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Date: February 2010
Client: Kildare County Council
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N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 – Resolution, Kilcullen to Moone and Athy Link Road.

Final Report on archaeological investigations at Site E2993, in the townland of Gallowshill, Co. Kildare.

By: John Twomey
National Monuments Section Registration Number: E2993
Director: Lydia Cagney
NGR: 270540, 194535

Report Status: Final

Meanma agus Mianach

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Executive Summary

This final report presents the results of the archaeological resolution works carried out on behalf of Kildare County Council and the National Roads Authority as part of the Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. The works were undertaken prior to the commencement of construction of the N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. The Minister of the Environment, Heritage & Local Government, following consultation with the National Museum of Ireland, issued Directions to Kildare County Council on 8 March 2007 for archaeological resolution works relating to the road development. The registration number, E2993, was allocated by the Department for the excavation of the present site in Gallowshill townland under the directorship of Lydia Cagney of Headland Archaeology (Ireland) Ltd.

An Environmental Impact Assessment was published in 2003 for the Kilcullen to Powerstown Scheme, with Valerie J Keeley Ltd preparing the Archaeological, Architectural and Cultural Heritage Assessment. This formed Chapter 10 of the EIS produced by the Roughan and O'Donovan - Faber Maunsell Alliance. Geophysical prospection was carried out on certain areas of high archaeological potential by Bartlett-Clark Consultancy as part of the Environmental Impact Assessment, on behalf of Valerie J. Keeley Ltd/Kildare County Council.

Aerial photography was undertaken along the entire route selection as part of the non-invasive assessment after the EIA stage. This work was carried out in April 2004 by Markus Casey.

Archaeological testing carried out by CRDS Ltd for the N9/N10 Kilcullen to Waterford Scheme: Kilcullen to Powerstown. Archaeological Services Contract No. 2 – Test Excavations, Mullamast to Prumplestown and Athy Link Road under Ministerial Direction Number A021/188 on this site on 26 July 2006 identified an isolated pit containing burnt stone and ash deposits.

Full archaeological resolution was conducted on this site between 8 and 9 October 2007. The feature identified during testing were re-identified and established to be a trough associated with a number of deposits of burnt spread material which were dated to the Early Bronze Age. Post medieval and modern activity was also identified in the form of a stone filled drain, agricultural furrows, and a water pipe. A Preliminary Report of works on the site was completed by Headland Archaeology (Ireland) Ltd in March 2009.

1 Introduction

The N9/N10 Kilcullen to Waterford Road Scheme, of which the Kilcullen to Powerstown Scheme forms part, was proposed as a High Quality Dual Carriageway/Motorway, forming the Major Inter Urban route between Dublin and Waterford. The Kilcullen to Powerstown Scheme was advanced as a single entity up to the Compulsory Purchase Order/Environmental Impact Statement and was subsequently divided into two separate construction contracts: the Carlow By-pass (Phase 1) and the Kilcullen to Carlow Scheme (Phase 3). Kildare County Council, National Roads Design Office, has responsibility for overseeing the project management of these two schemes. The entire road scheme from Kilcullen to Waterford has now been designated as Motorway.

An Environmental Impact Assessment was published in 2003 for the Kilcullen to Powerstown Scheme, with Valerie J Keeley Ltd preparing the Archaeological, Architectural and Cultural Heritage Assessment. This formed Chapter 10 of the EIS produced by the Roughan and O'Donovan - Faber Maunsell Alliance. Geophysical prospection was carried out on certain areas of high archaeological potential by Bartlett-Clark Consultancy as part of the Environmental Impact Assessment, on behalf of Valerie J. Keeley Ltd/Kildare County Council.

Aerial photography was undertaken along the entire route selection as part of the non-invasive assessment after the EIA stage. This work was carried out in April 2004 by Markus Casey.

Construction commenced on Phase 1, the Carlow By-pass, in January 2006 and the road was completed and opened in May 2008. Construction of Phase 3, the Kilcullen to Carlow Scheme, which also includes a new single carriage link road to Athy town, commenced in January 2008.

Archaeological test-trenching was undertaken in advance of Phase 1, the Carlow By-pass, by Headland Archaeology (Ireland) Ltd between June and August 2005 (Archaeological Services Contract No. 3). This work identified 64 archaeological sites, which required archaeological excavation in advance of road construction. The resolution works for these sites were undertaken by Headland Archaeology (Ireland) Ltd between January and August 2006 (Archaeological Services Contract No. 4).

Archaeological test-trenching was undertaken in advance of the construction of Phase 3, the Kilcullen to Carlow Scheme, by IAC Ltd and CRDS Ltd, between October to November 2005 and May to August 2006 (Archaeological Services Contracts No. 1 and No. 2, respectively). This work resulted in the identification of 102 archaeological sites, which required resolution in advance of construction. The resolution works for these sites were undertaken by Headland Archaeology (Ireland) Ltd between March and December 2007 (Archaeological Services Contracts No. 5 and No. 6). This report details the results of one of those excavations, undertaken under NMSR Number E2993.

The project was funded by the Irish Government and the European Union through Kildare County Council/National Roads Authority, under the National Development Plan 2000-2006 and 2007-2013.

Construction Phases 2 and 4 relate to the section of road between Powerstown, Co. Carlow and the Waterford city By-pass and are project managed by Waterford County Council, National Roads Design Office.

2 Site description and location

Site E2993 was situated in the townland of Gallowshill, parish of St. Michaels, barony of Narragh and Reban East, Co Kildare, and was located 2.25 km east of the town of Athy at National Grid Reference: 270540/194535 (Figure 1). The site was located towards the northern end of a slip road which will connect the northern end of the Athy link road with the existing N78; immediately northeast of Athy. It was located in a large, flat, sub-rectangular field, just south of the boundary between Barkersford and Gallowshill townlands. The only known archaeological sites in the vicinity of E2993 in advance of the current road development were two burials (KD035-045001 and KD035-045002) recorded in Gallowshill townland 650 m to the south, a ringfort (KD035-025) in Shanrath townland 1 km to the south, an enclosure (KD035-040) was identified 750 m to the east in Foxhill townland, and an enclosure (KD035-019001) and field system (KD035-019002) recorded in Geraldine townland 800 m north (Figure 2).

Archaeological investigations undertaken as part of Archaeological Services Contract No. 5 on the road scheme identified a number of archaeological sites in the vicinity of site E2993. Site E2991 was 1.2 km to the southeast in Bray Upper townland and revealed a possible Late Neolithic settlement with pits, postholes, stakeholes, and a curvilinear slot (Clark 2009). Site E2986 was 1.8 km to the southwest revealed a medieval figure-of-eight shaped cereal drying kiln (Cagney and Kozlowska 2009c). Site E2985 was 1.9 km to the southeast and revealed postholes, pits, and a linear ditch, which were dated to the late Mesolithic and Early Bronze Age (Cagney and Kozlowska 2009b). Site E2983 was 2.2 km to the southeast and revealed a number of medieval pits and agricultural furrows (Cagney and Kozlowska 2009a). Site E2994 was 4.2 km to the southeast and revealed three Iron Age pits (Cagney and Kozlowska 2009d). Finally, site E2989 was 5.1 km to the east and revealed an Early Bronze Age ritual complex with two ringditches and associated pits including cremation burials (Moloney 2009).

3 Aims and methodology

The objective of the work was the preservation by record of any archaeological features that would be impacted by the proposed development, in advance of the road construction programme.

Topsoil stripping of the site was conducted using a 360° tracked machine fitted with a 1.9 m wide ditching (toothless) bucket under constant archaeological supervision. A total area of 99 m² was exposed. The resulting surface was cleaned and all potential features investigated by hand. Archaeological contexts were recorded by photograph and on *pro forma* record sheets. Plans and sections were drawn at scales of 1:20, 1:50 and 1:10 respectively. Registers are provided in the appendices (Appendices 1-5). Ordnance Datum levels and feature locations were recorded using Penmap and a total station theodolite.

Nine environmental samples were taken of any deposits suitable for analysis or dating as per Headland Archaeology (Ireland) Ltd environmental guidelines and following consultation with environmental archaeologist and archaeobotanist Karen Stewart and zooarchaeologist Dr. Auli Tourunen. All of the samples were processed in order to retrieve any palaeoenvironmental material that may aid in the interpretation of the site.

Full archaeological resolution was conducted on this site between 8 and 9 October 2007. The crew on site E2993 consisted of 1 director, 1 deputy site manager and 3 site assistants.

Following excavation, artefacts were analysed by the appropriate specialists and reports produced on the findings for incorporation into this report (see appendices).

4 Excavation results

Following topsoil removal, the pit identified in testing was re-identified along with a number of deposits of burnt spreads, a single stone filled drain, a number of agricultural furrows, and a modern pipe trench.

Trough
The remains of the trough (003) comprised a sub-oval shape cut into the natural yellow boulder clay, with its longest axis aligned in a northwest/southeast direction (Figure 4; Plates 2 and 3). It had a sharp break of slope at its top and vertical sides that gave way to a flat base with sharp break of slope. It measured 1.65 m x 0.96 m and was 0.60 m deep. Five deposits filled this cut. The basal layer (019) consisted of loosely compacted greyish sand infused with a high percentage of charcoal and quartz and had a length of 0.60 m, a width of 0.20 m, and a depth of 0.10 m. Over this lay a secondary fill comprising of burnt and heat-shattered stones (some of which were unbroken angular and decalcified) within a moderately compacted greyish black matrix of charcoal-rich sandy silt (017). This had a length of 1.20 m, a width of 0.22 m, and a depth of 0.35 m. The upper fills in trough (003) represented infilling of the feature. A moderately compacted greyish black deposit (018) composed of ash and clayey silt with charcoal inclusions, measuring 1.10 m in length, 0.22 m in width, and 0.20 m deep represented the tertiary fill within this trough. Occasional heat-affected stones were banked against the northern side of this deposit at its interface with the underlying (017); otherwise this layer was stone free. The above episodes of activity appear to signify the final use of this feature, with the overlying deposits being indicative of deliberate infilling and silting respectively.

A small layer of moderately compacted orangish brown sandy clay (016) was deposited over (017) measuring 0.72 m in length and width, and 0.08 m in depth. All of these layers were sealed by (015), a moderately compacted dark brown clayey silt mixed with peat and containing inclusions of charcoal flecking which had a length of 1.65 m, a width of 0.56 m, and a depth of 0.10 m. .

Burnt spreads (Figure 3)
A shallow lens of material (005) (Figure 5), probably representing the basal remnants of a burnt spread, was uncovered at the western side of the site. This was visible as a shallow irregular deposit consisting of loosely compacted light brown clayey sand with frequent charcoal and small heat shattered stone inclusions. It extended 0.65 m northwest/southeast by 0.48 m, and had a depth of 0.05 m.

A shallow deposit of similar material (008) comprising loosely compacted grey clayey sand, containing frequent charcoal and heat shattered stone inclusions was located 1.70 m north of spread (005) and truncated by the furrow (007), (Plate 3). This measured 0.70 m northwest/southeast by 0.70 m, and had a depth of 0.10 m. A radiocarbon date of 2280–1940 cal BC (2σ) (SUERC-25454) (Appendix 8) was attained from hazel charcoal retrieved from this deposit placing it firmly within the Early Bronze Age.

Located 1.50 m east of (008) was a deposit of loosely compacted brownish grey sandy silt (011) which contained inclusions of small, angular heat shattered stones. This measured 0.55 m north/south by 0.33 m, and had a depth of 0.08 m.

A fourth spread (013), composed of loosely compacted blackish grey sandy silt and containing a high percentage of charcoal and heat shattered stones, was located 1.50 m northeast of (011). This measured 0.93 m north/south by 0.70 m, and had a depth of 0.07 m.

Stone filled drain
A linear, stone-filled drain (014) orientated northwest/southeast had truncated the western side of the trough (003) and its upper fills (Figure 3; Plates 2 and 3). This drain had a width of 0.40 m, a depth of 0.40 m, and had sharp breaks of slope on top, vertical sides, a flat base with sharp breaks of slope and extended across the site and beyond the CPO. Its basal fill (021) consisted of stones to a depth of 0.20 m; many of these were flat and rounded while others were more angular. The drain was subsequently back-filled for another 0.20 m by (020), a light brown clayey silt which probably originated from an old, overlying topsoil (Plate 4).

Furrows and modern activity
Six linear furrows were identified traversing the site (Figures 3 and 6; Plates 1 and 4). Five of these were represented by a single cut number (025). They had linear shapes in plan, with gradual breaks of slope on top, gradually sloping sides, and flat bases with gradual breaks of slope. All measured 0.45 m wide and had an average depth of 0.12 m. A single fill of firmly compacted light yellowish grey clayey sand (026) was contained within each of the furrows.

In the northwestern section of the site a single northeast/southwest orientated furrow (007) was identified extending southwest and beyond the CPO. This was recorded for a length of 4 m and had sharp breaks of slope on top, steep sides, and a flat base with sharp breaks of slope. It truncated two of the furrows represented by (025) along with the spread (008), and contained a single fill of loosely compacted grey clayey sand (008) with inclusions of charcoal and burnt stones which appear to be elements of the truncated spread.

A linear, stone-filled drain (014) orientated northwest/southeast had truncated the western side of the trough (003) and its upper fills. This drain had a width of 0.40 m, a depth of 0.40 m, and had sharp breaks of slope on top, vertical sides, a flat base with sharp breaks of slope and extended across the site and beyond the CPO. Its basal fill (021) consisted of stones to a depth of 0.20 m; many of these were flat and rounded while others were more angular. The drain was subsequently back-filled for another 0.20 m by (020), a light brown clayey silt which probably originated from an old, overlying topsoil (Plate 4).

A narrow, linear modern pipe trench (022) containing a redundant iron water pipe ran perpendicular to, and truncated the drain (014) and the furrows (025). This had sharp breaks of slope on top, near vertical sides, and a tapered rounded base. It contained a single fill of firmly compacted light yellowish brown clayey silt with occasional inclusions of pebbles which had been backfilled around the piping.

5 Discussion

The results of the excavation at Gallowshill are discussed here following stratigraphic, environmental, dating and artefactual analysis. The site is then discussed on a local level and related to other sites known in the vicinity (including those discovered on the current scheme). Finally the site is discussed on a national level in an attempt to place it in context and assess how it contributes to the archaeological record in general.

Site Chronology and development

Although the site was relatively small in scale, two defined phases of activity were identified.

Phase I: The shallow deposits of burnt spread and the presence of a trough (053), indicate that this site, E2886, represents the remains of a *fulacht fiadh*. The deposits of burnt and heat-shattered stone within a charcoal rich silty matrix are typical of the composition of a burnt mound, or *fulacht fiadh*. Similar sites have returned dates ranging from the Bronze Age to the late medieval period. However the majority of such sites are Bronze Age in date (Waddell 2000).

Phase II: The linear stone filled drain and the agricultural furrows represent the impact of post medieval farming practices upon the landscape. All follow a similar orientation to the adjacent field boundary which also acts as a townland boundary and remains unchanged since the 1st Edition Ordnance Survey map no. KE-035 of 1839. Henry French an American judge and farmer noted in the 1850s the use of stone drains in Ireland in a method which was 'convenient and secure' for common and small drains (French 1859, 117). The water pipe post-dates all of these features.

Dating evidence: While the features associated with Phase II can clearly be placed in the post-medieval/modern period, dating the activities associated with Phase I relies on the radiocarbon date obtained from context (056). The radiocarbon determination returned from spread (008) in context produced a date range of 2280-1940 cal BC (2σ) (SUERC - 25454), placing the site in the Early Bronze Age. This compares well to the dates obtained from burnt mound sites excavated as part of the N9/N10 scheme (see Table 1).

NMSR No.	Calibrated Age Ranges (2 σ)	Dating Framework	Reference
E2858	2470 – 2200 cal BC	Early Bronze Age	Stephenson, 2009
E2867	2340 – 2140 cal BC	Early Bronze Age	Hanbidge, 2009a
E2939	4550 – 4370 cal BC	Neolithic	Doyle, 2009a
E2940	1440 – 1050 cal BC	Middle Bronze Age	Doyle, 2009b
E2942	2140 – 1500 cal BC	Early Bronze Age	Doyle, 2009c
E2943	1940 – 1680 cal BC	Early Bronze Age	Doyle, 2009d
E2953	2460 – 1940 cal BC	Early Bronze Age	Tobin, 2009
E2981	350 – 120 cal BC	Iron Age	Dennehy and Mallia-Guest, 2009
E2995	1630 – 1410 cal BC	Middle Bronze Age	Doyle, 2009e

Table 1 – Radiocarbon dates returned from burnt mounds excavated in the vicinity of E2993

Burnt Mounds

Distribution and Morphology: There are over 4500 burnt mounds/*fulacht fiadh* to be found in Ireland, with new sites being identified on a regular basis due to the increase in new infrastructure work throughout the country. The majority of known *fulachta fiadh* are located in counties Cork (over 2000), Waterford, Kilkenny and Tipperary. Modern excavation and survey evidence indicates that these burnt mounds occur not as isolated monuments in the landscape but as important indicators of Bronze Age settlement (Brindley, Lanting and Monk 1990). Previous knowledge of burnt mounds in the vicinity of Gallowshill was restricted to a possible burnt mound in Bolton townland (KE038-060) 9.8 km to the southwest, and a cluster of three possible burnt mounds in Balkinstown townland (KE027-032, KE027-033, and KE027-034) 10.25 km to the northeast. A total of twenty two other burnt mounds were excavated between Kilcullen and Prumplestown in advance of the construction of the N9/N10 Kilcullen to Waterford Road Scheme alone.

The size of a mound is often taken as an indicator of the number of uses or length of occupation. Given the lack of a mound or associated features with this trough it would appear minimal use was made of the feature. However, modern farming practises and field clearance often remove all or part of mounds so that all that is left is a few burnt stone spreads and a series of pits or troughs. This was also the case at Busherstown Co. Carlow (Breen and O'Connell 2009) where excavations uncovered a trough and pit containing heat shattered stone with an absence of any burnt mound. Such activity may also explain the scattering of spreads (004), (007), (010) and (012), all of which are located west/northwest of the trough (003)

The first site of this type to be scientifically dated was at Ballyvourney in Co. Cork. The site consisted of two burnt stone mounds which were excavated in the 1950s by M.J. O'Kelly (1954). Underneath one of these mounds, Ballyvourney I, was a wood-lined trough, two hearths, a stone lined pit/oven and a number of postholes which were part of a small hut structure. This site became the classic example of a *fulacht fiadh,* but excavations of burnt stone mound sites since Ballyvourney have shown that it was the exception rather than the norm (Ó Néill 2003-4, 89). Other burnt mound sites from around the country show that these site types were very diverse with the main similarities being the presence of a mound of burnt stone, a trough or pit feature underneath and a nearby water source.

Trough: The characteristics of this feature in its size and morphology support its interpretation as a trough. Troughs were often, though not always, lined with some impervious material such as clay, wood, stone or leather. Unlined troughs are known from such sites as Commons, Co. Limerick (Taylor and Bartlett 2004, 314-15) where a sub-oval trough was found under a burnt mound. The excavators thought that this trough would have naturally filled with and retained water due to the water table and the natural sub-soil making the lining of it unnecessary.

Function: The technology of burnt mounds/*fulachta fiadh* is well known. Stones were heated in a nearby fire and placed in a water-filled trough – sometimes lined with timber, stones, clay or reed matting– the heat from the stones would then bring the water to boil. Once cool the stones were removed from the trough and discarded, creating a characteristic burnt mound or spread of heat-shattered stones. A nearby water source would have been required in order to fill the troughs for boiling episodes. The extent of the mound in relation to the volume of the troughs would point to their being re-used on a number of occasions. How the boiled water was subsequently utilised, however, is more difficult to ascertain.

There are a number of theories with regards to the function of *fulacht fiadh*/burnt mound monuments. Interpretations of *fulachta fiadh* vary from the traditional view of them as cooking sites, to alternative uses for bathing and birthing places, sweathouses, ritual, industrial uses such as dying or fulling or possibly sites for processing leather and textiles. (Grogan *et al.* 2007, 99-100). Other uses have also been put forward such as brewing (Moore and Quinn 2007, 8-9). It is generally accepted that the function of *fulacht fiadh* troughs was to boil water, but how this water was subsequently utilised is notoriously difficult to ascertain. So far no specific evidence has been identified from the troughs to indicate how the hot water was used, and none of the possibilities i.e. cooking, washing, tanning, brewing etc. can be ruled out. A nearby water source would have been required in order to fill the troughs for boiling episodes. No obvious water supply was evident within the vicinity of this trough. However it is possible that modern drainage has altered the hydrological properties of the area or that the site was exploited on a seasonal basis dependent on the water table levels

The theory with the most corroborating evidence is that which suggests that the sites were used for cooking. Experimental work by O'Kelly (1954) demonstrated that a joint of meat could be cooked in three to four hours using hot stones to boil water in a trough, while Allen describes an experiment in

which the meat was cooked in two hours (1994, 9). It has been noted that a distinct lack of food refuse such as animal bones is characteristic of scientifically excavated burnt mound sites; however it could be that the cooking of joints of meat was subject to various sorts of ritual or hygiene controls and that any food remains were carefully disposed of (Waddell 2000, 177). Monk has recently shown, however, that although many bones are likely lost to acidic soil, an increasing number of sites are now producing preserved bone (2007, 22). A recent preliminary study undertaken by Auli Tourunen and Karen Stewart on the pH levels of *fulachta fiadh* showed that there was no correlation between the pH value of a site and bone preservation (Tourunen and Stewart 2008). They caution, however, that this information is preliminary and that a wide range of factors may have contributed to bone preservation or the lack of bone so that the use of animal products at individual sites can not be ruled out by these means alone (*ibid.*). No animal bone was recovered in association with the trough at Gallowshill.

Additional support is provided for the cooking hypothesis by detailing the importance of meat fat in food preservation (Monk 2007, 23). Without cooking trays, he notes, gathering the fat would have been problematic (*ibid.*). One solution, however, is to boil the meat and collect the fat from the surface of the water, an activity for which *fulachta fiadh* are ideally suited (*ibid.*). The presence of fats in the water of *fulachta fiadh* is also supported with the literary evidence in the story of Mis and Dubh Ruis (O'Kelly 1954). Although this again combines the two possible functions of cooking and bathing, the fats may have been used in this way.

The association of these sites with highly mobile groups is debated however; the use of *fulachta fiadh* is much more time intensive than roasting meat over a fire and would point to a more sedentary group but few settlements are found in the area surrounding them. This implies the food would then have to be carried large distances if it were to be consumed by more people than those who cooked it. Charcoal from spread (008) was identified as hazel and is likely to reflect the utilisation of local flora for fuel. Hazel would have been a tree common across Ireland during this period and has been identified at a number of other burnt mound sites (Appendix 7). Grogan *et al.* (2007, 91) have concluded from the quantities of heat-shattered stone forming most spreads and mounds that sites were likely used multiple times on separate occasions and that most sites would have had an extended, if periodic, use history.

Conclusions

The evidence from the other sites in its vicinity support the notion that site E2993 should not be viewed in isolation but rather as part of a greater archaeological landscape. Situated 1.8 km to the southeast in Foxhill townland (E2985) a possible Early Bronze Age settlement was uncovered as part of this road scheme. Postholes, pits, and a ditch were revealed, suggesting domestic activities were undertaken here, though no coherent structure was definable from the remains within the site (Cagney and Kozlowska, 2009b). Early Bronze Age activity was also evident 5.1 km to the east in Burtown Little townland (E2989) where an Early Bronze Age ritual complex was identified. Excavations revealed the remains of two Early Bronze Age ring-ditches along with associated pits and cremations (Moloney, 2009). Earlier activity in this locality was also revealed with the discovery of a possible Neolithic settlement consisting of pits, postholes, stakeholes, and a curvilinear slot in Bray Upper (E2991) (Clark 2009).

Other evidence of Early Bronze Age use and occupation of the surrounding landscape has come to light during the course of these excavations in County Kildare in the form of burial sites: Moone (E2980) (Hackett 2009), a flat cemetery with two cremations (one urned), 13 pit burials, 1 cist burial,

with associated grave goods of pottery, copper jewellery and flint artefacts; and Ballymount (E2873) (McCarthy 2009), a crouched inhumation burial.

These sites show a continuation of human activity in this locality throughout the Bronze Age, and also reflect the wide range of activities being undertaken by these people.

All the archaeology related to this site within the CPO has been resolved.

6 Archive quantities

The site archive is comprised of the following materials:

Item	Quantity
Context Sheets	23
Plans	4
Sections	7
Photographs	97
Registers	5
Notebooks	1

The archive material is contained within 1 box.

Storage of the archive in a suitable format and location is required in order to provide for any future archaeological research. It is proposed that in addition to the paper archive a digital copy is prepared. The archive is currently stored in the offices of Headland Archaeology (Ireland) Ltd., Unit 1, Wallingstown Business Park, Little Island, Co. Cork. It is proposed that following completion of post-excavation analysis, the archive is appropriately deposited in consultation with the National Museum of Ireland.

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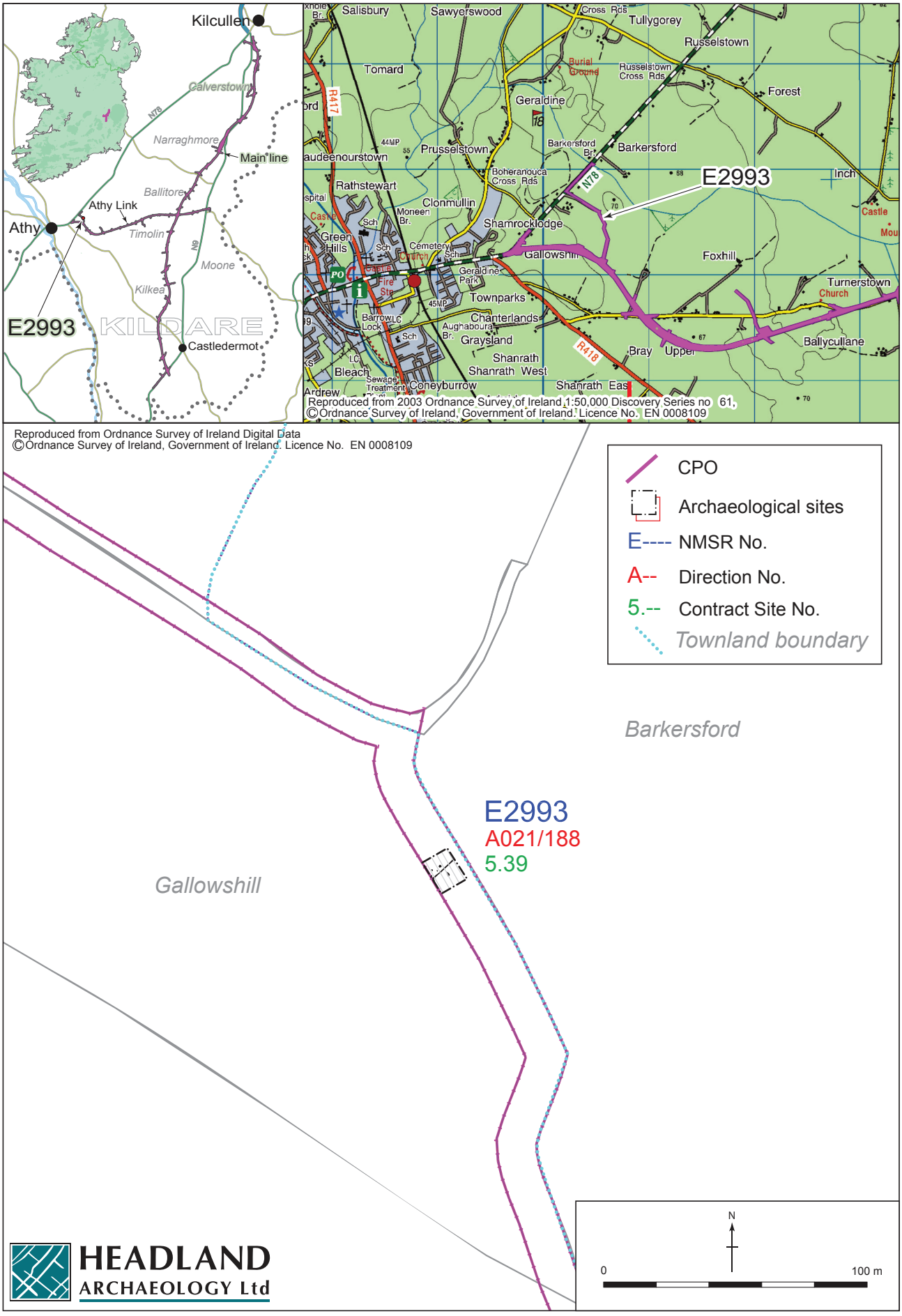


Figure 1 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. E2993, Site location.

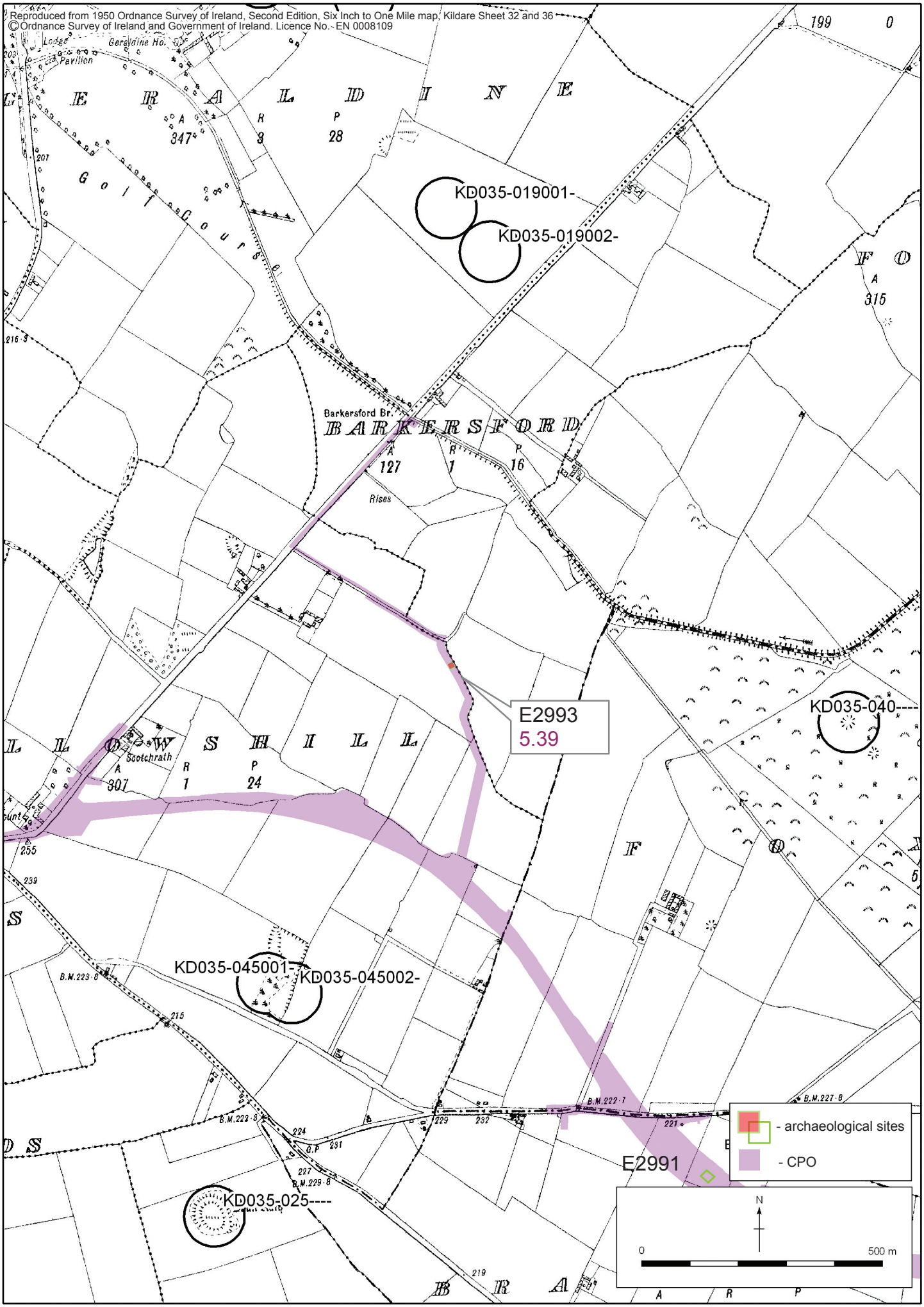


Figure 2 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. E2993, Extract from RMP.

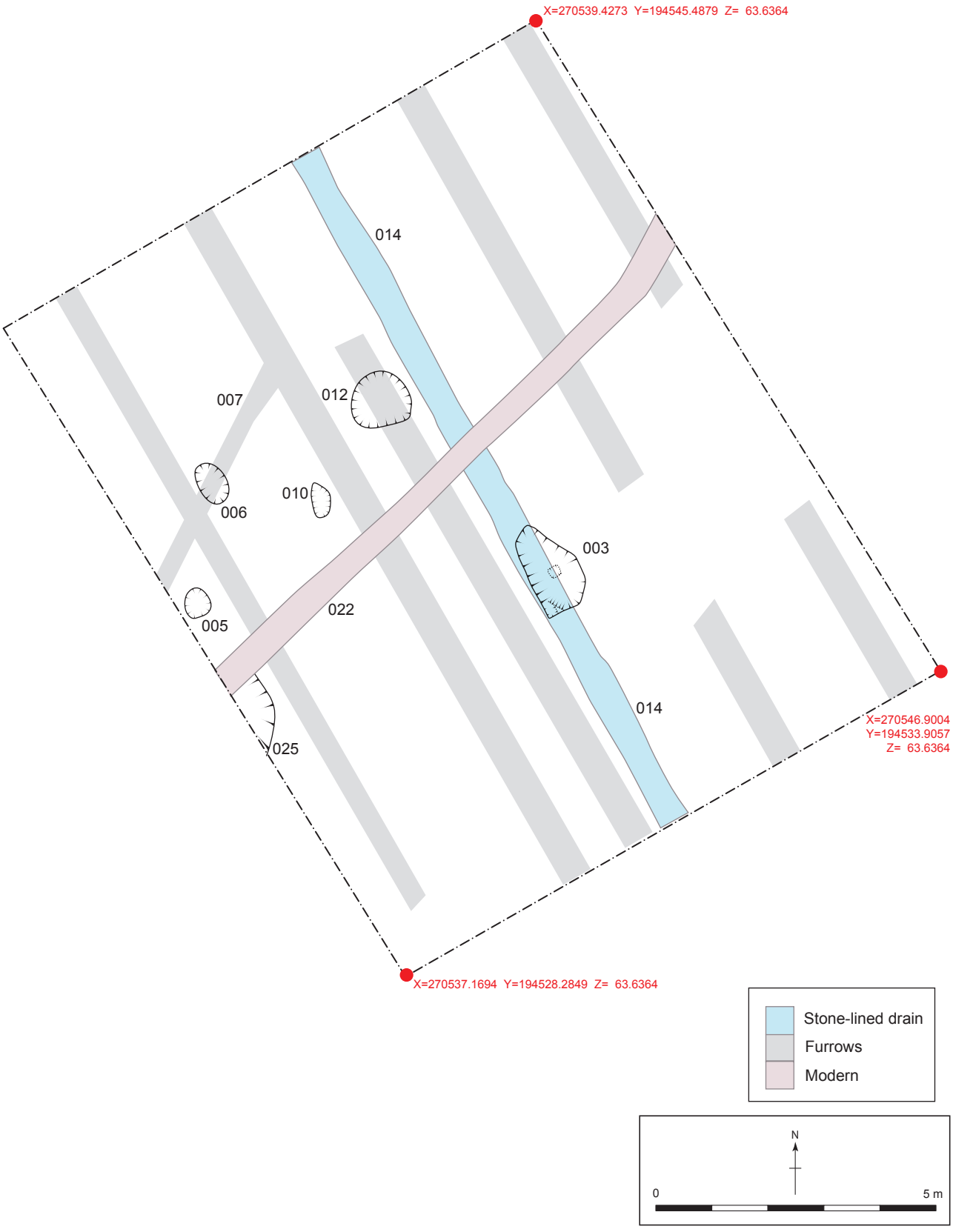


Figure 3 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. E2993, Site layout.

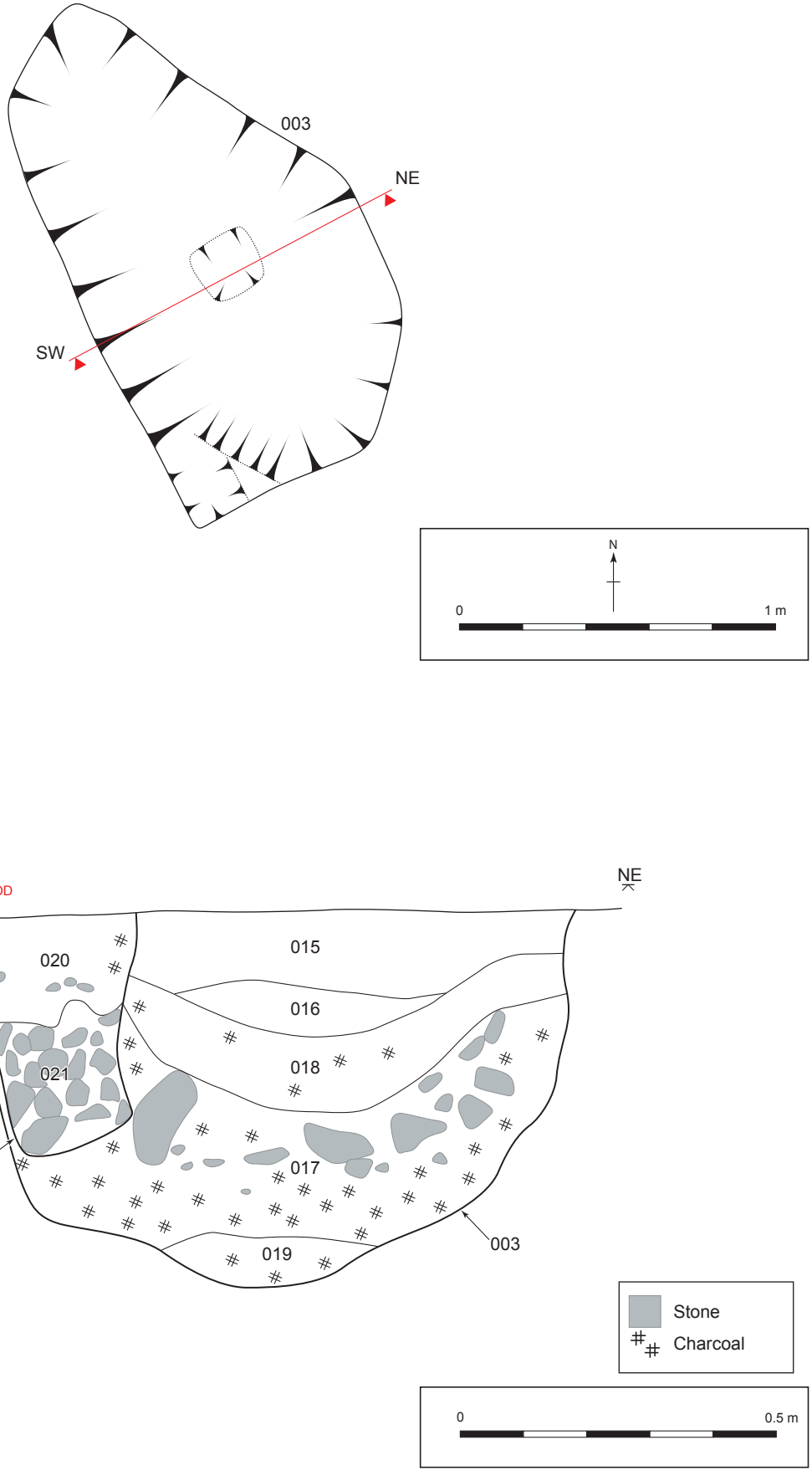


Figure 4 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. E2993, Plan of and southeast-facing section through trough (003).

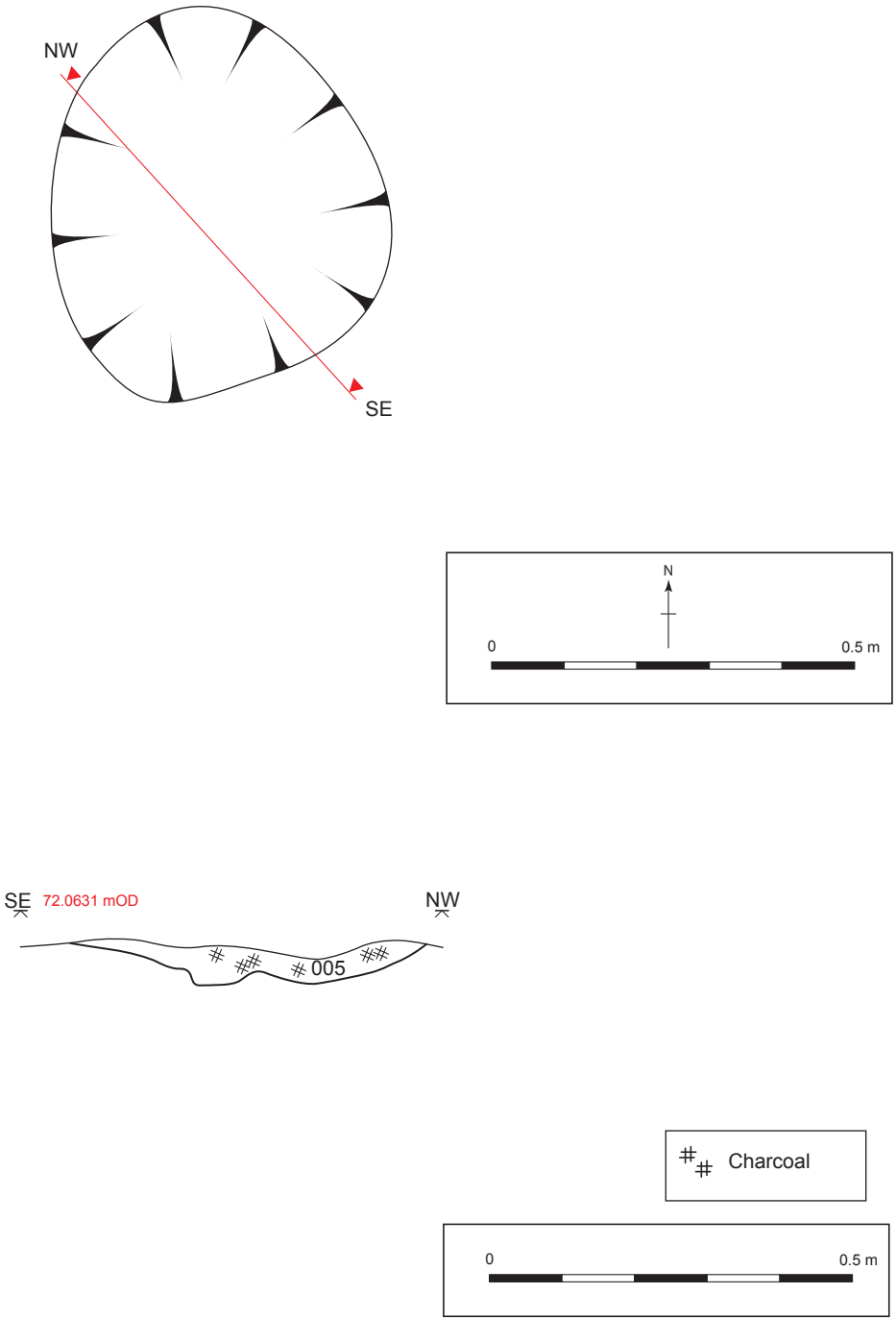


Figure 5 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. E2993, Plan and northeast-facing section through burnt spread (005).

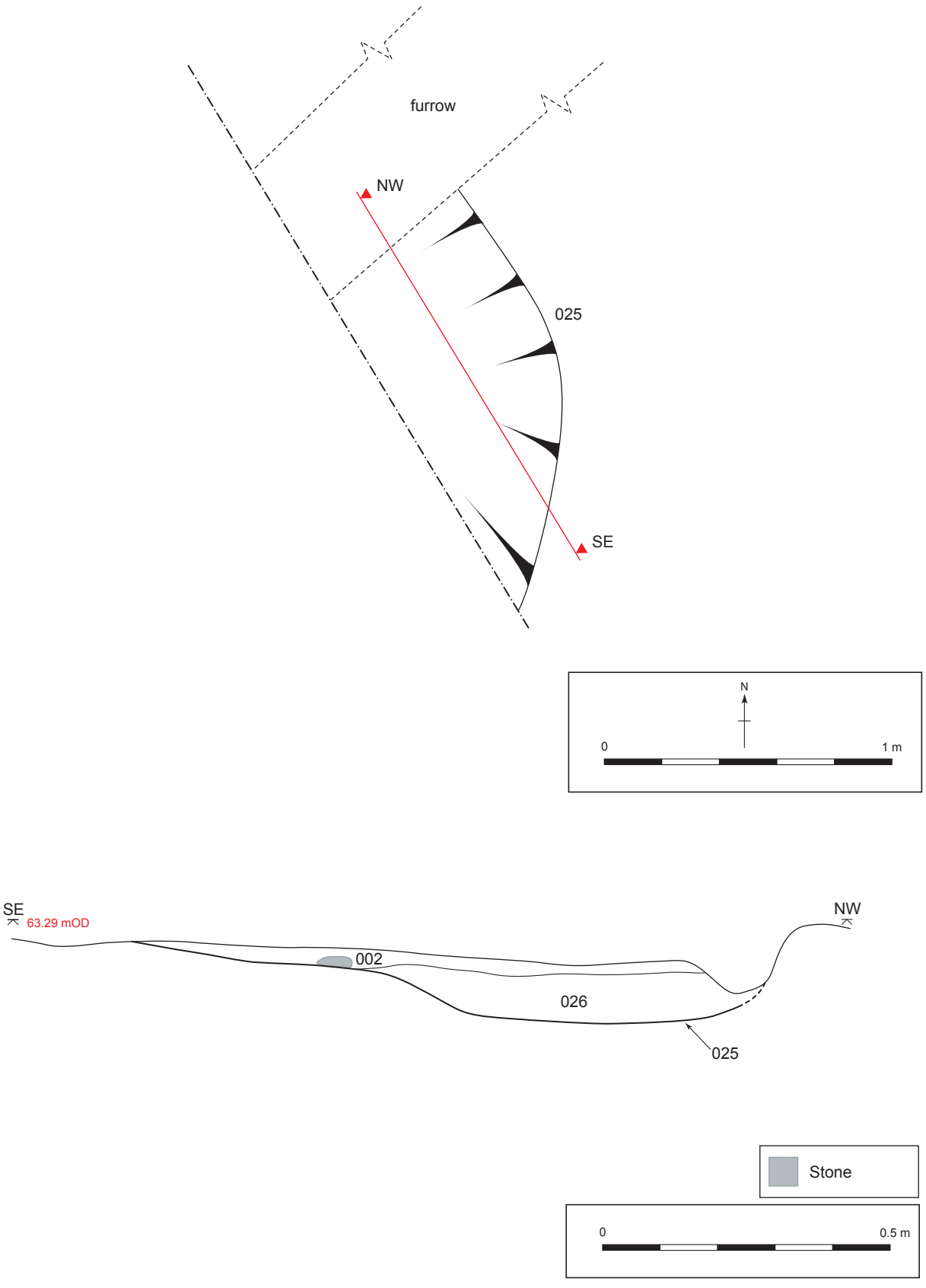


Figure 6 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. E2993, Plan of and northeast-facing section through furrow (025).

Plate 1 - Pre-excavation shot of the site, facing northwest.

Plate 2 - Mid-excavation shot of trough (003) and field drain (014), facing north.

Plate 3 - Post-excavation shot of trough (003) and field drain (014), facing southeast.

Plate 4 - Post-excavation shot of the site, facing southeast.

Appendix 1 – Context Register for Site E2993

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(001)	Deposit	-	-	Site-wide	Site-wide	-	Mottled yellowish brown sandy clay and yellowish grey sandy clay with moderate small and medium-sized stone inclusions.	Subsoil
(002)	Deposit	-	-	Site-wide	Site-wide	0.25	Moderately compacted, dark brown clayey silt with moderate small stone inclusions.	Topsoil
(003)	Cut	-	(015), (016), (017), (018), (019)	1.65	0.96	0.60	Sub-oval shape in plan with north/south orientation. It had a sharp break of slope at its top and vertical sides that gave way to a flat base with sharp breaks of slope	Cut of trough
(004)	Void	-	-	-	-	-	-	Void
(005)	Deposit	-	(006) (007)	0.48	0.48	0.05	Light brown clayey sand with moderate charcoal and small stone inclusions	Shallow deposit
(006)	Void	-	-	-	-	-	-	Void
(007)	Cut	-	(009)	4.00	0.30	0.10	Linear shape in plan with a northeast/southwest orientation. It had a sharp break of slope at its top, vertical sides, and a flat base with a sharp break of slope.	Cut of furrow
(008)	Deposit	-	-	0.70	0.70	0.10	Clayey sand containing frequent charcoal and heat-shattered stone inclusions. Truncated by furrow (007)	Burnt spread deposit
(009)	Fill	(007)	-	4.00	0.30	0.10	Soft, brown and yellow sandy clay containing occasional small stone inclusions.	Single fill of furrow (007)
(010)	Void	-	-	-	-	-	-	Void
(011)	Fill	(010)	-	0.55	0.33	0.08	Shallow, irregular deposit of burnt mound material; it was irregular in plan and comprised a brownish grey silty sand containing frequent heat-shattered stone inclusions.	Shallow burnt spread deposit
(012)	Void	-	-	-	-	-	-	Void

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(013)	Fill	(012)	-	0.93	0.70	0.07	Shallow irregular deposit of burnt mound material; it was irregular in plan and comprised a blackish grey sandy silt containing frequent charcoal (30%) and heat-shattered stone inclusions.	Basal remains of burnt spread deposit
(014)	Cut	-	(020)	Extends beyond CPO	0.40	0.40	Northwest/southeast orientated stone drain with a sharp break of slope at the top, vertical sides that terminate at a flat base with a sharp break of slope.	Cut of stone drain
(015)	Fill	(003)	-	0.60	0.56	0.10	Moderately compacted, dark brown, clayey silt containing occasional charcoal flecks.	Upper fill of trough (003)
(016)	Fill	(003)	-	0.36	0.36	0.08	Moderately compacted, sterile orangish brown sandy clay	Fourth fill of trough (003)
(017)	Fill	(003)	-	0.60	0.35	0.35	Moderately compacted, greyish black deposit of ash and clayey silt containing 20% charcoal inclusions	Tertiary fill of trough (003)
(018)	Fill	(003)	-	0.55	0.22	0.20	Moderately compacted dark greyish black burnt and heat-shattered stones contained within a matrix of charcoal-rich sandy silt with a moderate quantity of large, intact but calcified stones also included	Secondary fill of trough (003)
(019)	Fill	(003)	-	0.30	0.20	0.10	Moderately compacted, light grey deposit of silty sand containing 5% charcoal inclusions.	Basal fill of trough (003)
(020)	Fill	(014)	-	Extends beyond CPO	0.40	0.20	Moderately compacted, light brown clayey silt	Upper fill of stone drain (014)
(021)	Fill	(014)	-	Extends beyond CPO	0.40	0.20	Loose deposit of medium sized rounded and angular stones	Basal fill of stone drain (014)
(022)	Cut	-	(023), (024)	Extends beyond CPO	0.28	0.40	East/west orientated linear with sharp breaks of slope on top, near vertical sides, and a flat base with sharp breaks of slope.	Cut of modern pipe trench
(023)	Fill	(022)	-	Extends beyond	0.28	0.20	Firmly compacted light yellowish brown clayey silt	Upper fill of modern pipe trench (022)

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
				CPO				
(024)	Fill	(022)	-	Extends beyond CPO	0.28	0.20	Moderately compacted light brownish yellow clayey with occasional stone inclusions	Basal fill of modern pipe trench (022)
(025)	Cut	-	(026)	Extends beyond CPO	0.45	0.12	Irregular shape in plan with a gradual break of slope at its top and gently sloping sides that gave way to a rounded base with a gradual break of slope.	Cut of furrow
(026)	Fill	(025)	-	Extends beyond CPO	0.45	0.12	Firmly compacted greyish yellow clayey sand containing occasional small pebble inclusions.	Single fill of furrow (025)

Appendix 2 – Finds Register for Site E2993

Find no.	Material	Type	Identification	Description
E2967:021:001	Metal	Iron	Modern	Corroded and fragmented metal sheeting

Appendix 3 – Sample Register for Site E2993

Sample no.	Context no.	Description
E2967:001	(005)	Light brown clayey sand with moderate charcoal and small stone inclusions
E2967:002	(008)	Clayey sand containing frequent charcoal and heat-shattered stone inclusions.
E2967:003	(009)	Soft, brown and yellow sandy clay containing occasional small stone inclusions.
E2967:004	(015)	Moderately compacted, dark brown, clayey silt containing occasional charcoal flecks.
E2967:005	(016)	Moderately compacted, sterile orangeish brown sandy clay
E2967:006	(018)	Moderately compacted dark greyish black burnt and heat-shattered stones contained within a matrix of charcoal-rich sandy silt with a moderate quantity of large, intact but calcified stones also included
E2967:007	(017)	Moderately compacted, greyish black deposit of ash and clayey silt containing 20% charcoal inclusions
E2967:008	(019)	Moderately compacted, light grey deposit of silty sand containing 5% charcoal inclusions.
E2967:009	(020)	Moderately compacted, light brown clayey silt

Appendix 4 – Photo Register for Site E2993

Photo Number	Direction facing	Description
E2993:001	Northeast	Pre-excavation shot of (008) and (007)
E2993:002	Northeast	Pre-excavation shot of (008) and (007)
E2993:003	Northeast	Pre-excavation shot of (004)
E2993:004	Northeast	Pre-excavation shot of (004)
E2993:005	Northeast	Pre-excavation shot of (004)
E2993:006	Northwest	SE-facing section through (004)
E2993:007	Northwest	SE-facing section through (004)
E2993:008	Northwest	SE-facing section through (004)
E2993:009	Northwest	SE-facing section through (004)
E2993:010	Northwest	SE-facing section through (004)
E2993:011	Northwest	SE-facing section through (004)
E2993:012	West	Pre-excavation shot of (025)
E2993:013	West	Pre-excavation shot of (025)
E2993:014	Northwest	Pre-excavation shot of (025)
E2993:015	Northeast	Pre-excavation shot of burnt spread (013)
E2993:016	Northeast	Pre-excavation shot of burnt spread (013)
E2993:017	Southwest	Mid-excavation shot of trough (003)
E2993:018	Southwest	Mid-excavation shot of trough (003)
E2993:019	Southwest	Mid-excavation shot of trough (003)
E2993:020	Southwest	Mid-excavation shot of trough (003)
E2993:021	Southwest	Mid-excavation shot of trough (003)
E2993:022	West	Mid-excavation shot of trough (003)
E2993:023	Northeast	Mid-excavation shot of trough (003), working shot
E2993:024	Northeast	Mid-excavation shot of trough (003), working shot
E2993:025	Northeast	SW-facing section through (011)
E2993:026	Northeast	SW-facing section through (011)
E2993:027	Northeast	SW-facing section through (013)
E2993:028	Northeast	SW-facing section through (013)
E2993:029	Southwest	Working shot of (003)
E2993:030	Northwest	Working shot of (003)
E2993:031	West	Working shot of (003)
E2993:032	North	Working shot of (003)
E2993:033	Northeast	S-facing section of (003) and (014)
E2993:034	Northeast	S-facing section of (003) and (014)
E2993:035	Northeast	S-facing section of (003) and (014)
E2993:036	Northeast	S-facing section of (003) and (014)
E2993:037	Northeast	S-facing section of (003) and (014)
E2993:038	Northeast	S-facing section of (003) and (014)
E2993:039	Northeast	S-facing section of (003) and (014)
E2993:040	North	Mid-excavation shot of trough (003)
E2993:041	North	Mid-excavation shot of trough (003)
E2993:042	North	Mid-excavation shot of trough (003)
E2993:043	South	Mid-excavation shot of trough (003)
E2993:044	South	Mid-excavation shot of trough (003)
E2993:045	South	Mid-excavation shot of trough (003)

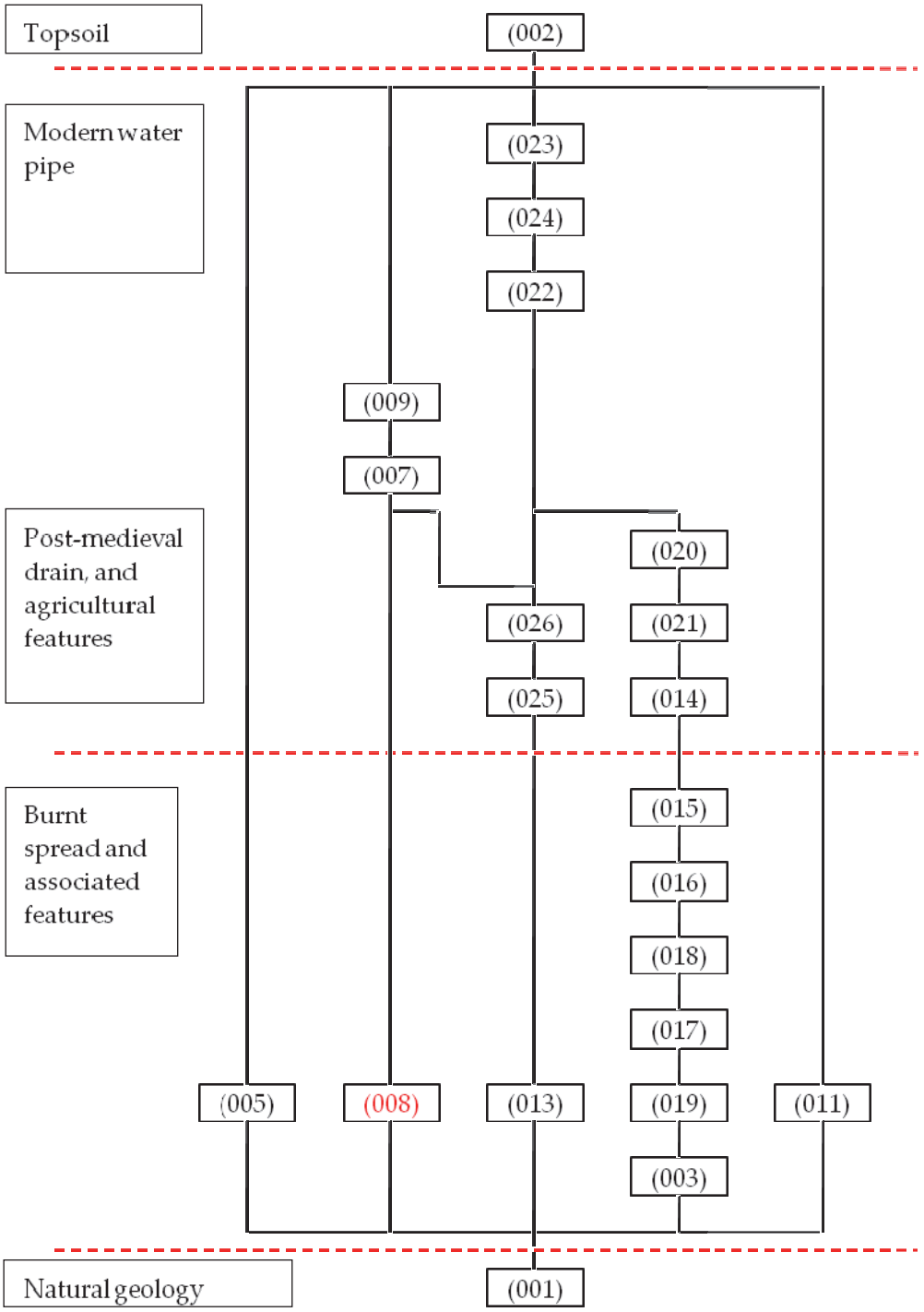
Photo Number	Direction facing	Description
E2993:046	Southeast	Mid-excavation shot of stone drain (014)
E2967:047	Southeast	Mid-excavation shot of stone drain (014)
E2967:048	Southeast	Mid-excavation shot of stone drain (014)
E2967:049	Southeast	Mid-excavation shot of stone drain (014)
E2967:050	Southeast	Mid-excavation shot of stone drain (014) and (003)
E2967:051	Southeast	Mid-excavation shot of stone drain (014) and (003)
E2967:052	South	Mid-excavation shot of stone drain (014) and (003)
E2967:053	Southeast	Mid-excavation shot of stone drain (014) and (003)
E2967:054	Southeast	E-facing section of (022)
E2967:055	Southeast	E-facing section of (022)
E2967:056	Southeast	E-facing section of (022)
E2967:057	Northeast	Post-excavation shot of (022)
E2967:058	Southeast	Post-excavation shot of (022)
E2967:059	Southeast	Post-excavation shot of (022)
E2967:060	Southeast	Post-excavation shot of (022)
E2967:061	Southeast	Post-excavation shot of (022)
E2967:062	Northeast	Working shot of site
E2967:063	Northeast	Working shot of site
E2967:064	Northeast	NE-facing section of (025)
E2967:065	East	NE-facing section of (025)
E2967:066	Northeast	NE-facing section of (025)
E2967:067	Northeast	Working shot of (003)
E2993:068	Southeast	Working shot of (003)
E2993:069	Southeast	Working shot of (003)
E2993:070	East	Post-excavation shot of (003)
E2993:071	Southeast	Post-excavation shot of (003)
E2993:072	East	Post-excavation shot of (003)
E2993:073	West	Post-excavation shot of (003)
E2993:074	West	Post-excavation shot of (003)
E2993:075	Southwest	Post-excavation shot of (003)
E2993:076	Southeast	Post-excavation shot of (003) showing (014)
E2993:077	Southeast	Post-excavation shot of (003) showing (014)
E2993:078	South	Post-excavation shot of (003) showing (014)
E2993:079	East	Post-excavation shot of (003) showing (014)
E2993:080	East	Post-excavation shot of (003) showing (014)
E2993:081	Southeast	Post-excavation shot of (014)
E2993:082	South	Working shot
E2993:083	Northeast	Working shot, post-excavation of site
E2993:084	Northeast	Working shot post-excavation of site
E2993:085	Northeast	Working shot post-excavation of site
E2993:086	Northeast	Working shot post-excavation of site
E2993:087	Northeast	Working shot post-excavation of site
E2993:088	North	Post-excavation shot of site
E2993:089	North	Post-excavation shot of site
E2993:090	Northeast	Post-excavation shot of site
E2993:091	Northeast	Post-excavation shot of site
E2993:092	Southwest	Post-excavation shot of site

Photo Number	Direction facing	Description
E2993:093	Northeast	Post-excavation shot of site
E2993:094	Southeast	Post-excavation shot of site
E2993:095	Southeast	Post-excavation shot of site
E2993:096	Southeast	Post-excavation shot of site
E2993:097	South	Post-excavation shot of site

Appendix 5 – Drawing Register for Site E2993

Drawing No.	Type	Scale	Description
001	Plan	1:50	Pre-excavation plan of site
002	Section	1:10	Northeast facing section of burnt spread
003	Section	1:10	Northwest section of burnt spread (007)
004	Section	1:10	Southwest facing section of (011)
005	Section	1:10	Northeast facing section of burnt spread, (013)
006	Plan	1:20	Mid-excavation plan of (003) and (014)
007	Section	1:10	South facing section of (003) and (014)
008	Plan	1:50	Mid-excavation plan of site
009	Section	1:10	West facing section of (022)
010	Section	1:10	East facing section of (025)
011	Plan	1:20	Post-excavation plan of site

Appendix 6 – Site Matrix for Site E2993



(008) = 2200 - 1980 cal BC (2 σ)(SUERC – 25454)

Appendix 7 – Palaeoenvironmental samples assessment for E2993
By: Davie Masson and Scott Timpany

Introduction

Nine environmental samples were taken during the excavation of Site E2993 in the townland of Gallowshill, Co. Kildare, a site consisting of a trough, burnt spread, drain, and linear furrows. All of the samples were processed in order to retrieve any palaeoenvironmental material that may aid in the interpretation of the site.

Methodology

Samples of approximately 10 L were taken on site under the direction of an environmental archaeologist. Samples were processed in laboratory conditions using a standard flotation method (cf. Kenward *et al.*, 1980). This was then sorted by eye and any material of archaeological significance removed. All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers *et al.* (2006).

Radiocarbon dating was undertaken at Scottish Universities Environmental Research Centre (SUERC), after Reimer *et al* (2004). Calibrated age ranges were calculated using radiocarbon calibration program CALIB REV5.0.2. All results quoted in the text are taken from the 2 σ calibrated age range

Results

The results are summarised below in Table 1 (Radiocarbon dating results) Table 2 (Composition of Retents) and Table 3 (Composition of Flots). All plant material was preserved by charring.

Wood charcoal
Charcoal fragments were the only plant remains recovered and are present in all samples, with quantities varying from rare to abundant (see Tables 2 and 3). Charcoal fragments recovered from the samples were generally small in size (<1cm). However, two samples (002 and 008) that contained fragments between 1-2 cm therefore suitable for identification and AMS radiocarbon dating.

Other finds
Land snails were found in all but three of the samples (001, 003 and 006); they are believed to be modern (see Table 3).

Discussion

Trough and burnt mound 2210 – 1940 cal BC
Seven samples (001, 002, 004, 005, 006, 007 and 008) were taken from the trough and burnt spread with all containing charcoal fragments. The largest sized fragments were also recovered from this feature (see above). A charcoal fragment from one of the samples (008) was identified as hazel (*Corylus avellana*) and produced a Late Neolithic/Early Bronze date of 2280–1940 cal BC (2σ) (SUERC-25454; 3695±50 cal BC). Hazel would have been a tree common across Ireland during this period and has been identified at a number of other burnt mound sites (e.g. O'Donnell 2007; Scott 2009). All of

the charcoal found in the samples is likely to have spread from the burning activities associated with the mound. Unfortunately the recovery of only charcoal fragments from this feature provides little other interpretative evidence.

Linear feature and stone drain
Samples were also taken from the linear ditch (007) and stone-lined drain (014); Samples 003 and 009 respectively. Both of these samples were found to contain only small-sized charcoal fragments (<1 cm, see Tables 2 and 3). These features were found to cut through burnt mound deposits and it is likely that the charcoal they contain has been re-worked out of these earlier contexts.

Conclusions

- Only charcoal fragments were recovered from the samples, which are all likely to have originated from the burnt mound activity.
- The identification of one charcoal fragment suggests hazel trees were utilised as a fuel resource.

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E-Number	Lab code	Sample ID	Material	δ13C	Radiocarbon age BP	Calibrated Age Ranges (1 σ)	Relative probability	Calibrated Age Ranges (2 σ)	Relative probability
E2993	SUERC-25454	sample 8, context 19	Hazelnut charcoal	-25.6	3695±50	2150-2020 cal BC	60.6	2280-1940 cal BC	94.3

Table 1 – Radiocarbon dating results

Context number	Sample number	Retent vol (L)	Context/ Sample description	Wood charcoal		Comments
				Qty	AMS	
5	1	0.1	Charcoal lens	+++		30% Charcoal
8	2	0.1	Charcoal lens	++		
9	3	0.8	Charcoal Deposit	+++		
15	4	0.1	Top fill of [3]	++		
16	5	0.2	Orange brown fill of [3]	++		
18	6	0.01	Grey peaty fill of [3]	+++		
17	7	0.2	Charcoal rich burnt stone deposit of [3]	+		
19	8	0.3	Base fill with charcoal flecks of [3]	+		Whole Retent Bagged- 90% Quartz
20	9	0.1	Top fill of [4]	+		

Table 2 – Composition of retents

Context number	Sample number	Total flot Vol (ml)	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS	Comments
3	1	15	+++	1.5	Charcoal +	
8	2	10	++	<1		Land snails present
9	3	7				Archaeologically sterile
15	4	10				Land snails present
16	5	25				Land snails present
17	7	10				Land snails present
18	6	5				Archaeologically sterile
19	8	20	++++	2	Charcoal +	Land snails present
20	9	15	+	<1		Land snails present
Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant **NB** charcoal over 1cm is suitable for identification and AMS dating						

Table 3 – Composition of flots

Appendix 8 – Radiocarbon dates and certificates

E-Number	Lab code	Sample ID	Material	δ13C	Radiocarbon age BP	Calibrated Age Ranges (1 σ)	Relative probability	Calibrated Age Ranges (2 σ)	Relative probability
E2993	SUERC – 25454	context 019 , sample 008	Hazel charcoal	-25.6	3695+/-50	2200 – 2170 cal BC	5.4	2280 – 2250 cal BC	1.1
						2150 – 2020 cal BC	60.6	2210 – 1940 cal BC	94.3
						1990 – 1980 cal BC	2.1		

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RADIOCARBON DATING CERTIFICATE

2 October 2009

Laboratory Code SUERC-25454 (GU-19316)

Submitter Karen Stewart
Headland Archaeology (Ireland) Ltd.
Unit 1 Wallingstown Business Park
Little Island
Co. Cork, Ireland.

Site Reference KCK06 E2993
Context Reference 19
Sample Reference 8

Material charcoal : hazel

$\delta^{13}C$ relative to VPDB -25.6 ‰

Radiocarbon Age BP 3695 ± 50

N.B.

1. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

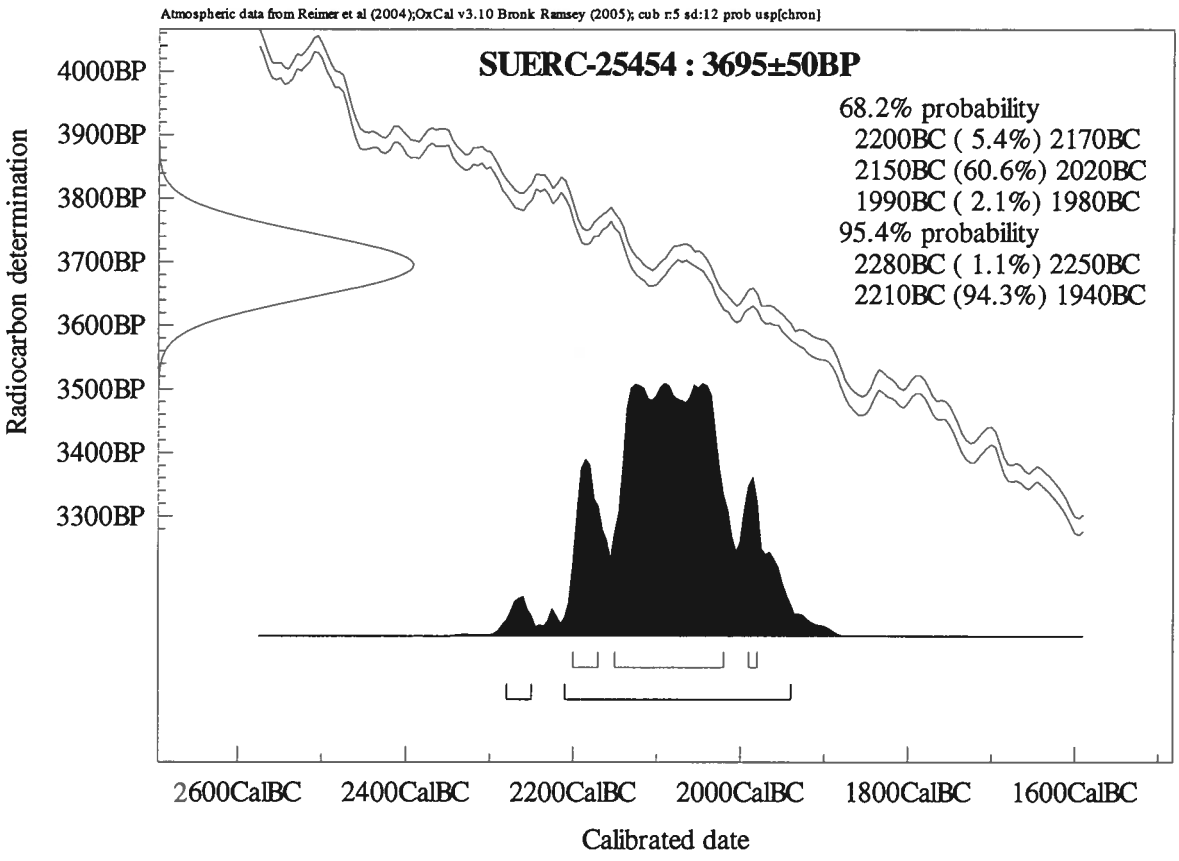
2. The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal3).

3. Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- P. Naysmith Date :- 2/10/09

Checked and signed off by :- E. Dunbar Date :- 02/10/09

Calibration Plot



Appendix 9 – Report on Ferrous Artefact from Site E2993 at Gallowshill Townland, Co. Kildare
By: Miriam Carroll and Annette Quinn, Tobar Archaeological Services

Introduction

Nine fragments of metal sheeting (E2993:021:001) came from the fill of a drain (014) at site E2993, Gallowshill, Co. Kildare. The drain cut through the fills of the trough (003) and is thought to be relatively modern in date. The item is listed below under miscellaneous as it is incomplete and could not be readily assigned a definite classification.

Miscellaneous

Nine fragments of a corroded item (E2993:021:001) were recovered from a fill of a drain (014). The fragments are comprised of thin metal sheeting which has an iron component. Due to the fragmentary nature of the object however it cannot be further classified. A full length or width of the object could not be ascertained therefore the catalogue contains an average thickness of the pieces and a total weight.

Miscellaneous. E2993:021:001. *Fe*.? Th. 1.5 mm (avg.), Wt. 43.3 g. Incomplete. Corroded and fragmented metal sheeting. Undiagnostic, modern in appearance.