of informing its future management. A second season of excavation was undertaken in 2006.

The project was grant aided by Cadw with support from the Pembrokeshire Coast National Park Authority (PCNPA), Cardiff University, and PLANED.

Project objectives

The goal of the project was to obtain information about the nature, extent and condition of the site, to inform decisions on the future management of the monument rather than an extensive investigation of an early medieval cemetery site. To this end, excavation was designed to minimize disturbance to known archaeological deposits (including human skeletal material), while maximizing the recovery of information on the deposition sequence and character of the site.

In 2005, the objectives were to ascertain and map the presence and extent of further burials or other features that might be at risk from coastal erosion, in order to establish the extent, spatial organisation and chronological range of the cemetery and any other associated elements. This information could then be used to prepare a comprehensive management plan for the site. In 2006, the objectives were to further clarify the findings of the previous season in the light of geophysical data unavailable in 2005.

In addition to the archaeological objectives, funding for an Outreach Officer was provided by 'PLANED'. This allowed an extensive programme of outreach work to be undertaken including a visit and participation by the local school, on-site presentations for the many visitors to the site, and archaeology 'taster sessions', allowing the opportunity of hands on archaeological experience.

Methodology

Standard archive sources for aerial photographic coverage, and documentary evidence held at the regional Historic Environment Record (HER) were consulted prior to commencement of the fieldwork. The site is not a Scheduled Ancient Monument (SAM), but is included within a Tir Gofal agri-environment agreement. The cliff edge is also a SSSI. Consequently prior consent to excavate was obtained from CCW.

In 2005, it had been intended to undertake a geophysical survey to inform the location of a series of hand dug test pits (Trenches 1-13). In the event, however, the geophysical survey did not take place. Consequently, the test pits were randomly located, primarily along the cliff edge, with the aim of encountering additional cist burials or other features.

Two trenches (Trenches 1 and 13) were enlarged using a JCB to investigate visible earthworks identified in the assessment area during the fieldwork.

In 2006, following a successful geophysical survey, more targeted trenching was possible to sample possible features and to further clarify the findings of the previous season. The constraints of the project, however, meant that it was not possible to sample excavate all features of potential archaeological significance. The rationale behind the trenches excavated in 2006 is discussed in the results section.

All archaeological features were hand-excavated, and recorded using the standard system employed by Dyfed Archaeological Trust. Plans and section drawings were drawn at 1:20 scale and excavated features photographed in digital and B/W format. The majority of the fieldwork was undertaken by local volunteers and by students from the University of Cardiff as part of an accredited archaeology degree course, all under the supervision of staff from Dyfed Archaeological Trust. All trenches were backfilled at the end of the excavation.

Excavation of human skeletal material was kept to a minimum, but a small quantity of excavated human bone was retained for osteological analysis. A small number of samples for phosphate and pollen analysis were also taken. Bulk soil samples for the recovery of charred plant remains and soil monoliths for pollen analysis were taken from a variety of suitable deposits. From these, small quantities of material for AMS dating were recovered. The results of the analysis of these samples are discussed in this report and presented as appendices.

Historical background

West Angle Bay in Pembrokeshire has long been recognized as the site of a coastal cemetery and chapel. Although other such sites are known in the region since none have been fully excavated, they are little understood.

The Anglo-Norman planned settlement at Angle was established by the late 12th century. The village has a characteristic central street with narrow plots running off at right angles, a concentration of high-status Medieval buildings (including St. Mary's church, a tower-house and dovecote) at the east end of the village, and a surrounding landscape of fossilized strip fields (James 2000). The church had become parochial by 1297 (Ludlow 2005a).

The site at West Angle Bay, which is approximately one mile west of Angle village, is considered to be a 'developed' cemetery site with an enclosed cemetery and a possible chapel (Ludlow 2002). There is no recorded dedication to a Celtic saint at the site. The field is labelled 'Old Church' on the tithe map of 1844 ([reference?](#)). An enclosure marked as a dotted line and labelled 'Burial Ground (Site of)', is identified on the Ordnance Survey 1st and 2nd Edition 1:2500 maps of 1879 and 1908 (Pembs. Sheet XXXVIII.8).

In his Historical Tour through Pembrokeshire of 1811, Fenton does not name the chapel at West Angle Bay when he writes '...to the west of the village in a field, to this day called Church Field, may clearly be traced the site of a chapel, or probably the original church, before the present was erected, called St. Mary's, as having a large cemetery extending to the shore below it, on who's shivery banks that bounded it, as they are gradually washed away by the tide, graves and stone coffins appear.' (Fenton 1811).

Laws and Owen in their 1908 Pembrokeshire Archaeological Survey, reported that the field contained a circular bank, standing about two feet high, that enclosed the burial ground and that part of the compound was divided off by a wall or stone-faced bank (James 1997). Elsewhere, however (see below), a remarkably similar description is attributed to the St. Mary's Chapel site, to the north of Angle village.

The RCAHM Inventory for Pembrokeshire (1925) suggests (with reference to Dr Henry Owen) that a chapel, dedicated to St Anthony was once present at Angle but was destroyed by coastal erosion some time before 1500. This suggestion is based on the wording of a will of one Richard Newton in 1500 (RCAHM 1925, entry no. 26) which bequeaths 'to the chapel of St George the Martyr of the Nangell four tenements in Haverfordwest and Pembroke, which lands of late appertained to the Chapel of St Anthony in the Nangle, and to the augmentation of the stipend of a priest always to sing for the souls of the founders of St Anthony, that is to say Edmonde Shelborn and his ancestors...'.

The RCAHM Pembrokeshire Inventory description (entry 26) does not mention the earthwork enclosure at West Angle Bay. The description of St Mary's Chapel (entry no. 27), however, appears to be remarkably similar to the Laws and Owen description of the West Angle Bay site, perhaps suggesting that somewhere along the line, the two sites have become confused.

An aerial photograph from the 1950s (Photo 1) shows part of the cemetery compound surviving as an extant feature, remarkably similar to the Laws and Owen description. An Ordnance Survey Field Inspectors description of the site at West Angle Bay in 1965, reports 'a small, near circular enclosure....raised on the

north side, while the remainder is defined by a low spread bank' (Regional HER). Agricultural activity since then has obliterated almost all surface evidence of this.

Also visible in the 1950s photo is a rectangular mound to the west of the cemetery compound, which may be a dump of stone derived from levelling of the cemetery compound. No evidence of this rectangular feature is apparent on the ground today. Locals recollect that stone 'from the chapel' was used to construct some porches on houses in Angle village. The rectangular feature may have been the source of this stone.

St. Georges Chapel is presumed to be the small 15th century building, sited within the churchyard of St Mary's church. The chapel, now known as the 'Fisherman's Chapel' or 'Sailor's Chapel', also bears an inscription above the door, reading 'This chapel is dedicated to St Anthony and was founded by Edward de Shirburn of Nangle AD1447', although the inscription is not itself of that date. The chapel of St George would therefore appear to have been re-dedicated to St Anthony. A note in the Pembrokeshire Inventory, however, quotes Glynne (Arch Camb, 1888, V, v 122) concerning the possibility that St. Georges Chapel was actually located inside St. Mary's Church itself.

To summarise, although there may have been a chapel at West Angle Bay, there is no direct evidence that the surviving cemetery compound is the chapel site, or that the chapel was dedicated to St Anthony. It is of course also possible that it is both, or that the cemetery compound is only part of a larger group of buildings, the actual chapel dedicated to St. Anthony having indeed been lost to coastal erosion.

Site description

The site is located on the cliff top on the south side of West Angle Bay, overlooking the beach. The site lies within a large, rectangular field that slopes downhill from 19.5m OD at its southern end, to 7m OD at the top of the coastal cliffs that form its northern end. The west side of the field is separated from the cliffs by a field boundary bank. The east side is defined by a stream. The Pembrokeshire Coast Path National Trail cuts diagonally across the field.

The cliffs at West Angle Bay are a SSSI, (32WWH) because they provide a section through Pleistocene deposits, making it one of the most important geological sites of this type in Wales. Although West Angle Bay is underlain by Carboniferous Limestone the excavation site itself is underlain by mudstones, siltstones, sandstones and conglomerates. Quaternary clay deposits occur to the east of the site. These clay deposits provided 'brickearth' for a brickworks formerly located to the east of the site, of which part of an old chimney are the only visible remains.

The field is currently subject to a Tir Gofal agri-environment agreement and is cropped for hay. The main part of the field has, in the recent past, been used primarily for grazing, but has apparently been ploughed for root crops during the earlier part of the 20th century.

Little surface evidence for the presence of archaeological features at the site can be discerned today apart from the low-lying remains of an oval bank in the mapped location of the cemetery. Human skeletal material contained within three stone-lined 'cist' graves, has been observed eroding from the cliff-face on the south side of the beach at NGR SM 85130309 (Photo. 2). Skeletal material from one of these burials was collected from the base of the cliff in 1997, from which an AMS carbon date of AD 650 to 780 (at 2 sigma calibration) was obtained (see Appendix 2, sample ref. Beta 229577).

Another group of possible cist burials has been identified eroding from the cliff in the far northwestern extremity of the site at NGR SM 8502 0312 (Photo 1). They appear to be small, and are possibly aligned north-south, but no skeletal material was visible, and excavation was not possible.

Together, the known features are suggestive of a complex polyfocal and multi-period site.

Geophysical survey

Prior to the second season of excavation, a geophysical survey of the field containing the known remains was undertaken by Stratascan Ltd. The entire field was subject to a gradiometry survey, with a resistivity survey of the cliff top area also being undertaken in an attempt to identify further potential cist burials. The full results and initial interpretation of these surveys are presented in a separate report (Heard 2006), although figures presenting the raw survey data and preliminary interpretations of the data are presented within this report.

The gradiometry and resistivity surveys (Figs. 3, 4, 5 and 6) identified a variety of features, with a varying probability of likely archaeological significance. The anomalies identified from the geophysical survey can be divided into the following groups:

North-south oriented linear anomalies

These features are assumed to derive from ridge and furrow cultivation. They appear to survive most clearly in the northern part of the site, but less substantial linear anomalies on the same alignment in the southern half of the site may be less well-preserved remnants of the same cultivation system. Alternatively, these marks could be of geological origin. No evidence of these features was visible on the ground surface and they were not targeted as an excavation priority.

East-west oriented linear anomalies

The majority of these features are assumed to derive from agricultural activity, although presumably from a different phase of activity to those on a north-south orientation. Alternatively, they may be of geological origin. No evidence of these features was visible on the ground surface and they were not targeted as an excavation priority.

Non-linear anomalies

These features, possibly indicating cut features or areas of disturbance were primarily located in the northeast corner of the survey area, where archaeological features are most concentrated. While possibly of archaeological significance, these features were not targeted for excavation.

Other less certain area anomalies in the southern half of the survey area may also be of archaeological significance. Trenches 1 and 17 were located to sample two such areas.

Features of likely archaeological significance

Both gradiometry and resistivity surveys identified several features considered more likely to be of archaeological significance. The most apparent features identified in the geophysical survey included the cemetery compound, the enclosure ditch and an east west aligned parallel ditched feature running across the middle of the field. Trenches 13, 14, 15, 16, 17 and 18 were located to sample and characterise these and other possible features (see Figs. 2 and 5).

Of particular potential significance was a possible rectangular building on an east-west alignment within the cemetery compound (see Fig. 6). This feature measures approximately 5m by 6m. Given the time and resources available, however, it was not possible to investigate this.

EXCAVATION RESULTS

Trenches cut in the 2006 season were numbered consecutively with those from the previous season. Trenches 1 and 13 from 2005 were reopened and extended in 2006 using their original trench numbers. The locations of all cut trenches and test pits are represented in Figure 2.

Only trenches that contained significant archaeological features are discussed in detail.

Trench 1 (Fig. 2)

Trench 1 (measuring 18m long, 3m wide and 1m deep) was first opened in the 2005 season. It was located on the eastern edge of a slight north-south earth ridge visible as an earthwork or undulation at NGR SM 8510 0300, possibly representing a plough-damaged field bank. No evidence of a field bank was identified. A number of small soil marks were observed in the natural at the western end of the trench. However, due to time constraints these features were not excavated.

The western half of the trench was re-opened in 2006 to characterize these features. A number of possible archaeological features were identified but on excavation these proved unconvincing and have been interpreted as animal burrows or root holes. Although no buried soil horizon was identified, a small flint thumb scraper was recovered when cleaning up the base of the trench.

Trench 2

Trench 2 (measuring 4m by 1.5m and 0.40m deep) was located at NGR SM 8514 0307. No archaeologically significant features were encountered. However a compact, black, gravelly layer of mixed stone, concrete fragments and a tarry substance appeared to represent a deliberate hard-stand of 20th century origin.

Trenches 3-5

Three test pits (measuring 2m x 2m, and from 0.3m to 1m in depth) were hand excavated at NGRs SM 8508 0306, SM 8508 0307 and SM 8507 0308. No archaeological features were observed.

Trench 6

Trench 6 was located at NGR SM 8513 0307. It was L-shaped in plan, measuring 9.6m east-west and 4.8m north-south, with an average width of 1.8m, and to a depth of 0.35m. No burials were encountered. However, a gravelly deposit in the northwest part of the trench appears to represent a hard-stand dating from the 20th century.

A struck flint flake was recovered from deposit 017 in a possible pit 018 at the east end of the trench.

With hindsight, the location of this trench would appear to coincide with an assumed northern continuation of the ditch excavated in Trench 15. No evidence of this feature was identified during excavation of Trench 6, but this need not suggest the ditch was absent.

Trench 7

Trench 7 was located at NGR SM 8510 0308. It measured 4m north-south, and 2m east-west, and was excavated to a depth of 0.45m. No burials were encountered, but a flint flake was recovered from fill 015 of cut feature 015 in the north-east corner of the trench.

Trench 8

Trench 8 was also located at NGR SM 8510 0308. It measured 4m north-south, and 2m east-west, and was excavated to a depth of 0.45m. No archaeologically significant features were identified.

Trench 9

Trench 9 was located at NGR SM 8508 0309. It measured 4.3m north-south, and 2m east-west, and was excavated to a depth of 0.35m. No archaeologically significant features were identified.

Trench 10

Trench 10, L-shape in plan, measuring 4m north-south and 3m east-west, and excavated to a depth of 0.35m, was located at NGR SM 8503 0312, hard-up against the east side of a 1m high field boundary bank. A linear hollow running along the east side of the bank was taken to be the silted remains of a ditch.

Trench 11

Trench 11 was located at NGR SM 8503 0310. It measured 8m north-south, and 1.7m east-west, and was excavated to a depth of 0.35m. No archaeologically significant features were identified.

Trench 12

Trench 12 measuring 6.9m by 1.3m, and 0.3m deep, was located at NGR SM 8509 0309. No archaeologically significant features were identified.

Trench 13 (Figs. 7-11, Photos. 8-23)

This trench was originally opened in 2005. In 2006 part of the original trench was reopened and extended northwards in order to confirm and clarify the findings of the previous season and to characterise the results of the geophysical survey. In total, Trench 13 was L shaped, measuring approximately 10m north-south, 8m east-west and 4m wide, and was excavated to a maximum depth of 1.2m.

Bank 045

In 2005, a spread of locally-sourced stones (045) ranging in size from small stones to very large boulders, was interpreted as a stone bank surrounding the cemetery. Although not a reliable context (because of the likelihood that plough disturbance may have introduced the bone from elsewhere), a radiocarbon date of AD 780 to 980 at 2 sigma calibration was obtained from a piece of human bone from this context.

In 2006 displaced and tumbled stones were systematically removed in order to clarify the character and construction of this feature. The stones of 045 appeared to be arranged in two concentrations or arcs separated by an earthen deposit (022). Initially 045 and 022 were interpreted as the plough-damaged remnant of

an earth bank with an exterior stone facing. Soil was removed in spits from the north side of the bank in an attempt to reveal the face of the stonework. This revealed a single course of possibly *in-situ* stonework. The stonework was characterised by the stones being slightly pitched downwards to the north, with alternate stones, apparently selected for their length, placed so as to key the stone face into the earth bank (see Photo. 15). It was not possible during the excavation to ascertain whether the interior arc of stones were the remnant of an eroded or plough damaged stone-facing on the inner side of the bank, although this seems entirely likely.

A section was cut through the bank material to clarify the sequence of construction of 045 and 022. While not entirely clear (due to plough damage) the resulting section (Fig. 11; Photos 18 and 19) supported the likely presence of a stone faced bank, but other tumbled stones revealed lower down in the section may suggest the presence of a collapsed stone structure pre-dating the stone-faced bank.

In the interior of the compound, the bank/wall remains survived to about 0.2m higher than the top of the majority of cist grave structures. Externally, however, the bank/wall remnants dropped markedly to a buried ground surface (242), suggesting that over time successive burials inside the compound have raised the interior ground level.

The geophysical survey clearly indicates a rectangular feature inside the cemetery compound (Fig. 2). Although it was not possible to excavate this feature in 2006, it is presumed to be a stone-built building with approximate dimensions of 4m by 6m.

Cut through the buried soil on the exterior of the compound boundary was a curving ditch (063/238) that appeared to follow the same course as the wall/bank remains 045 and 022.

Ditch 063/238 and bank 239/240 (Figs.9,10,11)

The excavation through the boundary bank of the cemetery compound also confirmed the presence of an earlier ditch (063/238) cut into the underlying natural shale and following the same line as bank 045. A possible bank (239/240) following the same line on the inside edge of the ditch was also identified. This ditch and bank may represent an earlier boundary around the cemetery compound, but the width and depth of the ditch (0.80m wide and 0.50m deep) does not suggest that it was a substantial feature.

Context 243 (the material overlying ditch 238) may be derived from the gradual collapse of a stone wall constructed on top of bank 239/240 which was replaced by the stone and earth bank 045 in a later phase. Plough damage has, however, destroyed or obscured clear evidence that could confirm this interpretation.

A prehistoric flint core recovered from a possible buried soil (241) below bank 239/240) had hinted that the bank and ditch 239 could be the remains of a prehistoric feature, that later became the focus of the cemetery compound, a phenomenon seen at other early medieval cemeteries in Wales. An AMS date obtained from charcoal recovered from fill 223 within the ditch provided a date at 2 sigma Cal of AD 660 to 870 (see Appendix 2, sample ref. Beta 229576), suggesting that the lower fill of the ditch and, therefore, the ditch itself are of early medieval origin. Results from the analysis of charred plant remains from the ditch fills are also consistent with an early medieval date.

Soil samples were taken for the recovery of charred plant remains from ditch fills 223 and 221. From the lower fill (223) there was some evidence for emmer/spelt

wheat (a spikelet fork) and for oat (a floret base) and barley. Dock (*Rumex* sp.) and grass (Poaceae) seeds may indicate grassland/cultivated land and a gorse spine (*Ulex* sp.) suggests scrub growing in the area. The remains may represent waste from a fire that had been deliberately deposited in the ditch or remains that had been blown or washed into it.

The sample from the upper fill (221) produced oat and barley grains and bread wheat grains. A possible bristle oat (cf. *Avena strigosa*) floret base and a bristle/common oat (*A. strigosa*/*A. sativa*) type floret base were recovered. It is therefore probable that the oat represents a crop rather than a weed. It is also possible it could have been grown with barley as a mixed crop (drage), rather than as a single crop. Mixed crops were frequently sown in case of failure of one of the crops. Alternatively, the oat might have been a weed of the barley crop and deliberately allowed to grow in the fields and harvested with the barley. Wood charcoal was quite frequent in the sample and the remains suggest the deliberate dumping of waste from a domestic fire in the ditch. These results suggest that crop processing or other domestic activities may have occurred in the vicinity of the ditch.

The burials (a full analysis of skeletal material is not yet not available)

Removal of plough soil 038 from the interior of the cemetery compound revealed evidence of 8 cist burials (050, 067, 039, 035, 043, 245, 059, 211 and 247) and two possible cist burials (245 and 068) located wholly or partially within the excavated area. Burial 055 did not appear to have a cist structure. Several of the burials exhibited evidence of intercutting, although plough damage, bioturbation and soil characteristics conspired to make grave cuts difficult to distinguish.

There was no evidence to suggest that ditch and bank 283 and 240 cut, or were cut by, any burials. Likewise, there was no evidence to suggest that bank 022/045 sealed, or was cut by, any burials. The density of burials, however, has resulted in a gradual rise in the ground surface inside the cemetery compound, so that the latest burials are at a higher level than the base of the later stone-faced bank.

The cist graves all utilised rough slabs of locally obtained rock. In all cases cist structures consisted of side slabs, but no basal slabs. Some cists also had capstones, others did not. Due to the proximity of the burials to the present ground surface there was considerable displacement of stone and human bone through plough damage. The absence of capstones may be a result of plough damage, rather than burial practice.

The effects of plough damage, bioturbation, deposition and soil conditions all conspired to make bone preservation poor, hampering the excavation and recovery of diagnostic skeletal material. Various fragments of redeposited human bone were also recovered during the cleaning and excavation of the bank material, but these are considered most likely to be present as a result of plough damage, rather than the remains of *in-situ* burials.

Cist 050, Burial 049, Cut 051

A southwest-northeast aligned cist burial represented by side- and lintel-slabs, but with no apparent basal slabs. Only its eastern half lay within the excavated area. The apparently displaced inhumation was much-decayed with only ribs clearly identifiable.

Cist 039, Burial 040/053, Cut 033

A southwest-northeast aligned cist represented by side-slabs and lintel-slabs, with a foot-slab at its east end. Its west end was truncated by the initial machine-dug trench and this, coupled with its obscure grave-cut and displaced slabs, mean that only its width (0.40m) and depth (0.30m) could be ascertained. The cist contained an inhumation comprising cranium, with mandible and teeth, 4-5 ribs (RH), both femorae, and both tibiae and fibulae. Based on dentition, an age of around 5 years has been attributed to this individual. Although the (intrusive?) worn dentition of an adult were also recovered. Samples of the long bones were taken for dating. A 2 sigma calibrated radiocarbon date of AD 720 to 740 and AD 760 to 960 was obtained from this material.

Cist/Cut 067, Burial 066

Aligned southwest-northeast with only the eastern end within the trench. The grave-cut was clearly visible in the section and was 0.40m wide, but it was not bottomed. There appear to have been neither side- nor basal-slabs, but a flat stone seen in the section may be a lintel slab. Fragments of cranium, mandible and teeth were observed within the section, suggesting either that the burial originally extended further into the trench, or that the inhumation has been displaced. The width of the cist may suggest an infant burial.

Cist 035, Burial 056, Fill 034

A well-preserved east-west aligned cist burial with roughly dressed side-slabs and end-slabs but no basal slabs. The dimensions of the cist were 1.1m long, 0.3m wide and 0.3m deep. No skeletal material survived within the cist, but its dimensions suggest this was probably a child inhumation.

Cist (043/218), Burial 042/220, Fill 041/214. Cut 044/219

This burial lay on the eastern edge of the trench running beyond the eastern edge of the excavated area. It appears to have occupied a distinct grave cut, averaging 0.7m in width. Only the western 1.3m of the grave was revealed. Two side-slabs and lintel-slabs survive *in-situ* at the western end, the rest having been displaced by ploughing, and possible truncation by a later burial cut 055. As elsewhere, there was no evidence of basal slabs. Human remains were limited to one mandible, located at the west, least damaged end of the grave. An age of 1 or 2 years has been attributed to this individual.

Cist 059/231, Burial 215 Cut 232

This burial had one surviving *in-situ* lintel-slab and several side-slabs at its western end, with no surviving cist stones at its eastern end. The inhumation was represented by a number of bone fragments lying within a poorly defined cut that was roughly 0.40m wide; the skull and mandible were much decayed the remains of both femorae and one fibula were identifiable. Other bone included possible fragments of clavicle, hyoid and radius. Dentition from this grave suggests an individual of 5 or 6 years, but other dentition from the same context (intrusive?) suggests an adult individual.

Cist 211, Fill 210, Cut 212

This cist was virtually intact, measuring 1.95m long, 0.75m wide and 0.25m deep, it comprised side slabs and lintel slabs, with no basal slabs.

The fill of this cist grave was notable for the inclusion of several small rounded quartz pebbles, that if not obviously placed with the burial, would appear to be alien to the soil in the vicinity of the site.

The inhumation comprised an articulated adult skeleton (with head to west) apparently placed on its left side (i.e. facing north). Only major bones survived: skull, long bone fragments, femur, tibia, humerus and ulna, along with rib,

vertebra and clavicle fragments. The inhumation provided an AMS carbon date of AD 900 to 920 and AD 950 to 1040 (at 2 sigma calibration) (see Appendix 2, sample ref. Beta 229575).

The sieved grave fill also yielded nine bones and a tooth of a neonate, these are considered unlikely to be intrusive, suggesting that the neonate was present in the original burial. The presence of the neonate may also explain the positioning of the adult inhumation. Also recovered from the sieved fill were three teeth of a 10-12 year old, and other bones possibly from two other individuals. These are all most probably intrusive.

In addition the fill was distinguished from other excavated contexts and grave fills, at the site by the inclusion of relatively large amounts of charred plant material. The assemblage included wheat, barley and oat but grain was relatively scarce, as were weed seeds. There was some slight evidence for the presence of glume wheats in the form of a glume base, and a possible emmer grain. However, most of the remains in the assemblage consisted of a range of material from woody plants including a thorn of blackthorn, gorse spines, and other thorns, bracken, birch, oak and cherry, along with hazelnut shell fragments and seeds of bramble, wood sage, corn or water mint, and violet. All these species indicate the presence of scrub woodland or hedges in the area, from which fuel for a fire could have been collected. It is also possible that brambles and hazelnuts were being gathered as foodstuffs. This could indicate a continuation of the practice, dating from prehistoric times, of the utilisation of wild resources for food.

The woody tissue often survived in large fragments, suggesting it had been intentionally or accidentally deposited within the grave, from close by at the time of burial. This may suggest evidence of a burial ritual.

Cist 247

This burial was only represented by the truncated remains of a cist structure. Only the north and east side and end-slabs survived, the rest of the structure and its inhumation having been truncated by cut 212 of cist structure 211. Although not complete, the cist structure was probably sufficiently large to suggest an adult burial.

?Cist 245

An unexcavated cist grave for a probable juvenile inhumation (based on the apparent size of the cist).

?Burial Cut 055, Fill 054

Located in the southeast corner of the site, this possible grave cut appeared to truncate burial 043. It was 0.45m wide but ran beneath the edge of the section. Possibly a child burial.

?Burial Cut 213

Following the excavation of cist grave 211, the cut of an unexcavated probable burial was revealed to have been truncated by grave cut 212. This earlier burial was not excavated.

Burial 217

Fragments of two femorae truncated by cist burials 211 or 247, were recovered from the eastern trench edge. Although these were not diagnostic, dentition recovered from the vicinity suggested a 1 year old individual.

Stray bone

Some additional concentrations of human bone may represent the vestiges of former burials or bone displaced from elsewhere. Context 203 was represented by

juvenile dentition. Context 060 was represented by skull and mandible fragments suggesting a 4 year old. No cut was discernible, and the bones were located within the upper parts of the stone and soil of the cemetery compound boundary (045) which have been subject to considerable plough disturbance. Human bone fragments recovered from 045 are therefore considered to be intrusive. Context 053 was a poorly preserved concentration of skull mandible and ribs of an adult (based on dentition), not located within a visible cut, and probably redeposited or plough disturbed.

Cliff edge cist burials

In addition to the burials within the cemetery compound, three cist graves consisting of side-slabs and lintel-slabs, and with no basal slabs have been identified eroding from the cliff face to the north of the cemetery compound (Photo 2). While not proven archaeologically, these burials would appear to be located within the rectilinear enclosure. Skeletal material from one of these burials was collected from the base of the cliff in 1997, from which an AMS carbon date of AD 650 to 780 (at 2 sigma calibration) was obtained (see Appendix 2 sample ref. Beta 229577). Further excavation was not possible.

Skeletal analysis has identified fragments of humerus, femur, skull, dentition, vertebrae, scapula, ulna, rib and sternum. Bone robustness and heavily worn teeth suggest an adult male of over 55 years.

Another group of possible cist burials has been identified eroding from the cliff in the far northwestern extremity of the site at NGR SM 8502 0312 (Photo. 1). They appear to be small, and are possibly aligned north-south, but no skeletal material was visible, and excavation was not possible.

Other features in Trench 13

Context 047 was a shallow (0.07m) concave, circular (0.60m) cut of unknown significance, filled by a barely differentiated fill (046). Cut 057 and fill 036, may represent a similar feature to 047, again of unknown significance. Cut feature 070 0.4m east-west and 0.10m deep and containing a few small-medium stones, was seen in the southern section of the trench.

Trench 14

This trench, measuring 8m by 2m and excavated to a maximum depth of 0.45m, was cut in order to ascertain the presence or absence of a possible second cemetery compound suggested by interpretation of the geophysical survey. If such a compound were present, the burials that are eroding out of the cliff face on the northern edge of the site would be contained within its interior.

No evidence for a ditch cut or banked enclosure was identified within the trench. Two features that might have been burials were investigated but were found to be natural features.

Trench 15 (Fig. 12)

This trench measured 5m by 6m and was machine excavated to the top of the natural, 0.25m below ground level. The trench was located to reveal the apparent intersection of two ditches identified from the geophysical survey, in order to ascertain the sequence of their construction. Natural shale bedrock was encountered immediately below the plough soil. A linear cut 230 was apparent running north-south through the trench.

The anticipated east-west ditch cut (a continuation of the possible cemetery compound ditch sought in Trench 14) was not present. A change in the form of the natural shales in the anticipated location may account for the geophysical anomaly. A possible silt-filled linear cut feature observed close to the northern trench edge, prompted the trench to be extended by 1m to the north. On excavation, however, the feature turned out to be a fissure within the natural geology.

Two sections were cut through ditch 230. It was found to be roughly v-shaped in profile, becoming more vertical where cut through solid shale bedrock. The ditch was 2.60m wide and was 1.50m deep from the ground surface, with a level base. A very small fragment of ?horse tooth and some small fragments of oyster shell were the only finds recovered.

Bulk soil samples were taken for the recovery of charred plant remains. Only one indeterminate cereal grain was recovered from ditch fill 229. From ditch fill 209 emmer/spelt glume bases, oat awns and a few weed seeds including stinking chamomile (*Anthemis cotula*), a weed typical of arable land and waste ground, and heath grass (*Danthonia decumbens*), which is commonly found on heaths on sandy or peaty soils. The presence of stinking chamomile might indicate the cultivation of heavier soils in the area. Ribwort plantain (*Plantago lanceolata*) was also present in the sample and this is found in a wide range of grassy habitats, as well as open, cultivated land. The weed seeds could represent crop-processing waste dumped directly in the ditch from a domestic fire, or midden waste that had been spread on the land as manure and had then fallen into the ditch.

An AMS date of AD 540 to 650 (at 2 sigma calibration) was obtained from basal fill 209 (see Appendix 2 sample ref. Beta 229574).

Trench 16

This was a hand-dug test pit measuring 2m by 2m, and excavated to a depth of 0.8m. It was located to test a geophysical anomaly that might indicate a cist burial close to the cliff edge. In the event, no such feature was found to be present.

Trench 17

This hand-dug trench, measuring 8m by 2m and excavated to a maximum depth of 0.4m, was cut to sample a geophysical anomaly interpreted as being of possible archaeological origin. No features or deposits of archaeological origin were identified. It later transpired that the trench had been erroneously located. On the evidence of similar anomalies in the area of Trench 1, however, it is probable that the anomaly was not of archaeological origin.

Trench 18

This was an additional hand-dug trench measuring 7.5m by 1m and excavated to a depth of 0.25m. The trench was located to sample a strong geophysical signal suggesting two parallel ditches running across the site on an east-west alignment.

Immediately below the ploughsoil, two parallel ditches were indeed located, cut into the natural shales. The ditch fills contained several large stones. The features have been interpreted as most likely to represent a ditched trackway, primarily because the distance between the ditches (3.0m) seems too wide for their alternative interpretation as a double-ditch-and-bank field boundary. There is no surviving evidence of metalling or rutting to support the track hypothesis, and no

evidence of bank material or root activity from hedges or trees. In both cases, any such evidence is likely to have been ploughed out by later agricultural activity. No dating evidence was recovered from the ditch fills.

The stratigraphic relationship between the trackway and the enclosure ditch to the east could not be ascertained in the excavated location. Scrutiny of the geophysical survey data, however, suggests that where the two features intersect, the enclosure ditch cuts through the trackway. In addition, deposits or activity within the enclosure would appear to obscure the eastward continuation of the trackway. Alternatively, the parallel ditches may indeed be a field boundary that terminates at the edge of the enclosure ditch, perhaps suggesting the two features are contemporary with each other.

A sample from ditch fill 222 yielded some evidence for wheat, including glume wheats, as well as barley and oat. The cornfield weed, corn marigold (*Chrysanthemum segetum*) was also present. The remains could represent waste used as manure on the fields.

FINDS AND SPECIALIST ANALYSES

No animal bone, ceramics, objects or other small finds were recovered during the excavation. Four pieces of worked flints were recovered:

Flint

Trench 1

Unstratified– small flint thumbnail scraper from flint pebble flake. 16mm long, 15 mm wide, 4mm thick. The cortical platform is incorporated into the abrupt retouch forming the working edge. Unpatinated.

Trench 6

Context 017 - Secondary flint flake from a pebble. 42mm long, 35mm wide and 10mm thick. 50% cortex on dorsal surface.

Trench 13

Context 233 - Core from a flint Pebble. 25mm long, 23mm wide and 19mm thick. Single platform, conical type core, not carefully prepared, retaining a small area of cortex. Moderately patinated.

Trench 7

Context 014 – Secondary flake from a flint pebble. 35mm long, 25mm wide and 10mm thick. 50% cortex on dorsal surface. Lightly patinated.

Interpretation

Although flint is not present in the local geology the raw material is certainly small in size and may have been collected from local beaches. Although a non-diagnostic assemblage, the thumbnail type scraper suggests a possible Neolithic/Bronze Age date, while the form of the core, although not typical, may suggest a Mesolithic or Neolithic date.

AMS Dating

The following AMS carbon 14 dates were obtained from samples taken during the two excavation seasons. Calibration graphs for these samples are included as Appendix 3.

SAMPLE	ANALYSIS	MATERIAL	CONVENTIONAL RADIO CARBON AGE	2 SIGMA CALIBRATION
Beta - 208267 Context 040	AMS	Bone	1190 +/- 40 BP	Cal AD 720 to 740 AND Cal AD 760 to 960
Beta - 208268 Context 045	AMS	Bone	1160 +/- 40 BP	Cal AD 780 to 980
Beta - 229574 Context 209	AMS	Charcoal	1460 +/- 40 BP	Cal AD 540 to 650
Beta - 229575 Context 210	AMS	Bone	1040 +/- 40 BP	Cal AD 900 to 920 AND Cal AD 950 to 1040
Beta - 229576 Context 223	AMS	Charcoal	1270 +/- 40 BP	Cal AD 660 to 870
Beta - 229577 Cliff edge cist	AMS	Bone	1310 +/- 40 BP	Cal AD 650 to 780

All the AMS dates obtained fall within the accepted range for the Early Medieval period, although radiocarbon dating for this period can be of variable reliability due to a plateau on the calibration curve, which can produce wide distributions of radiocarbon dates (Petts 2002, 27).

In retrospect, sample/context 045 is from redeposited bone in an unreliable context subject to plough damage. Dates obtained from *in-situ* burials are the most reliable contexts, but burials 040 and 210 have a wide potential date range. Samples from the ditch surrounding the cemetery compound (223) and the outer perimeter ditch (209), are from basal ditch fills, and do not therefore necessarily provide a secure date for the original cutting of the ditches, which could theoretically have been earlier features that were cleaned out and re-used in the Early Medieval period.

At face value, however, the outer perimeter ditch (230) is the earliest feature, with a date range that does not overlap with the other dated features. The cliff - edge burial could be earlier than the burials within the cemetery compound, although there is a 60 year date overlap with earliest potential date for burial 040 from within the compound. Burial 210 is significantly later than the cliff edge burial and is potentially later than burial 040, despite a 60 year date overlap.

Plant remains

Bulk samples for the recovery of charred plant remains were taken during both seasons of excavation. The charred plant remains provide evidence of domestic or agricultural activity in the area of the cemetery. The assemblage from 209 differs from that from the other samples by the absence of barley, frequency of glume wheat chaff, and limited evidence for oat. From the upper fill 221 of the cemetery ditch there is evidence for bread wheat. These results provide possible evidence for a change from the cultivation of glume wheats to bread wheat, hulled barley and oats. Hints of this change have been recorded at the end of the Roman period at other sites in West Wales, for example Llawhaden (Caseldine and Holden 1998) and Great Castle Head, Dale (Caseldine 2002). However, it appears that glume wheats, emmer/spelt, may have continued to be grown in the West Angle area, although they could have been 'weed' contaminants.

Alternatively, it is possible that the glume wheat evidence is residual and relates to an earlier, prehistoric phase at the site, perhaps supporting a prehistoric origin for the enclosure ditch.

A small amount of charcoal was identified from the site. Oak (*Quercus* sp.) hazel (*Corylus avellana*) and blackthorn (*Prunus spinosa*) were recovered from a blackthorn (*Prunus spinosa*). wild cherry (*Prunus* spp.), birch (*Betula* spp.), oak (*Quercus* spp.) and ivy (*Hedera helix*). These results suggest the presence of scrub woodland or hedges in the area.

The full results of the analysis of this material are presented as Appendix 1.

Soil monoliths

Monoliths tins were used to take soil profiles through a possible buried soil beneath bank material 240, for the analysis of pollen. An assessment of the deposit, however, proved negative, suggesting soil conditions have not been favourable for pollen preservation.

Discussion

The enclosure ditch

Ditch 230 forms the southwest corner of a rectangular enclosure, with rounded corners. The original size of the enclosure is unknown since an unknown proportion of the site has been lost to coastal erosion. The north-south enclosure ditches may have continued to the cliff edge in antiquity (as they would appear to today) rather than the enclosure having a northern ditch. It is assumed that the stream that forms the field boundary today runs along, or forms, the eastern side of the enclosure. A gap at the east end of the east-west axis of the enclosure ditch (visible on the geophysics plot) may suggest an entrance way into the enclosure.

No evidence for a bank on the inside of the ditch was apparent, either as a contour, or cropmark, and none was apparent during the excavation. All evidence of such a feature (if one existed) has presumably been destroyed by later agricultural activity.

Based on the AMS date of AD 540 to 650 (2 sigma calibrated) obtained from the basal fill 229, the enclosure ditch would appear to be of early medieval origin. The possibility that the enclosure ditch may be a prehistoric feature that was re-used for the establishment of the early medieval cemetery cannot, however, be discounted on the grounds of the early medieval date obtained from its basal fill alone. Although the width and depth of the ditch are considerably less than might be expected for an Iron Age or Roman period defended enclosure. At present, insufficient is known about other early medieval coastal cemeteries in Pembrokeshire to know whether the large rectangular enclosure containing a smaller cemetery compound found at West Angle Bay represents a regional type with which other sites can be compared.

The presence of emmer and spelt glume wheats in enclosure ditch fill 209 may be residual evidence of a prehistoric activity at the site. The small number of worked flints recovered during the excavation, may also suggest this. Alternatively, the presence of glume wheats may indicate that these crops continued to be grown in the West Angle area, either as crops or 'weed' contaminants, into the early medieval period. The excavated sections through the ditch fills (see Fig. 12) show no evidence of re-cutting or clearing out events, instead suggesting a periodic gradual infilling (relating to agricultural activity?) rather than a single backfilling event.

With the exception of the cemetery compound and the cist burials eroding from the cliff edge, it has not been possible to ascertain whether other archaeological features are present within the enclosed area.

It is probable therefore that the rectilinear ditch was cut in the early medieval period to define an enclosure in which burial took place. Within this enclosure, at least one cemetery compound was subsequently constructed. How much land has been lost to coastal erosion since the enclosure was first defined is unknown, but burials have been recorded eroding from the cliff edge since at least the early 19th century (Fenton 1811).

The cemetery compound

The cemetery compound was first located in 2005, but until the geophysical survey data was available, it was not possible to appreciate its extent and associations with other features.

The cemetery compound is approximately 20m wide, 25m long and appears to be roughly egg-shaped, defining an area of approximately 400 square metres. At its narrow (northeast) end, geophysical evidence may indicate a rectangular east-west aligned building, approximately 5m by 6m (see Fig. 2), although it was not possible to confirm the presence of a building during the excavations.

The Pembrokeshire Archaeological Survey (Laws and Owen 1908) reported that the field contained a circular bank that enclosed the burial ground standing about two feet high and that part of the compound was divided off by a wall or stone-faced bank. An aerial photograph taken in the 1950' shows part of the cemetery compound still surviving as an extant earthwork (Photo. 1), but little or no trace is visible today. The reference to a dividing wall or stone-faced bank within the cemetery compound is interesting on two counts. Firstly, it may refer to an extant remnant of the possible building identified by the geophysical survey, secondly it corroborates the excavated evidence for a stone-faced compound boundary bank within Trench 13.

The excavated evidence suggests up to two possible phases of cemetery compound boundary, although further excavation would be needed to confirm this. The first phase consists of a ditch and bank, possibly topped with a stone wall. In the second phase this appears to be replaced by a stone-faced earth bank. There is no evidence for burials having been truncated by construction of either phase of the compound boundary. This suggests that all the burials in this group post-date the initial construction of the cemetery compound.

AMS dating and the analysis of plant remains suggest that the ditch is of early medieval origin. Further excavation would be required to ascertain if a prehistoric feature formed the original focal point for the early medieval cemetery as it did elsewhere in Wales, for example at Arfryn and Llandegai (both Gwynedd) and Plas Gogerddan (Ceredigion).

The nature of the possible rectangular building within the cemetery compound is unknown. The possibility of two phases of cemetery compound boundary, may suggest that the building was added in the second phase. Alternatively, the building may represent a third phase added in the later (post conquest) medieval period, as is suggested by the non-celtic dedication of St Anthony that is attributed to the site.

Construction of a late medieval stone-built chapel could have occurred after formal burial had ceased, but while a tradition of sanctity was still attached to the site at West Angle Bay. There is no excavated evidence to suggest later medieval burial at the site: the latest date for burials suggested by AMS dating is AD 1040. Later burials may never-the-less exist in the unexcavated parts of the cemetery compound.

Indeed, following the establishment of the Anglo-Norman planned settlement at Angle by the late 12th century, burial at West Angle would be unlikely once sole burial rights were exercised by the church of St Mary's which had become parochial by 1297 (Ludlow 2005a).

How St Anthony's Chapel and St Mary's Chapel (another later medieval chapel with possible early medieval origins, located to the north of Angle village at

Chapel Bay) would have related to the church of St. Mary's and St. Georges Chapel (thought to have been constructed later than St Mary's church and to have been re-dedicated to St Anthony in 1447) is unclear.

The burials

At present, three groups of burials have been identified at West Angle Bay.

Burials beyond the enclosure ditch

Four potential cist burials have been identified eroding from the cliff edge to the west of the enclosure at NGR SM 8502 0312 (Photo 2). They appear to be small, and are possibly aligned north-south.

No skeletal material was visible and it has not been possible to confirm the nature of these features by excavation or to date them. Without knowing if these possible burials are later than, earlier than, or contemporary with the burials further to the east, it is difficult to assess what they might tell us about the spatial and temporal development of the site.

They may be pagan and early burials, or infant or late burials. They may represent burial in 'wild, isolated places' that characterised early post-Roman burial in other parts of western Britain (Preston-Jones 1992, 122). Alternatively it was not unknown for unbaptised infants, who did not qualify for burial in the churchyard, to be buried at old burial sites that had gone out of use for the rest of the population (James 1987; Page forthcoming).

The results of the first season of excavation and the geophysical survey did not identify any other burials in this group or elsewhere. The possible existence of further burial groups outside the early medieval rectilinear enclosure cannot, however, be discounted.

Burials within the enclosure

Three cist burials have been recorded eroding from the cliff-edge within the area of the enclosure in recent times, although burial erosion has been noted at the site since at least the early nineteenth century (Fenton 1811). How many burials may have been lost to coastal erosion since the foundation of the cemetery is unknown.

All three burials were cist graves, cut through the subsoil, into the underlying shale bedrock, with evidence of side-slabs and lintel-slabs, but no basal slabs. They appear to be properly oriented east-west.

Although it has not been possible to demonstrate by excavation, it seems probable that this burial group post dates, and is contained within, the rectilinear enclosure ditch. The single AMS date obtained from this burial group was AD 650 to 780 (2 sigma calibrated). The later of these dates overlaps with the burials inside the cemetery compound, while the earlier date overlaps with the rectilinear enclosure ditch. The burials may be restricted to the northwest corner of the enclosure, but earlier, and later burials may also have been lost to coastal erosion. No further burials in this group have been identified by excavation or geophysical survey and they may be the last remnants of this burial group within the enclosure.

Burials within the cemetery compound

It was noticeable that within the excavated area, several of the burials were orientated to follow the arc of the boundary bank rather than being orientated properly east-west, perhaps suggesting that available space for burial within the compound was limited towards the end of its use.

AMS dating of the excavated burials ranges between AD 720 and AD 1020 (at 2 sigma calibration). As yet unexcavated more deeply stratified burials might provide earlier dates.

The majority of excavated burials appear to have been cist burials with lintel-slabs, side-slabs and end-slabs (but no base-slabs, despite the burials not being cut into natural bedrock). These cist structure elements were not present in all cases, being present or absent either by design, re-use in later cist burials, or through different degrees of plough damage. In comparison to cist graves excavated at Brownslade barrow (Hughes 2007), the graves at West Angle Bay are generally less well constructed, from smaller stones. This may however be a consequence of the qualities of the stone available to hand at West Angle, rather than a result of differences in burial tradition.

Plough damage and the quality of bone preservation has meant that the number of identifiable individual articulated skeletons is very small and, considering the proportion of the cemetery that was excavated, it is too small a sample to allow statements about the pathology, age and sex of individuals within the burial population.

It is, however apparent that most of the discernable grave cuts, cist structures and surviving skeletal material suggest that the majority of the excavated inhumations were infant burials. Burial 210, however, was relatively well preserved and contained an adult and a neonate.

Whether this part of the cemetery compound was specifically chosen for the burial of infants, or whether there was a period of increased infant mortality towards the end use of the cemetery, is unknown. Another possible explanation is that the cemetery was re-used in the manner of a *cilleen*, or infant burial ground, as occurred in otherwise disused cemeteries in early medieval Ireland and possibly elsewhere in Wales (Page, forthcoming). It is unclear whether Burial 210 (which contains an adult and a neonate burial), reflects an association of the cemetery with infant burial, or refutes this possibility. If the building within the cemetery compound is a later medieval development, it would post-date the use of the cemetery for infant burial.

The reasons for the establishment of three groups of burials also remains uncertain. The AMS dates for both groups within the enclosure overlap, although the cliff edge group within the rectilinear enclosure may be earlier than the latest burials in the oval cemetery compound group. Changes in burial practice over time, specific age, gender, kinship, status or community groupings, or preference based on other unknown criteria, are all possible explanations.

The ditched trackway

Assuming that the features excavated in Trench 18 are a ditched trackway and not a field boundary, begs two questions: to what period might they be attributable, and where might the track lead?

In the absence of dating evidence, the only other available evidence is from the geophysical survey data. The alignment of the trackway in relation to the enclosure (Fig. 3), and the lack of evidence for an entrance into the enclosure, may suggest that the two features are not contemporary with each other. The trackway appears to be interrupted by, and therefore to be earlier than the enclosure boundary.

Construction of the enclosure ditch and bank may have masked or destroyed

evidence of the continuation of the trackway eastwards. The enclosure boundary has been tentatively dated to the early medieval period; could the trackway therefore date from the Romano-British period? Whether the trackway provided access to fields or to a coastal feature that has been lost to erosion remains speculation. If the trackway is in fact a field boundary, then it could be contemporary with the enclosure. Further excavation would be required to ascertain the relationship between these features.

Prehistoric activity

Although prehistoric activity in the area is suggested by cut features and deposits containing struck flints, the character and extent of prehistoric activity in the area remains unclear. The flint evidence, and trackway nevertheless suggest that there was activity in this location prior to the establishment of the enclosure. The charred plant assemblage recovered from the enclosure ditch, may also suggest prehistoric activity in the area.

Agricultural activity

The results of the geophysical survey provide possible evidence for several phases of agricultural activity at West Angle Bay. Some of these geophysical features may, however, be derived from patterns in the underlying geological deposits.

One set of probable plough marks run on a roughly east-west alignment, parallel to the trackway on its northern side. In the southern part of the field, are further possible ploughmarks on a roughly east-west alignment (see Fig. 4). Neither set of east-west aligned plough marks appear to extend into, or survive within, the enclosure, perhaps suggesting they are earlier than or contemporary with the enclosure.

At least one group of possible cultivation marks is also present on a roughly north-south alignment. These marks may be associated with the north-south aligned bands visible on the resistivity plot. These marks appear to extend into the area of the enclosure, suggesting they are later than it. Until recently the field was used for potato cultivation, which may account for the north-south aligned cultivation marks.

CONCLUSIONS

Archaeology

The excavations at West Angle Bay have provided important information on the nature and character of the early medieval cemetery and confirmed the existence of significant archaeological features beyond the confines of the cemetery compound.

Although the results from the excavations are necessarily limited both by available resources and the original objectives of the excavation, a considerable amount of information has been recovered, This has perhaps resulted in more questions being raised, than have been answered. The following development events are suggested, but their chronology remains uncertain:

Event 1

A possibly unenclosed cist burial group at the western extremity of the site. The date of these features is not known, they may be earlier or later than the other burial groups to the east.

Event 2

The establishment of an early medieval rectilinear enclosure (possibly re-using an existing prehistoric enclosure). From the available dating evidence this may have happened from AD 540. It is unknown how large the enclosure was, how many burials it contained (other than the three eroding from the cliff-face), or what other buildings may have been lost to coastal erosion.

Event 3

The establishment of a formalized sub-circular burial plot (the cemetery compound) within the rectilinear enclosure. This consisted of a shallow rock-cut ditch with a bank, possibly topped by a stone wall. How it relates, chronologically, to the rectilinear enclosure is unclear without further excavation.

Event 4

The construction of a stone-faced earth bank around the cemetery compound, replacing the earlier boundary. This may mark a consolidation, refurbishment, or the end of a period of abandonment.

Event 5

The possible use of the cemetery for infant burial in the later stages its use or after a period of abandonment. This appears to post date Event 4.

Event 6

The construction of a building within the cemetery compound. As yet, there is no direct evidence to suggest what this building is, or when its may have been built. It may be earlier than, contemporary with or later than Events 3, 4 or 5. The building may or may not be St Anthony's chapel.

Event 7

The abandonment of the cemetery compound. From the available dating evidence this may have happened by AD 1020 (the latest date for the latest excavated burial).

Event 8

The establishment of An Anglo-Norman period planned settlement with church (St Mary's) by 1291, and chapel (St. Georges) possibly at a later date. These are presumed to have replaced the ecclesiastical functions of the other religious sites in the area.

Monument management

From a monument management perspective, the excavation has demonstrated that significant archaeological features that are important to the context and understanding of the site, exist beyond the cemetery compound. Better understanding of the character of the cemetery compound has clarified the impact of the destructive processes that have occurred to date, and the likely implications of future threats.

The upstanding remains of the cemetery compound having been entirely removed, there is now little protection offered to the human and structural remains in the upper levels of the cemetery. The apparent presence of numerous infant burials in the later phases of cemetery usage is possibly a very significant observation in relation to early medieval burial practices. The poor bone preservation conditions and the closeness of skeletal material to the present ground surface, mean that this potentially important osteological evidence is at risk of loss.

Sufficient data has been recovered from the excavation to inform decisions on the future management of the site, both as an historic monument and as an archaeological resource.

No additional burials under immediate threat of coastal erosion have been identified as a result of the fieldwork. The eroding cists at the western extremity of the site, however, are at immediate risk of loss, and are potentially of great significance to understanding the development of the site as a whole. The cemetery compound is some distance from the cliff edge, and is not under immediate threat from coastal erosion. The rate at which this part of the coast is eroding is unknown.

The importance of the site does not lie in its physical structures alone. From a research perspective, much of the history and nature of the site still remains to be clarified, and there is potential for the recovery of much more significant data.

The skeletal material is of considerable importance to understanding the site, and early medieval communities in the region more generally. The cemetery compound represents a finite area containing a distinct group of burials that would provide an excellent assemblage for the analysis of an early medieval population. Such a potentially complete group of this period, within a defined and relatively small area is rare, and would be an excellent focus for future excavation. The importance of the skeletal remains at West Angle Bay is further enhanced by the potential for comparison with the considerable human bone assemblage recovered from the early medieval cemetery recently excavated at Brownslade Barrow (Hughes *et al.* 2007).

If not under threat of erosion from the cliff edge, the skeletal material within the cemetery compound is still threatened by soil conditions at the site. All the skeletal material recovered from the excavations has been very poorly preserved and will continue to deteriorate, even if left undisturbed.

At the very least, management goals should aim to minimize further disturbance to the site. The current land management does not actively threaten the survival of the archaeological resource, and is secured for the next five years or so under an agri-environment grant scheme.

Were ploughing any deeper than the current plough zone ever occur at the site in the future, it would inflict significant damage to the cemetery compound and its burials. The site is currently not protected as a scheduled Ancient Monument, but

such protection, while protecting the surviving cemetery structures would not prevent loss of the skeletal material.

Management options should therefore consider the value of the archaeological resource and the information that could be recovered through excavation now, over the survival of the structure at the expense of a potentially significant assemblage of early medieval skeletal material lost to further deterioration.

Outreach

The project was also very successful from the point of view of student training, hands-on public involvement and public outreach generally. It is hoped that experience gained in undertaking this excavation will help inform future projects involving joint funding partnerships, public participation and education.

The location of the site on the Pembrokeshire coastal path, the proximity to facilities, its accessibility to visitors from the beach, and its potential to attract visitors to Angle, and its potential to add to local history, archaeological understanding of Angle, Pembrokeshire and the early medieval period all combine to make the site at West Angle Bay an excellent candidate for future outreach and educational programmes.

Archaeological research

Although coastal erosion at West Angle Bay has resulted in loss of an unknown portion of the site, the excavations have demonstrated that sufficient features remain that have considerable potential to provide important new information for the study and understanding of the early medieval period in west Wales.

Although the rural, coastal setting of the site, and its location within the PCNP provide protection from development impact, the excavation has also clarified the extent to which the surviving features and deposits are at risk, not only from coastal erosion, but also from continuing degradation of skeletal material.

The excavation has demonstrated that there is considerable opportunity, potential and justification for further archaeological research to be undertaken at West Angle Bay. The site not only has the potential to shed light on the structural development and chronology of such sites, but also to provide a finite and essentially complete burial population with the potential to provide an assemblage unique to the region and of potentially national importance to research into the early medieval period in Wales. This potential importance of this assemblage is enhanced by the skeletal assemblage recovered from the recent excavations at Brownslade Barrow.

This archaeological potential, combined with the outreach potential offered by the location, and public accessibility of the site, make it an ideal candidate to become the focus of a broader programme of historical research and archaeological excavation at the numerous other early medieval coastal cemetery sites around the Milford Haven, which are also under threat from coastal erosion.

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APPENDICES

APPENDIX 1

THE CHARRED PLANT REMAINS FROM THE EXCAVATIONS AT WEST ANGLE, PEMBROKESHIRE. 2006

Astrid E. Caseldine and Catherine J. Griffiths

During the second season of excavations at West Angle further samples were taken for plant macrofossil analysis to ascertain the nature of former agricultural/domestic activity in the area. An assessment of the potential of the site for plant macrofossil remains had been carried out in association with the first excavation (Caseldine and Griffiths 2006). The samples from the 2006 excavations were from selected contexts and comprised two samples (221, 223) from the ditch surrounding the cemetery and one sample from a grave fill (210) in Trench 13, two samples (209, 229) from the basal fill of the outer ditch in Trench 15, and one sample (222) from one of the ditches of the ditched trackway in Trench 18.

Methods

The samples were processed at the University of Wales, Lampeter by either manual flotation or by flotation machine. In both cases the finest sieve used to collect the flot and the residue was 250µm. The samples were sorted and identified using a Wild M5 microscope. Identification was by reference to standard texts (e.g. Schoch *et al* 1988, Jacomet 2006) and a modern seed collection.

Results

The results are presented in Table 1. The nomenclature and most of the ecological information is based on Stace (1995).

Cereal identification

The majority of the wheat (*Triticum*) grain and chaff was poorly preserved and could not be assigned to an individual species, although some of the chaff could be placed in an emmer/spelt (*T. dicoccum*/*T. spelta*) category. Also, although there is considerable overlap in the grain morphology of different types of wheat, the shape of one grain tentatively suggested emmer wheat (*T. cf. dicoccum*), whilst the shape of two other grains indicated the presence of bread wheat (*T. aestivum*). Hulled barley (*Hordeum* sp.) was present but, although no twisted grains were identified, there was insufficient evidence to be certain whether it was two-row or six-row barley. The absence of well preserved oat (*Avena* sp.) chaff meant that it could not be determined whether the oat was wild or cultivated.

Discussion

Enclosure Ditch 230

Comparatively little was recovered from the basal fill of the outer enclosure ditch (230), only one indeterminate cereal grain from context 229 but slightly more from context 209. The remains from the latter included emmer/spelt glume bases, oat awns and a few weed seeds and suggested crop processing waste. The weed seeds included stinking chamomile (*Anthemis cotula*), a weed typical of arable land and waste ground, and heath grass (*Danthonia decumbens*), which is commonly found on heaths on sandy or peaty soils. However, it has been suggested that heath grass was an arable weed as it has been found to be strongly associated with assemblages containing spelt chaff (Hillman 1981, Van der Veen 1992). Its eradication from arable fields today has been interpreted as a

change in ploughing practice from ard ploughing to mouldboard ploughing (Hillman 1981, 1982). The presence of stinking chamomile might indicate the cultivation of heavier soils in the area. Ribwort plantain (*Plantago lanceolata*) was also present in the sample and this is found in a wide range of grassy habitats, as well as open, cultivated land. Other remains included a few rhizome fragments and a bone. The remains could represent waste dumped directly in the ditch from a domestic fire or midden waste that had been spread on the land as manure and had then fallen into the ditch. However, there were no mineralised remains which would have provided stronger evidence of midden waste.

Cemetery Ditch 238

Only a small amount of charred material was found in the sample from the lower fill (223) of the cemetery ditch (238) but, as with enclosure ditch 230, there was some evidence for emmer/spelt wheat, a spikelet fork, and for oat, a floret base. Unfortunately the latter was too poorly preserved to determine whether it was from cultivated or wild oat. However, as well as wheat and oat, there was also evidence of barley being cultivated. Dock (*Rumex* sp.) and grass (Poaceae) seeds may indicate grassland/cultivated land and a gorse (*Ulex* sp.) spine suggests scrub growing in the area. Again the remains may represent waste from a fire that had been deliberately deposited in the ditch or remains that had been blown or washed into it.

The sample from the upper fill (221) produced greater quantities of oat and barley grains and bread wheat was also present. Although no floret bases were recovered in this sample, a possible bristle oat (cf. *Avena strigosa*) floret base and a bristle/common oat (*A. strigosa/A. sativa*) type floret base were recovered in the assessment sample from the ditch (Caseldine and Griffiths 2006). It is therefore probable that the oat represents a crop rather than a weed. The oat grains were generally quite small which might suggest bristle oat rather than common oat (*A. sativa*), but the grain could represent the secondary and tertiary florets of common oats or wild oats (*A. fatua*, *A. sterilis* = *A. ludoviciana*). Bristle or small oat has been widely cultivated in Wales, particularly in areas where conditions are unsuitable for common oat, where it is known as 'Ceirch Llwyd' (sand oat) or 'Blewgeirch' (black oat) (Hubbard 1968). It is also possible it could have been grown with barley as a mixed crop (drage), rather than as a single crop. Mixed crops were frequently sown in case of failure of one of the crops. Alternatively, the oat might have been a weed of the barley crop and deliberately allowed to grow in the fields and harvested with the barley. The cereal might have been used as fodder, for human consumption as bread or oatcakes, or for brewing. Barley is more salt-tolerant than other cereals and might have been a more reliable crop than bread wheat in this coastal area.

Other weed seeds of cultivation or grassland were scarce in the assemblage but included brome (*Bromus* sp.), goosefoot (Chenopodiaceae), and legumes such as medick (*Medicago*) type and hairy/smooth tare (*Vicia hirsute/V. tetrasperma*). The distinctive corm-like swollen basal internode of onion couch grass (*Arrhenatherum elatius* var. *bulbosum*) was also present. As well as growing in a wide range of habitats including grassland, rough ground and maritime sand and shingle, onion couch grass is also found in arable land where the swollen internodes are an effective means of propagation (Hubbard 1968). However, *Arrhenatherum* grassland can be associated with the *Prunus spinosa*-*Rubus fruticosus* vegetation community (Rodwell 1991), which can occur in hedges as well as scrub, and blackthorn (*Prunus spinosa*) charcoal was recovered from this sample (see charcoal report below). Wood charcoal was quite frequent in the sample and the remains suggest the deliberate dumping of waste from a domestic fire in the ditch.

Grave 211

The assemblage from grave fill 210 was also relatively rich in remains and similarly contained wheat, barley and oat but grain was relatively scarce, as were weed seeds. Of the wheat, there was some slight evidence for the presence of glume wheats, a glume base, and a possible emmer grain. However, most of the remains in the assemblage consisted of a range of material from woody plants, including gorse spines, a thorn of blackthorn, as well as other thorns, a bramble (*Rubus* sp.) seed and some hazelnut (*Corylus avellana*) shell fragments, all of which indicate the presence of scrub woodland or possibly hedges in the area. Wood charcoal was also relatively frequent in the sample and the bramble and hazelnut could have been collected along with the wood for a fire, although no hazel charcoal was recorded from this sample (see charcoal report). It is also possible that brambles and hazelnuts were being gathered as foodstuffs. This could indicate a continuation of the practice, dating from prehistoric times, of the utilisation of wild resources for food. Small fragments of bone in this sample were probably derived from the grave rather than associated with the charred remains.

Several of the weed seeds may also indicate woodland. The presence of wood sage (*Teucrium scorodonia*) may provide evidence both for woodland and the coastal location as it grows in woods and hedgerows and also on fixed shingle and sand dunes. Equally, while corn/water mint (*Mentha arvensis/M. aquatica*) may indicate cultivation, corn mint can be found in woodland clearings and certain species of violet (*Viola* sp.) also occur in woodland. Indeed the presence of wood sage, violet, bramble, gorse, hazel, bracken and blackthorn may suggest a scrub community similar to the *Prunus spinosa-Rubus fruticosus* scrub community (Rodwell 1991), although it is likely that other scrub communities were also present.

Ditched trackway

The remaining sample was from the fill (222) of one of the parallel ditches (235) interpreted as a ditched trackway. This sample yielded only a few remains, mainly cereal. Again there was some evidence for wheat, including glume wheats, as well as barley and oat being grown. The cornfield weed, corn marigold (*Chrysanthemum segetum*) was also present. The remains could represent waste which had been used as manure on the fields.

Crop husbandry during the early medieval period

Throughout the period of agricultural activity investigated at the site the frequency of plant remains suggests a relatively low level of cereal cultivation, but this may be a reflection of the contexts examined and an underestimate of activity. Although the evidence from the outer ditch is slight, comparison with the evidence from the other samples may indicate a change in crop husbandry in the area over time. Charcoal from context 209 in the outer ditch gave a date of Cal AD 540 to 650, while charred remains from context 223 from the cemetery ditch gave a date of Cal AD 660 to 870 and bone from grave 210 gave a date of Cal AD 900 to 920 and Cal AD 950 to 1040. The assemblage from 209 differs from that from the other samples by the absence of barley, frequency of glume wheat chaff, and limited evidence for oat. There is also evidence from the upper fill 221 of the cemetery ditch for bread wheat. This possibly suggests a change in the principal crops from glume wheats to bread wheat, barley and oat. Hints of this change have been recorded at the end of the Roman period at other sites in West Wales, for example Llawhaden (Caseldine and Holden 1998) and Great Castle Head, Dale (Caseldine 2002). However, it appears that glume wheats, emmer/spelt, may have continued to be grown in the West Angle area, although they could have been 'weed' contaminants. Alternatively, it is possible that the glume wheat evidence is residual and relates to an earlier, prehistoric phase at the site. Plant remains associated with Iron Age cultivation marks buried beneath sand deposits at the early medieval cemetery at Brownslade also included emmer/spelt, spelt,

barley and oats, whilst evidence from a later (?post-medieval) shell midden suggested the cultivation of barley and oats, perhaps as drage (Carruthers 2007).

The evidence from West Angle is consistent with that from other early medieval sites in Wales including Newton (Caseldine and Griffiths 2004), Pembrokeshire, where oats, barley and bread wheat were recorded, and Llanelen (Schlesinger and Walls 1995, Kissock 1996) in northern Gower and Capel Maelog (Britnell 1990) in mid Wales where oats and barley were recovered. Similar results have also been found at sites on Anglesey where there was evidence for the cultivation of barley, oat and bread wheat as well as evidence for the continued cultivation of emmer and spelt during this period (Williams 1986, Smith 1987, Ciaraldi forthcoming)

Finally, although of later date, there is evidence in the Black Book of St David's, dating to 1326, of the growing of drage and both great and small oats, presumably common and bristle oat, on the St David's estates in Pembrokeshire (Jack 1988), indicating these crop husbandry practices continued during the medieval period

Conclusions

The charred plant remains provide evidence of domestic/agricultural activity in the area of the cemetery at West Angle. The crops grown were wheat, hulled barley and oats. There is possible evidence for a change in the main crops being grown over time. Some cultivation may have occurred on heavier soils. The results are similar to those from other early medieval sites in Wales. Other plant remains indicate the presence of scrub woodland/hedges in the area.

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Table 1 Charred plant remains from West Angle.

Trench	13	13	13	15	15	18	Ecology
Feature	Grave 211	Ditch 238	Ditch 238	Ditch 230	Ditch 230	Ditch 235	
Context	210	221	223	209	229	222	
Volume (Litres)	27	37	10	21	9	8	
Cereal remains							
<i>Triticum</i> cf. <i>dicoccum</i> grain (Emmer wheat)	1	-	-	-	-	-	
<i>Triticum</i> <i>dicoccum</i> / <i>T. spelta</i> glume bases (Emmer/spelt wheat)	-	-	-	4	-	-	
<i>Triticum</i> <i>dicoccum</i> / <i>T. spelta</i> spikelet forks	-	-	1	-	-	-	
<i>Triticum aestivum</i> grain (Bread wheat)	-	2	-	-	-	-	
<i>Triticum</i> sp. grain (Wheat)	5	3	2	-	-	1	
<i>Triticum</i> sp. glume bases	1	-	-	1	-	1	
<i>Triticum</i> sp. rachis	-	-	-	7	-	2	
<i>Hordeum</i> sp. (Hulled) grain - straight (Barley)	1	8	-	-	-	-	
<i>Hordeum</i> sp. (Hulled) grain – indet.	-	3	-	-	-	-	
<i>Hordeum</i> sp.	2	3	1	-	-	2	
<i>Hordeum</i> sp. rachis	-	-	1	-	-	-	
<i>Avena</i> sp. grain (Oat)	4	20	-	-	-	4	
<i>Avena</i> /Poaceae grain (Oat/grass)	1	14	-	-	-	-	C, G
<i>Avena</i> sp. floret bases	-	-	1	-	-	-	
<i>Avena</i> sp. awn frags.	3	2	-	2	-	1	
Cereal indet.	14	14	2	-	1	-	
Other remains							
<i>Corylus avellana</i> L (Hazel) nut frags.	3	-	-	-	-	-	H, S, W
Chenopodiaceae (Goosefoot family)	-	1	-	-	-	-	C, D, n
<i>Rumex</i> sp. (Docks)	-	2	1	-	-	-	C, D, G
<i>Viola</i> sp. (Violet)	1	-	-	-	-	-	C, D, Du, F, G

							,H, He, S, W
<i>Rubus</i> sp. (Brambles)	1	-	-	-	-	-	D, Du, G, H, He, S, W
<i>Prunus spinosa</i> L. (Blackthorn) - thorns	1	-	-	-	-	-	H, S, W
Rosaceae – thorns (Rose family)	8	-	-	-	-	-	H, S, W
<i>Vicia hirsuta</i> (L.) Gray / <i>V.</i> <i>tetrasperma</i> (L.) Schreber (Hairy tare/smooth tare)	-	1	-	-	-	-	D, G
cf. <i>Vicia</i> sp. (Vetches)	1	-	-	-	-	-	
<i>Medicago</i> type (Medicks)	-	1	-	-	-	-	D, G
<i>Ulex europaeus</i> L. spines (Gorse)	14	-	1	-	-	-	G, He, S
<i>Teucrium scorodonia</i> L. (Wood sage)	1	-	-	-	-	-	Du, H, W
<i>Mentha arvensis</i> / <i>M.</i> <i>aquatica</i> L. (Corn/water mint)	1	-	-	-	-	-	C, Gw, P, Wo,
<i>Plantago lanceolata</i> L. (Ribwort plantain)	-	-	-	1	-	-	G, o
<i>Anthemis cotula</i> L. (Stinking chamomile)	1	-	-	1	-	-	C, D
cf. <i>Anthemis cotula</i> L.	-	-	-	4	-	-	
<i>Chrysanthemum segetum</i> L. (Corn marigold)	-	-	-	-	-	1	C, D
Asteraceae (Daisy family)	-	1	-	-	-	-	C, D, Du, F, G, H, S, Wo
Asteraceae/Apiaceae	-	-	-	1	-	-	
<i>Arrhenatherum elatius</i> var. <i>bulbosum</i> (Willd.) (Onion couch grass) rhizome	-	1	-	-	-	-	C, D, G, H
<i>Bromus</i> sp. (Bromes)	-	1	-	-	-	-	C, D, G
<i>Danthonia decumbens</i> (L.) DC. (Heath grass)	-	-	-	1	-	-	C, D, G, He
Poaceae	1	1	1	-	-	-	C, D, G

(Grass family)							
Poaceae culm nodes	-	-	-	1	-	-	
<i>Pteridium aquilinum</i> (L.) Kuhn (Bracken) leaf frags.	1	-	-	-	-	-	He, G, W
cf. fruit frags.	-	-	-	-	-	1	
Seeds indet.	14	3	1	-	-	-	
Thorns indet.	2	2	-	-	-	-	
Flowerheads indet.	1	1	-	-	-	-	
Monocot. rhizome/stem frags.	9	3	-	3	-	4	
cf. Capsule frags.	-	-	-	-	-	1	
cf. Tree bud	-	1	-	-	-	-	
Total no. of items	92	88	12	26	1	18	
Bone frags.	13	-	-	1	-	-	

Ecology: C = cultivated; D = disturbed; Du = dunes; F = fens, marshes etc.; G = grassland; H = hedges; He = heath, moors etc; P = ponds, ditches etc.; S = scrub; W = woods; n = nutrient-rich; o = open ground; w = wet/ damp

CHARCOAL IDENTIFICATIONS FROM WEST ANGLE BAY 2006

Astrid E. Caseldine and Catherine J. Griffiths

A small amount of charcoal was identified from the site, mainly from the fill (210) of grave 211 and the upper fill (221) of the cemetery ditch (238). A few fragments were also identified from the lower fill 223 of the cemetery ditch of which one piece was sent for radiocarbon dating. In addition a single piece of charcoal was identified from the basal fill 209 of enclosure ditch 210 and also sent for radiocarbon dating.

Methods

The charcoal was fractured to produce clean transverse, transverse longitudinal and radial longitudinal sections. A Leica DMR microscope with an incident light source was used to identify the charcoal. Identification was by reference to identification atlases (Schweingruber 1978, Schoch *et al* 2004) and modern reference material. Nomenclature follows Stace (1995). The results are given in Table 1.

Discussion

The only fragment of charcoal from the outer ditch was of blackthorn (*Prunus spinosa*). This was also found in the cemetery ditch samples. Other woodland species represented included wild cherry (*Prunus* spp.), hazel (*Corylus avellana*), birch (*Betula* spp.), oak (*Quercus* spp.) and ivy (*Hedera helix*). Oak, hazel, birch and blackthorn were also identified in samples from the 2005 excavations (Caseldine and Griffiths 2006).

The charcoal evidence suggests the presence of oak woodland and is in agreement with the plant macrofossil evidence for the presence of scrub woodland, possibly similar to that of the *Prunus spinosa*-*Rubus fruticosus* scrub community (Rodwell 1991), in the area. Ivy frequently forms a ground carpet or patchy cover in scrub woodland as well as being found in oak woodland. Although the trees and shrubs may have been growing in separate stands of scrub or

woodland, it is equally possible they may have been growing in hedges, perhaps associated with the bank and ditch of the cemetery.

Table 1 Charcoal identifications from West Angle

Trench	13	13	13	15	Total
Feature	Grave 211	Ditch 238	Ditch 238	Ditch 230	
Context	210	221	223	209	
<i>Betula</i> spp. (Birch)	1	-	-	-	1
<i>Corylus avellana</i> L. (Hazel)	-	-	3	-	3
<i>Quercus</i> spp. (Oak)	13	11	1	-	25
<i>Prunus spinosa</i> L. (Blackthorn)	-	1	2	1	4
<i>Prunus</i> spp. (Cherries)	1	2	-	-	3
<i>Hedera helix</i> L. (Ivy)	-	1	-	-	1
Total	15	15	6	1	36

Bibliography

- Caseldine, A.E. and Griffiths, C.G. 2006 *The Charred Plant Remains from the Cemeteries Excavations at West Angle, Pembrokeshire*. Unpublished report prepared for Cambria Archaeology.
- Rodwell, J.S. 1991 *British Plant Communities. Volume 1 Woodlands and Scrub*. Cambridge, Cambridge University Press.
- Schoch, W., Heller, I., Schweingruber, F.H., Kienast, F. 2004 *Wood Anatomy of Central European Species*. Online version: www.woodanatomy.ch
- Schweingruber F.H. 1978 *Microscopic Wood Anatomy*.
- Stace, C. 1995 *New Flora of the British Isles*. Cambridge, Cambridge University Press.

APPENDIX 2

CARBON 14 DATING CALIBRATION GRAPHS

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.2:lab.mult=1)

Laboratory number: **Beta-229574**

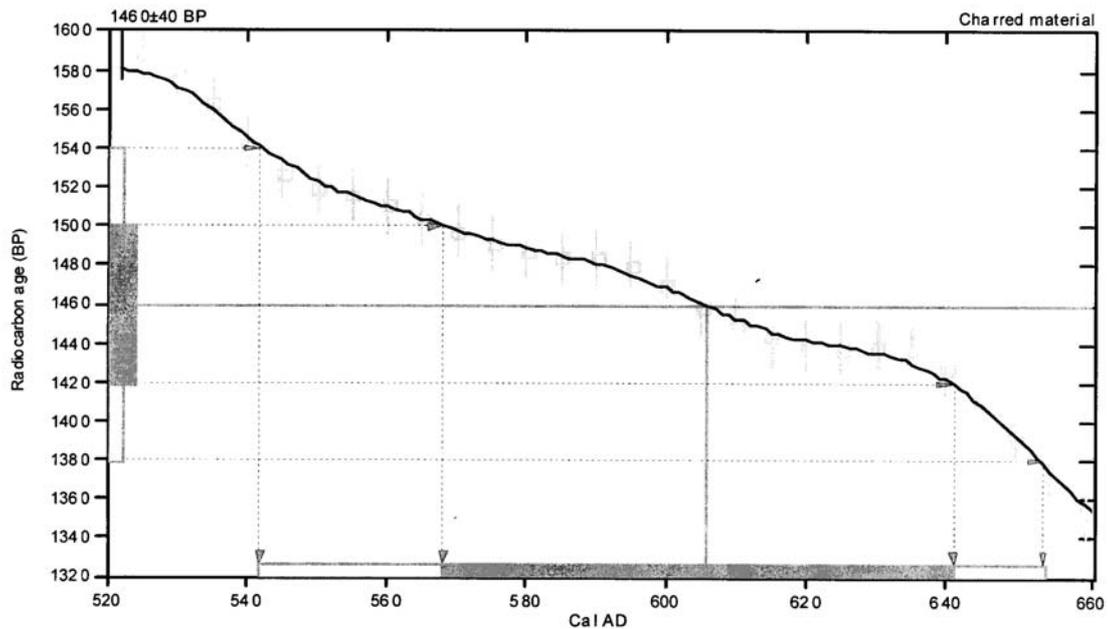
Conventional radiocarbon age: **1460±40 BP**

2 Sigma calibrated result: **Cal AD 540 to 650 (Cal BP 1410 to 1300)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: **Cal AD 610 (Cal BP 1340)**

1 Sigma calibrated result: **Cal AD 570 to 640 (Cal BP 1380 to 1310)**
(68% probability)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35 (2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21:lab. mult=1)

Laboratory number: **Beta-229575**

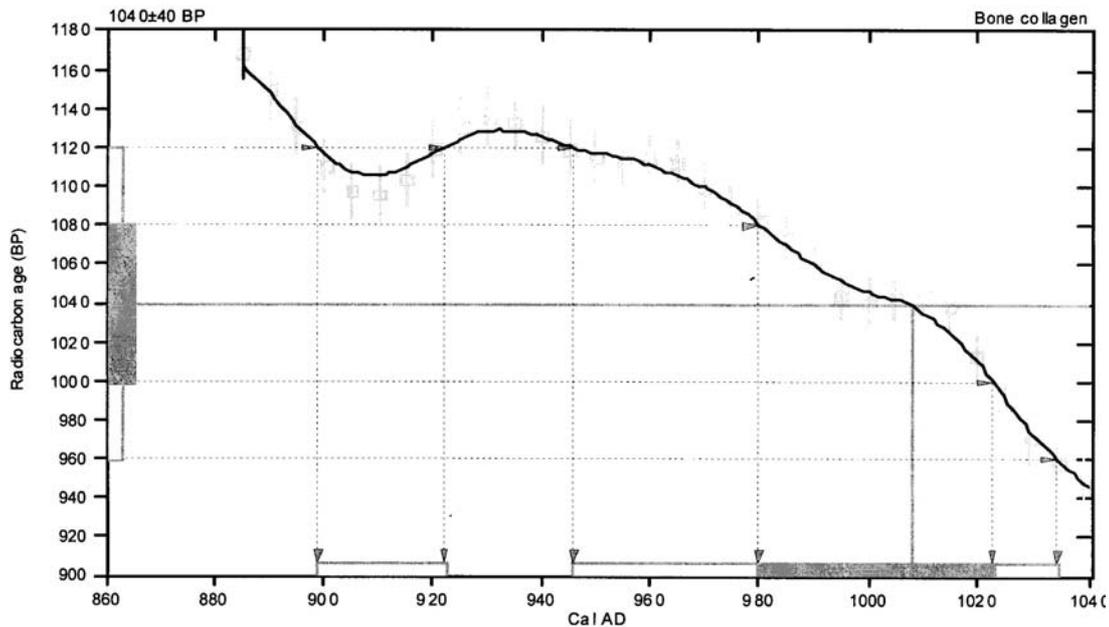
Conventional radiocarbon age: **1040±40 BP**

**2 Sigma calibrated results: Cal AD 900 to 920 (Cal BP 1050 to 1030) and
(95% probability) Cal AD 950 to 1040 (Cal BP 1000 to 920)**

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 1010 (Cal BP 940)

1 Sigma calibrated result: Cal AD 980 to 1020 (Cal BP 970 to 930)
(68% probability)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35 (2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22:lab. mult=1)

Laboratory number: **Beta-229576**

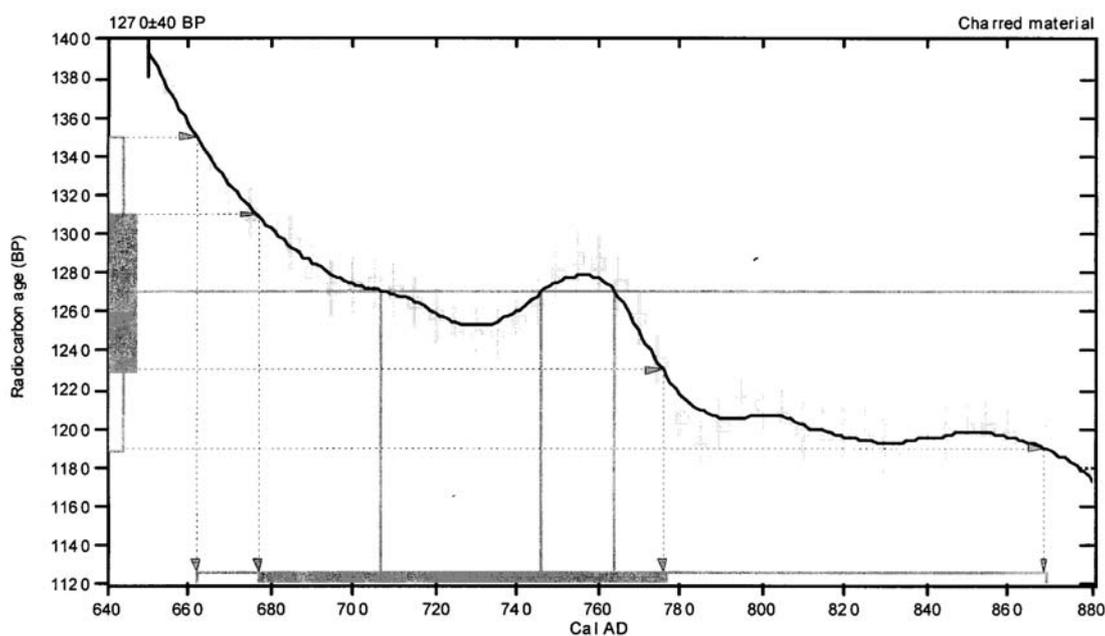
Conventional radiocarbon age: **1270±40 BP**

2 Sigma calibrated result: Cal AD 660 to 870 (Cal BP 1290 to 1080)
(95% probability)

Intercept data

Intercepts of radiocarbon age
with calibration curve: Cal AD 710 (Cal BP 1240) and
Cal AD 750 (Cal BP 1200) and
Cal AD 760 (Cal BP 1190)

1 Sigma calibrated result: Cal AD 680 to 780 (Cal BP 1270 to 1170)
(68% probability)



References:

- Database used*
INTCAL04
Calibration Database
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).
- Mathematics*
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35 (2), p317-322

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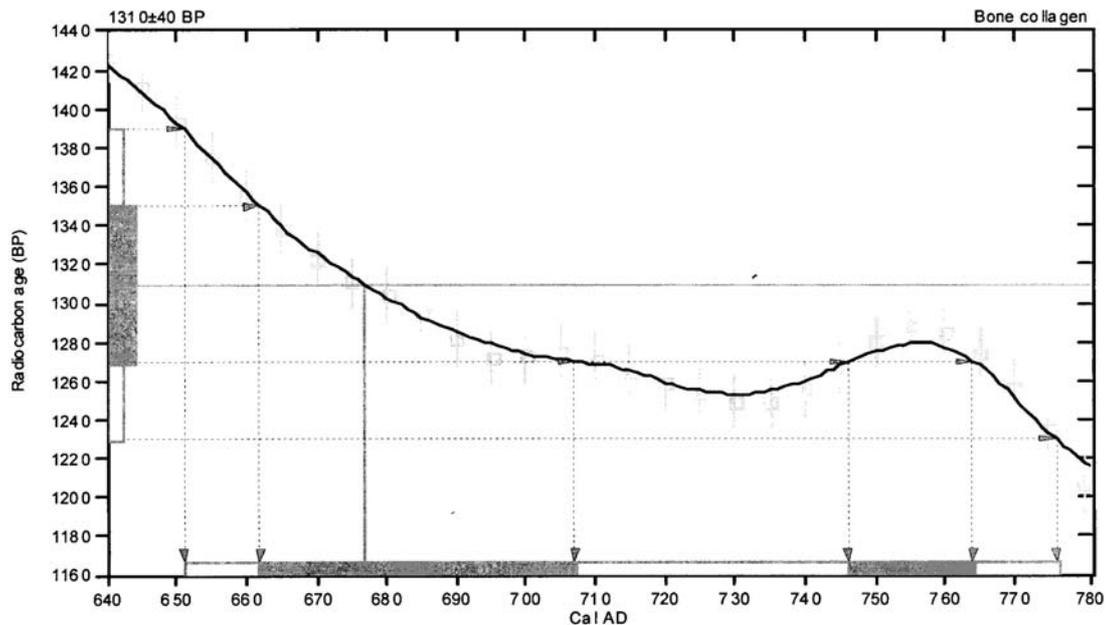
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21.2;lab.mult=1)

Laboratory number: **Beta-229577**
Conventional radiocarbon age: **1310±40 BP**
2 Sigma calibrated result: **Cal AD 650 to 780 (Cal BP 1300 to 1170)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: **Cal AD 680 (Cal BP 1270)**
1 Sigma calibrated results: **Cal AD 660 to 710 (Cal BP 1290 to 1240) and**
Cal AD 750 to 760 (Cal BP 1200 to 1190)



References:

- Database used*
INTCAL04
- Calibration Database*
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).
- Mathematics*
A Simplified Approach to Calibrating C14 Dates
Tallm, A. S., Vogel, J. C., 1993, Radiocarbon 35 (2), p31 7-3 22

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-20.4;lab. mult=1)

Laboratory number: Beta-208267

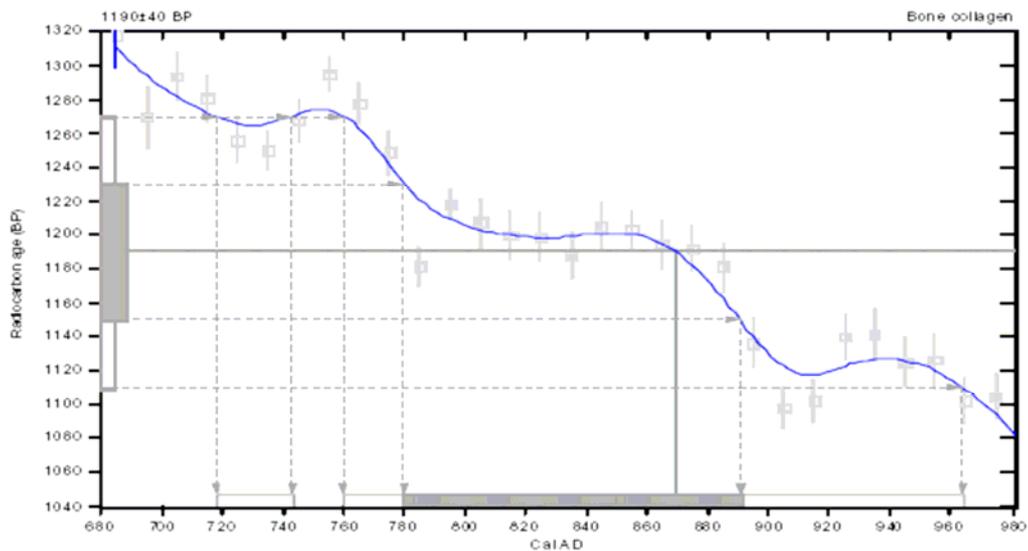
Conventional radiocarbon age: 1190±40 BP

2 Sigma calibrated results: Cal AD 720 to 740 (Cal BP 1230 to 1210) and
Cal AD 760 to 960 (Cal BP 1190 to 990)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 870 (Cal BP 1080)

1 Sigma calibrated result: Cal AD 780 to 890 (Cal BP 1170 to 1060)



References:

- Database used*
INTCAL 98
- Calibration Database*
Editorial Comment
- Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-xiii
- INTCAL 98 Radiocarbon Age Calibration
- Stuiver, M., et al., 1998, *Radiocarbon* 40(3), p1041-1083
- Mathematics*
A Simplified Approach to Calibrating C14 Dates
- Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-14.3;lab. mult=1)

Laboratory number: **Beta-208268**

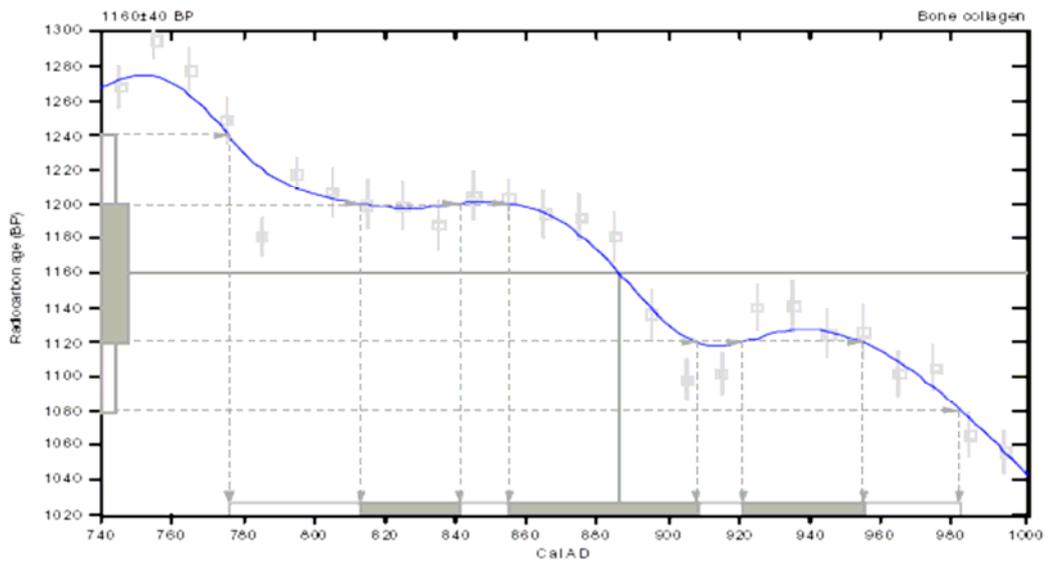
Conventional radiocarbon age: **1160±40 BP**

2 Sigma calibrated result: **Cal AD 780 to 980 (Cal BP 1170 to 970)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: **Cal AD 890 (Cal BP 1060)**

1 Sigma calibrated results: **Cal AD 810 to 840 (Cal BP 1140 to 1110) and**
Cal AD 860 to 910 (Cal BP 1100 to 1040) and
Cal AD 920 to 960 (Cal BP 1030 to 1000)



Reference:

Database used

INTCAL 98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xxii

INTCAL 98 Radiocarbon Age Calibration

Stuiver, M., et al., 1998, Radiocarbon 40(3), p1041-1083

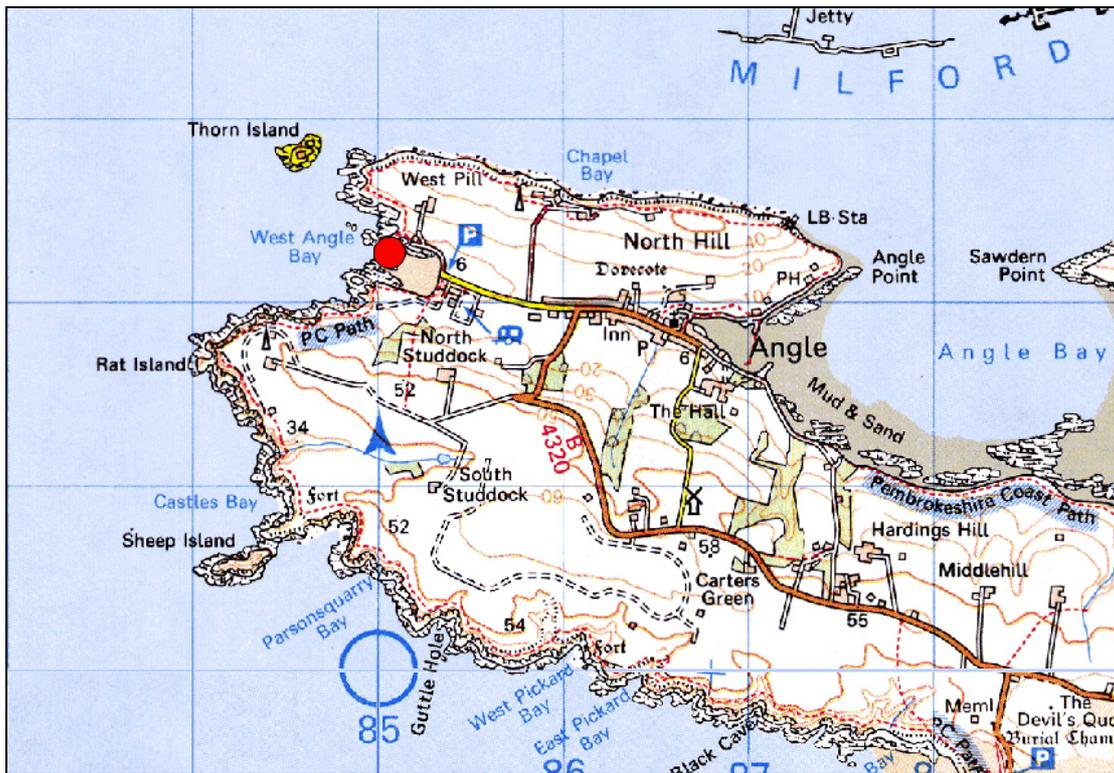
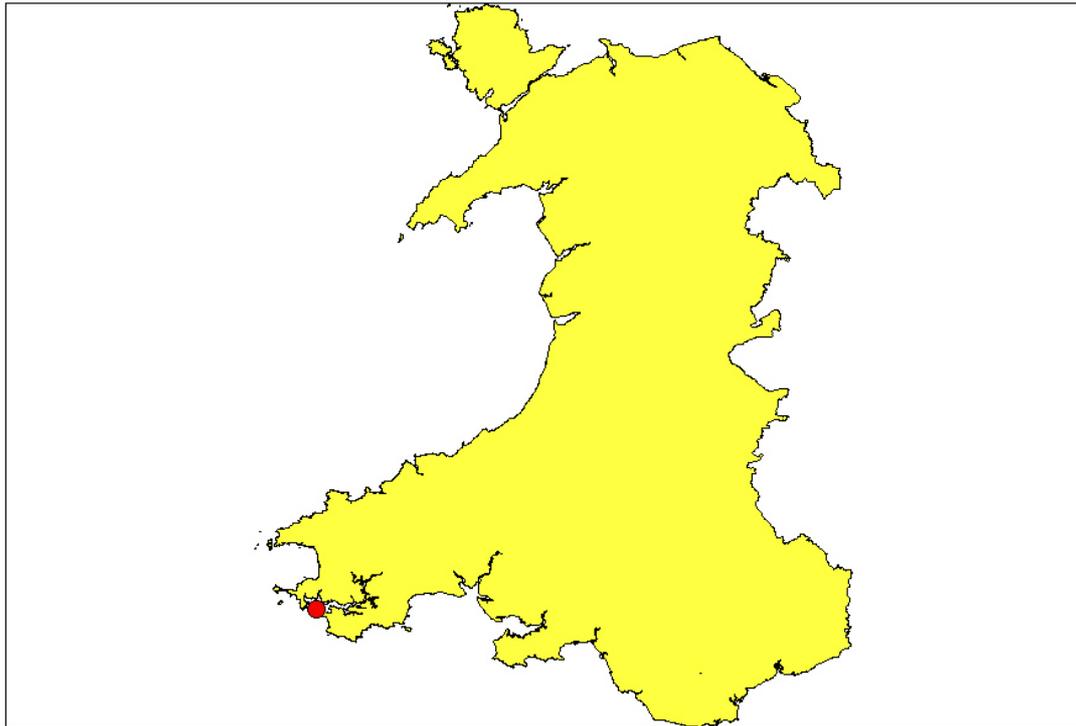
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Reproduced from the 1995 Ordnance Survey 1:50,000 scale Landranger Map with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright Cambria Archaeology, Licence No AL51842A

Figure 1. Site location map, based on the Ordnance Survey.

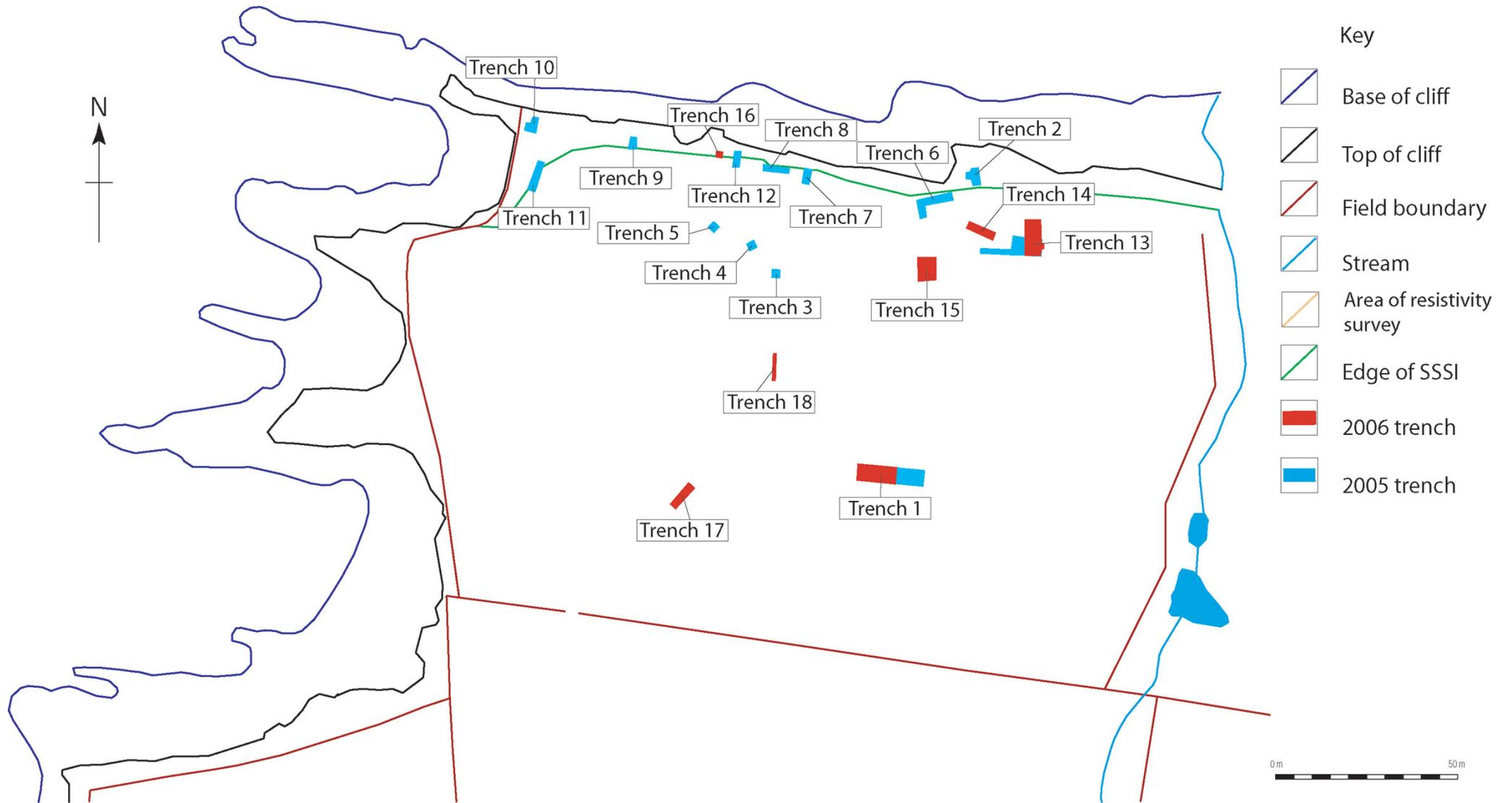


Figure 2: Trench location plan

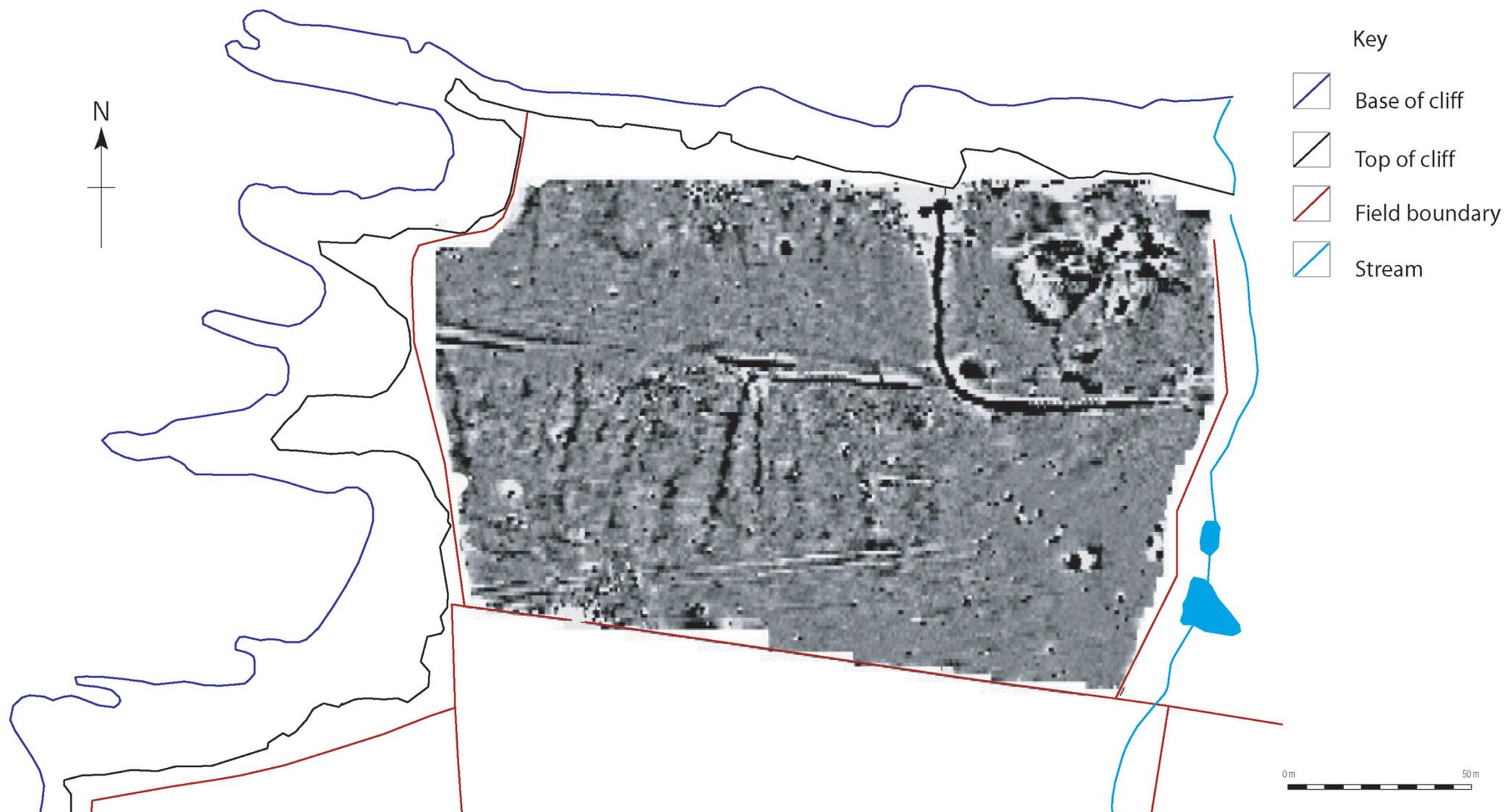


Figure 3: Geophysics gradiometer survey raw data

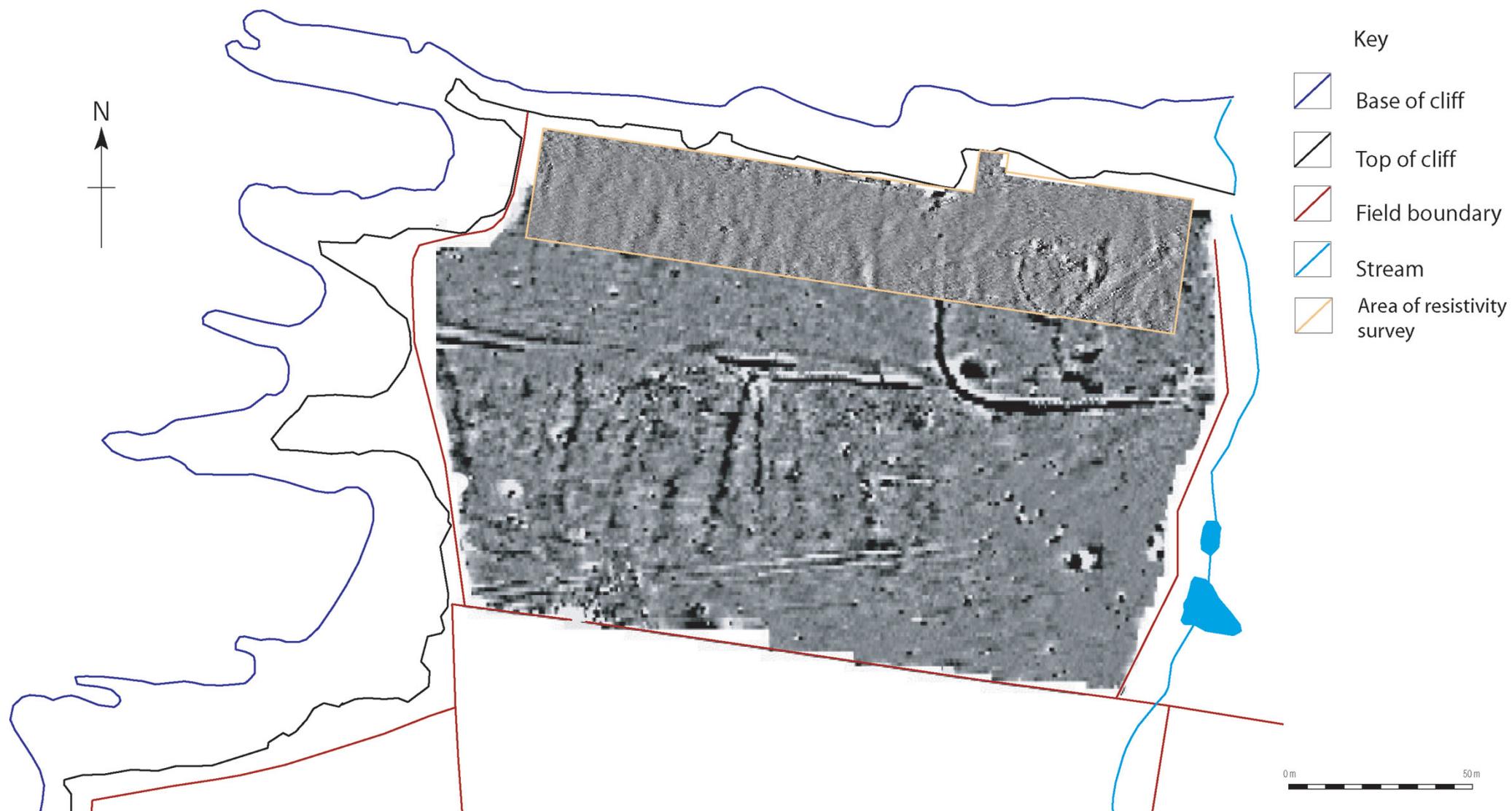


Figure 4: Geophysics survey gradiometer survey with resistivity survey overlay on northern edge.



Figure 5: Trench location plan in relation to interpretation of geophysics survey

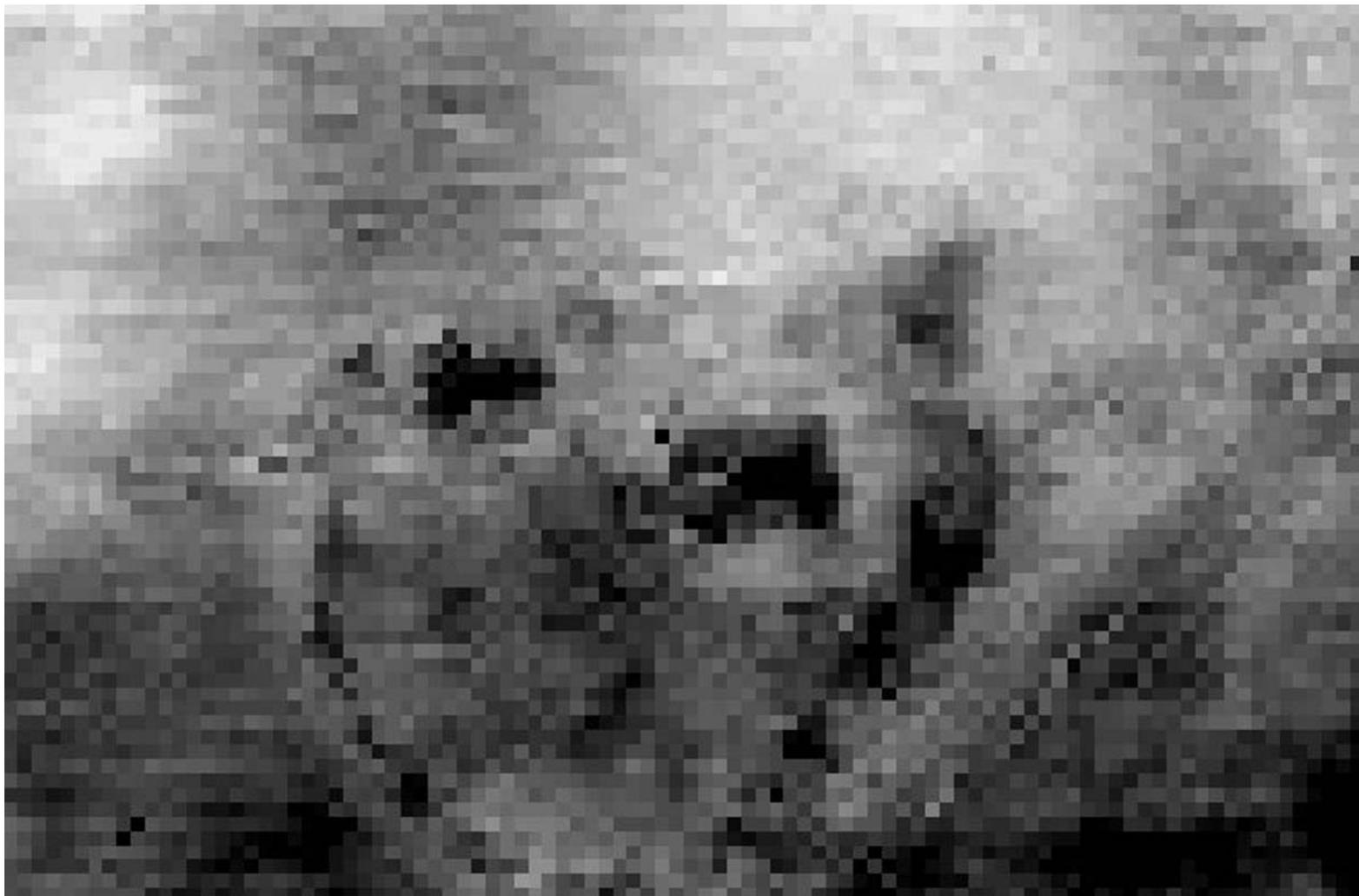


Figure 6: Detail of Resistivity survey showing possible rectangular building within the funerary compound.

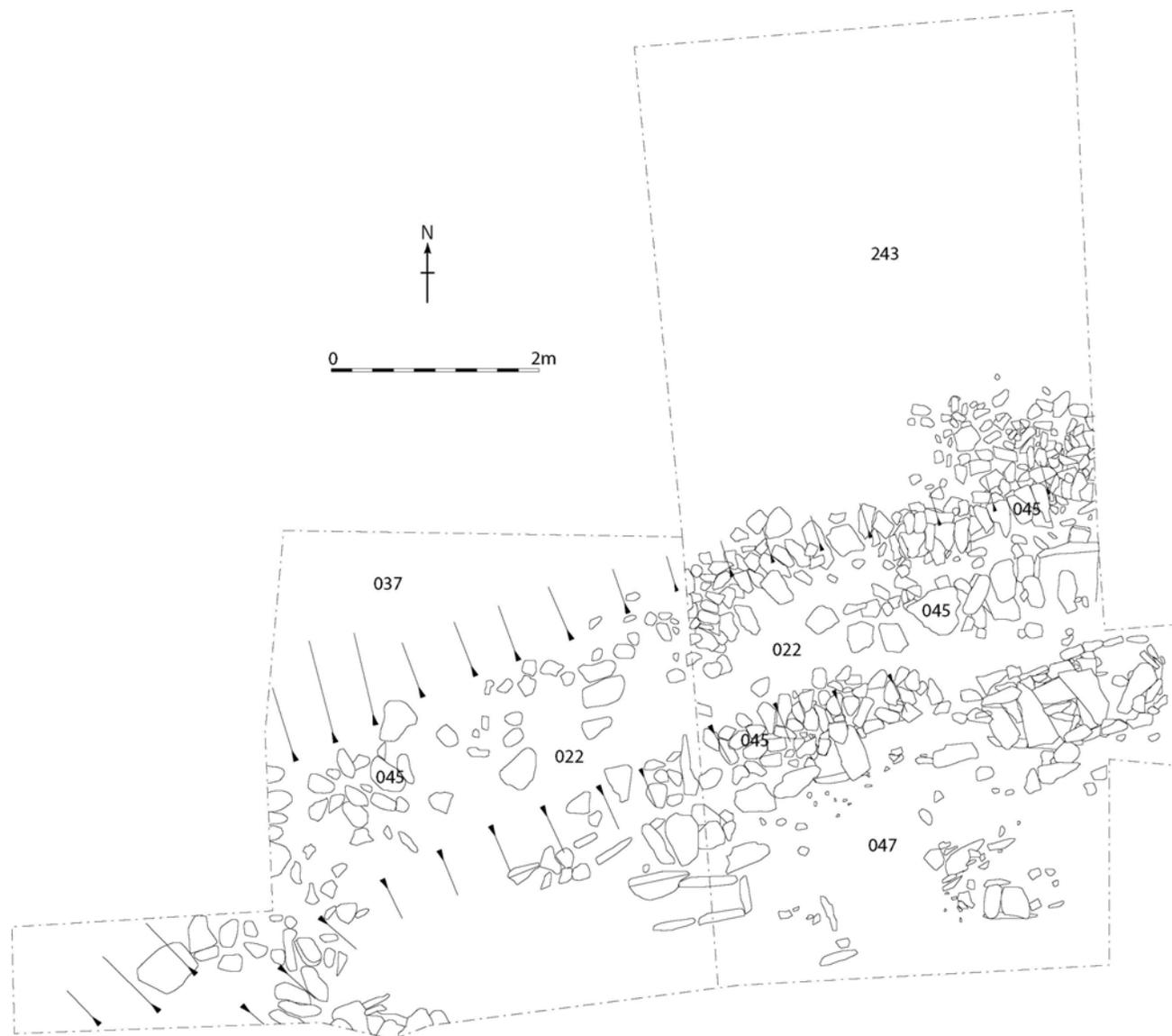


Figure 7: Trench 13 plan 'pre-excavation'

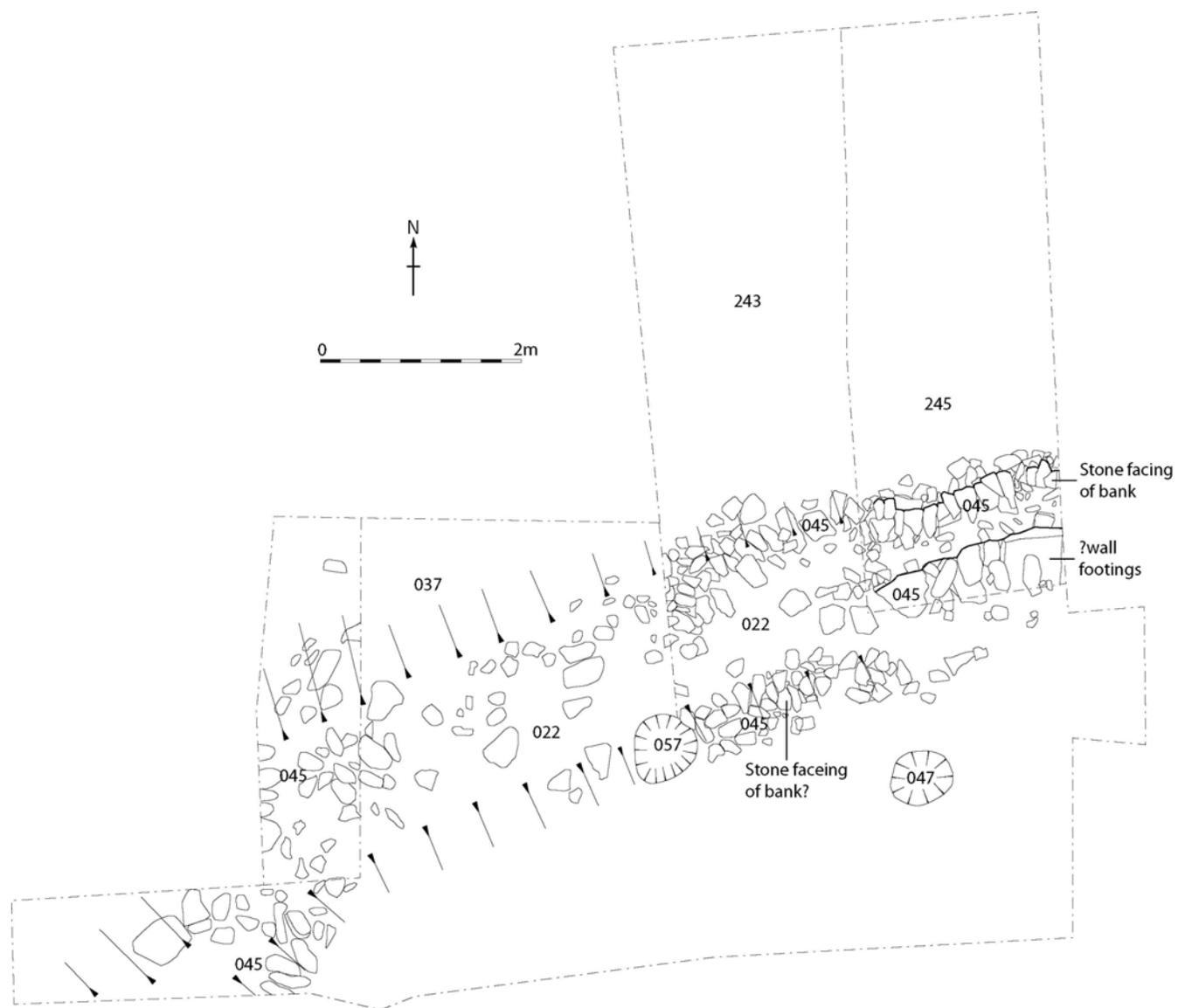


Figure 8: Trench 13 showing bank/wall remnants and later cut features (excluding burials)

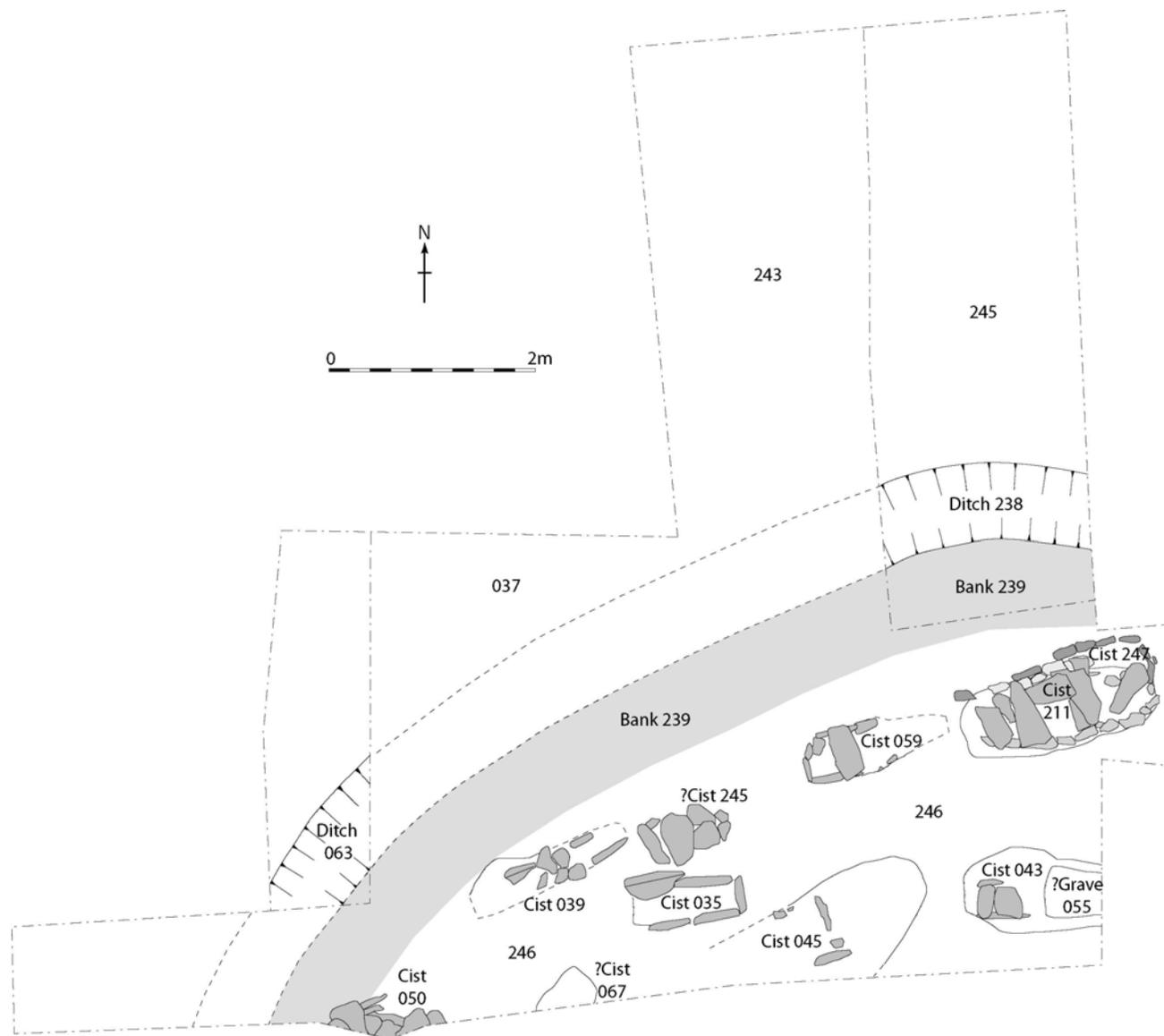


Figure 9: Trench 13 showing boundary ditch and ?bank and cist structures with cap stones

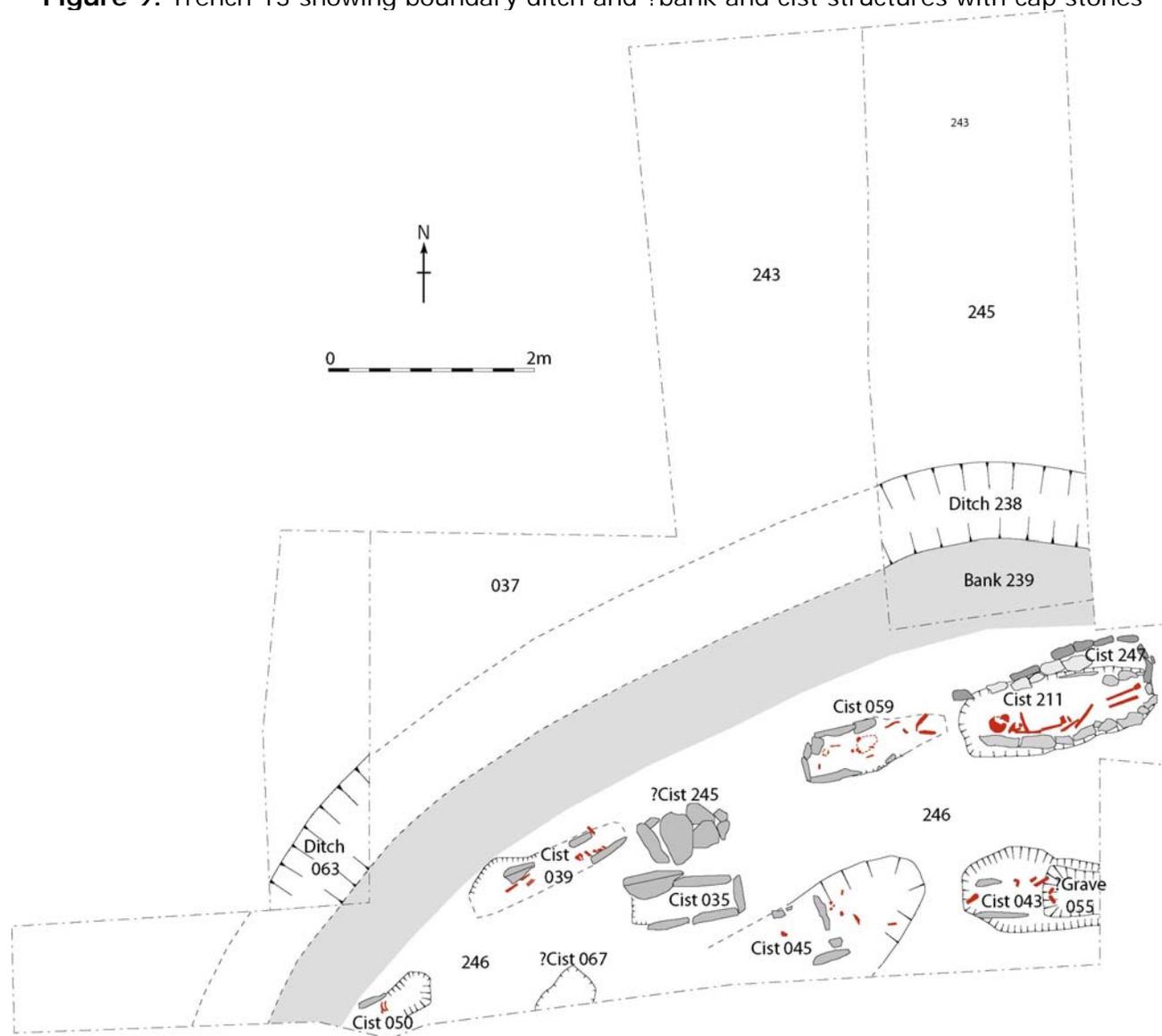


Figure 10: Plan of Trench 13 showing excavated burials with skeletal material

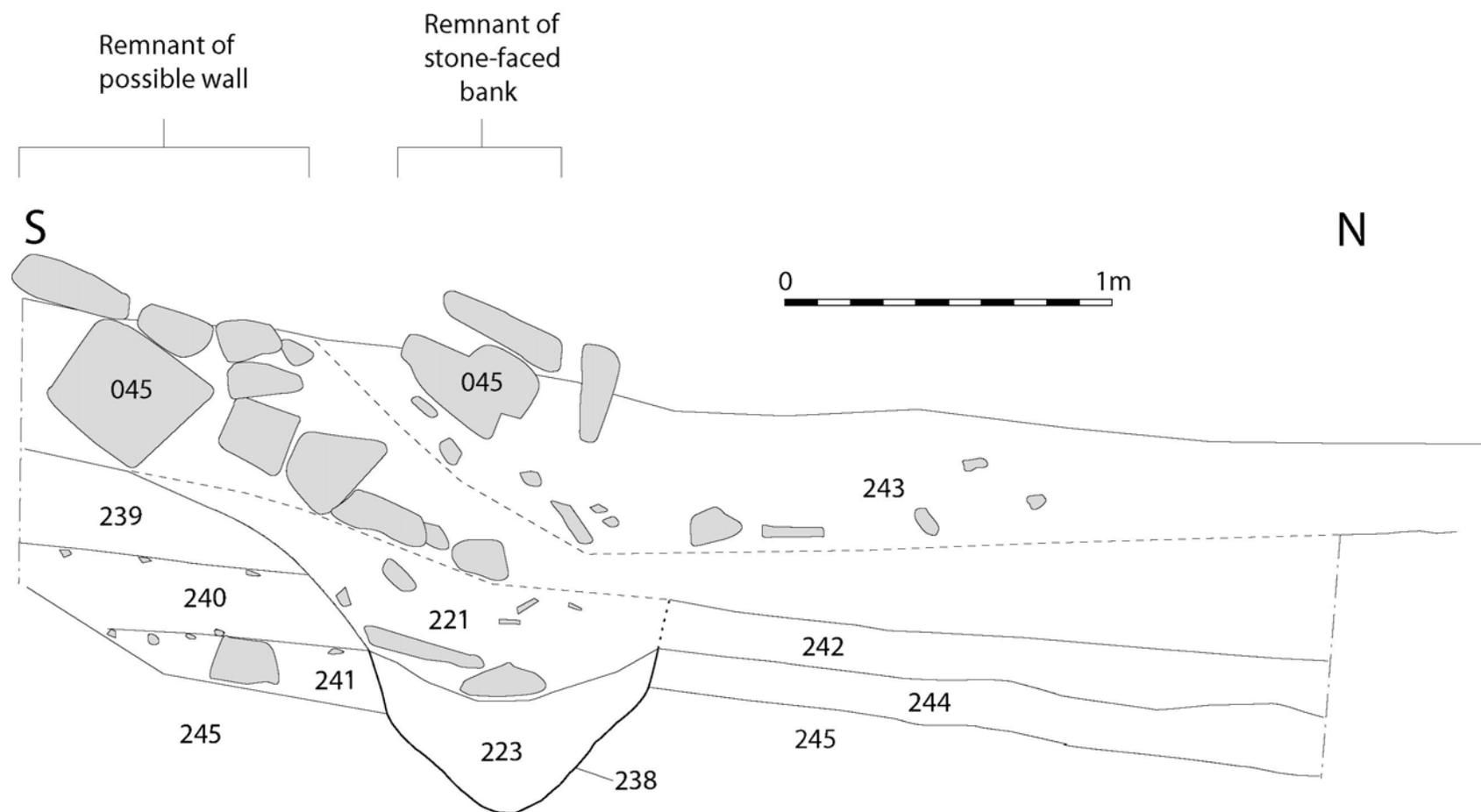


Figure 11: Section through ditch and bank in Trench 13

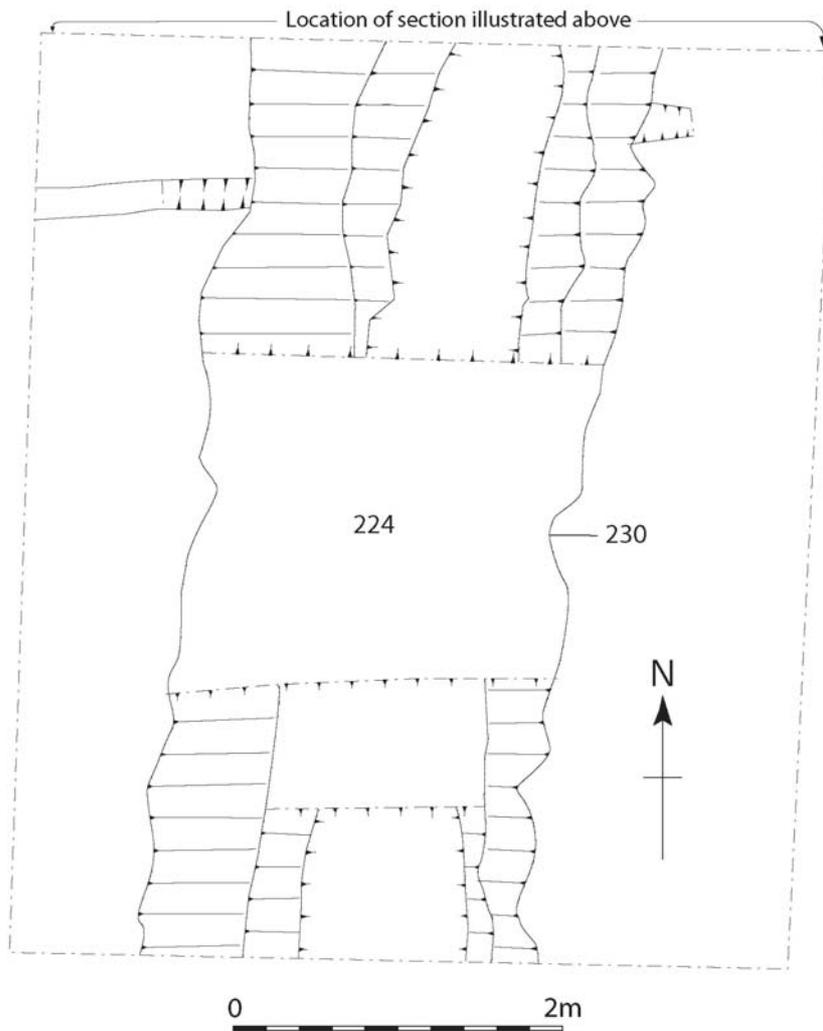
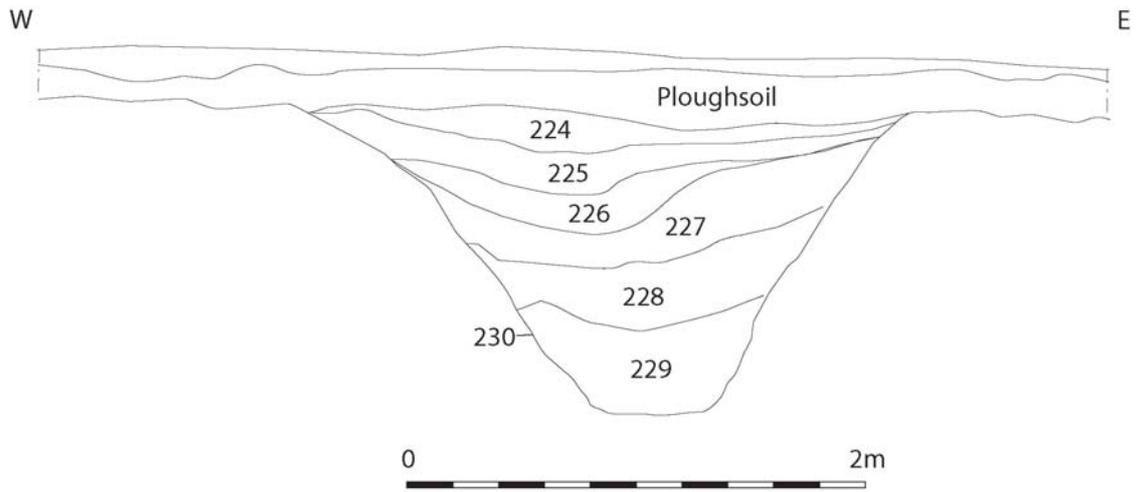


Figure 12: Trench 15. Ditch 230 in plan and section

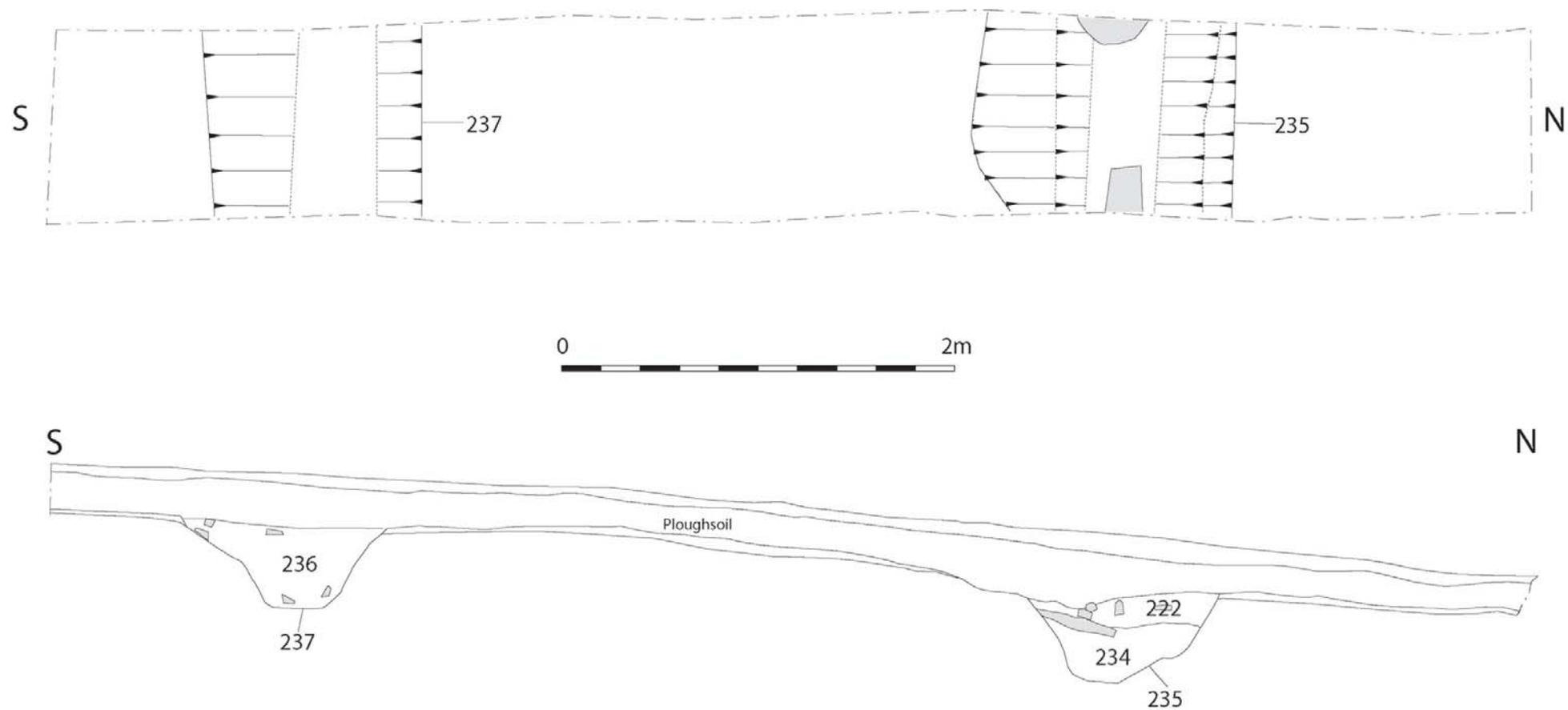


Figure 13: Trench 18 in plan and section

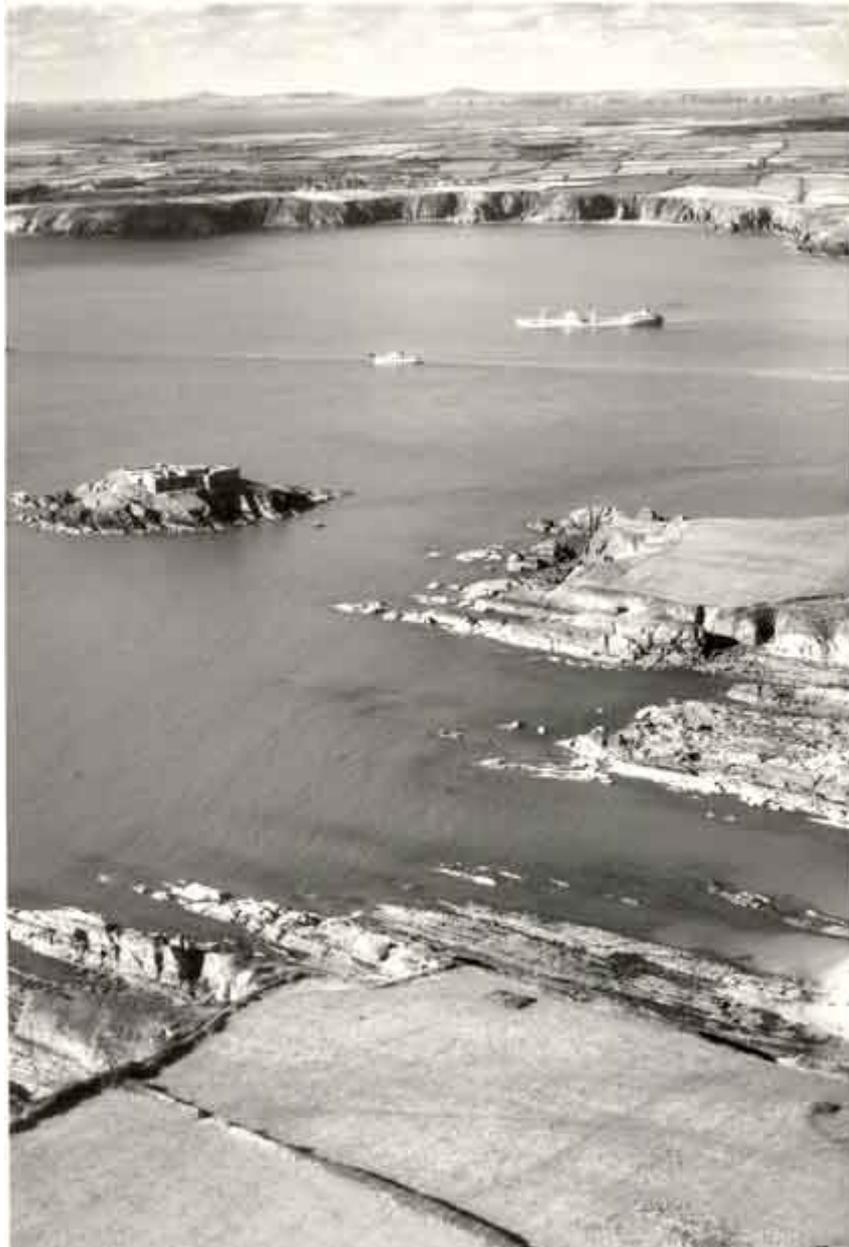


Photo 1: Aerial photograph of West Angle Bay taken in the 1950s. Note the upstanding earthwork of the funerary enclosure in the bottom right hand corner and the rectangular feature in the northwest corner of the field.



Photo 2: Cist Graves eroding from cliff face at SM 8501 0312



Photo 3: Cist grave eroding from cliff face at SM 8513 0308



Photo 4: West Angle Bay from the excavation site, looking northeast



Photo 5: Trench 15. Ditch cut 230 before excavation, looking east



Photo 6: Trench 15. Ditch cut 230 after excavation, looking east

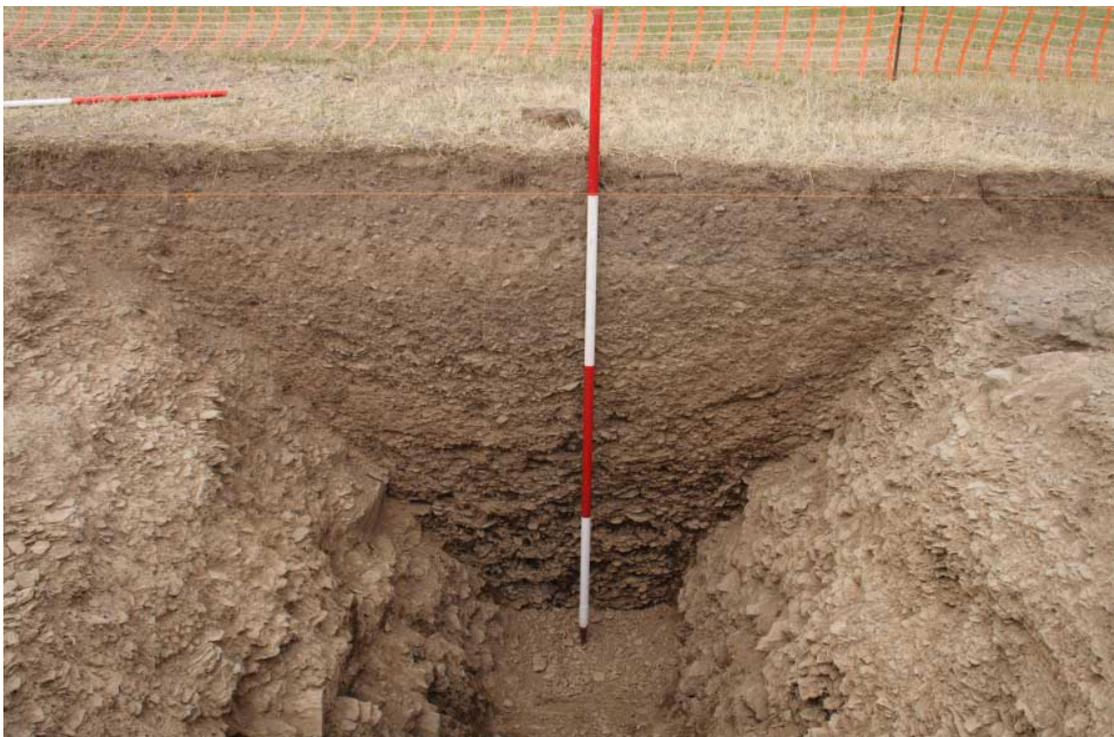


Photo 7: Trench 15. Section through ditch cut 230, looking north



Photo 8: Trench 13 at the end of the 2005 season, looking west



Photo 9: Cist burial 035



Photo 10: Cist Burial 039



Photo 11: Trench 13 in 2006 looking north, before excavation of cists and bank



Photo 12: The southern half of Trench 13 looking east, showing bank 045



Photo 13: The southern half of Trench 13 looking west



Photo 14: Trench 13 looking south, showing bank remnant and tumble (to left)



Photo 15: Detail of construction of stone-faced bank



Photo 16: Trench 13 looking south showing boundary ditch (to left) after Removal of stone bank and tumble



Photo 17: Trench 13 looking west showing boundary ditch (to left) after Removal of stone bank and tumble



Photo 18: Trench 13 looking west. Section through stones of bank 045



Photo 19: Trench 13 looking east. Section through ditch cut 238



Photo 20: Trench 13. Cist 059, looking south



Photo 21: Cist 043



Photo 22: Cist 211 with capstones removed



Photo 23: Cist 211 with burial



Photo 24: Cist 211 after excavation. Note grave cut 213 in base of top half of 211



Photo 25: Trench 18 looking northwest showing possible ditched trackway



Photo 26: Trench 18, cut 235 looking west



Photo 27: One of many site tours provided during the excavation

THE PEMBROKESHIRE CEMETERIES PROJECT EXCAVATIONS AT WEST ANGLE BAY 2008 Final Report

RHIF YR ADRODDIAD / REPORT NUMBER 2008/34

**Mawrth 2008
March 2008**

Paratowyd yr adroddiad hwn gan / This report has been prepared by Duncan Schlee

Swydd / Position: Project Manager

Llofnod / Signature Dyddiad / Date 31/03/2008

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
This report has been checked and approved by

ar ran Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position:

Llofnod / Signature Dyddiad / Date 31/03/2008

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadausydd gennyh ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any comments you may have on the content or presentation of this report