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NRA An tÚdarás um Bóithre Náisiúnta National Roads Authority Archaeology

Date: January 2010
Client: Kildare County Council
Project code: KCK06

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 E2872, in the townland of Ballymount, Co. Kildare.

By: John Twomey
National Monuments Section Registration Number: E2872
Director: Gillian Mc Carthy
NGR: 281508/200968

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, E2872, was allocated by the Department for the excavation of the present site in Ballymount townland under the directorship of Gillian Mc Carthy 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 IAC Ltd for the N9/N10 Kilcullen to Waterford Scheme: Kilcullen to Powerstown. Archaeological Services Contract No. 1 – Test Excavations, Kilcullen to Mullamast under Ministerial Direction Number A021/085 on this site between 8 May and 28 August 2006 identified a burnt mound of dark brown/black peaty sandy clay of loose compaction which contained frequent inclusions of angular heat affected sandstone.

Full archaeological resolution was conducted on this site between 19 July and 31 July 2007. The burnt mound identified during testing was re-identified along with a trough with twenty-three stakeholes, a possible trough, four pits, five postholes, eight isolated stakeholes, a cluster of possible stakeholes, and two ditches. A number of flint and chert artefacts were recovered during the excavation. 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 E2872.

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 E2872 was situated in the townland of Ballymount, parish of Usk, barony of Narragh and Reban East, and was located 9 km south of Kilcullen, Co. Kildare at National Grid Reference: 281508/200968 (Figure 1). The site was located on the western slope of a gravel ridge which extended in a north/south direction on the eastern edge of Narraghmore bog. The site lay to the west of the current N9.

One RMP is recorded within the townland of Ballymount, an enclosure (RMP KD032-052) located 900 m northeast of the site. Other known archaeological sites in the vicinity of E2872 include a ringfort (RMP KD032-032) 600 m to the south, a towerhouse (RMP KD032-033) 1.10 km to the south, a church (RMP KD032-031) and graveyard (RMP KD032-031001) 850 m to the south, and an enclosure (RMP KD032-034) 1.45 km to the southwest (Figure 2).

Archaeological investigations undertaken as part of Archaeological Services Contract No. 5 on the road scheme identified a number of burnt mounds and associated features in the landscape surrounding E2872: Ballymount E2874, a Bronze Age burnt mound and associated features, and stone structure (Hanbidge 2010, 200 m to the northeast; Kilgowen E2886, a Bronze Age burnt mound and associated features (Hackett 2009), 3.40 km to the northeast; Inchaquire E2869, a Bronze Age burnt mound and associated features, and metalled surface (Hanbidge 2009b),1.80 km to the southwest; Inchaquire E2867, a Bronze Age burnt mound and associated features, and cist burial (Hanbidge 2009), 2.50 km to the southwest; and Boleybeg E2855, an Iron Age/ Early Medieval burnt mound and associated features (Clark 2009), 4.50 km to the southwest.

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 900 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.

Environmental samples, including charred/waterlogged wood and animal bone samples, were taken on 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. Artefacts recovered during the excavation were assigned unique numbers and treated in accordance with National Museum of Ireland guidelines.

Full archaeological resolution was conducted on this site between 19 July and 31 July 2007. The crew on site E2872 consisted of 1 director, 1 supervisor and 7 site assistants.

Following excavation, artefacts and worked waterlogged/charred wood 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, a burnt mound and its associated features, as well as four spreads, three pits, two postholes, a cluster of stakeholes, and a number of isolated features were revealed. The mound was overlying a trough with twenty-three stakeholes, a second trough, three pits, and two isolated stakeholes.

Phase 1 – Troughs, stakeholes, pits and burnt mound
Troughs and associated features: A large trough (014) (Figure 5, Plates, 2-3) was identified towards the centre of the site. It had a sub-circular shape in plan with vertical sides and a flat base; it measured 1.90 m long, 1.80 m wide and 0.51 m deep. Fifteen stakeholes truncated the base of this trough. Eleven of these stakeholes were cut vertically into the natural ((139), (145), (147), (152), (155), (160), (162), (164), (166), (172) and (174)), while the remaining four ((141), (157), (159) and (169)) were cut at an angle into the sides of the feature. For ease of reading the description of these stakeholes and their fills has been entered into a table (see Table 1).

Context No.	Description	Length (m)	Width (m)	Depth (m)	Fill No.	Description
(139)	Sub-circular cut with vertical sides and a flat base.	0.03	0.03	0.10	(140)	Mid-greyish brown loose silty sand.
(141)	Sub-circular cut with sloping sides and a flat base.	0.08	0.08	0.18	(142)	Light yellowish grey loose silty sand.
(145)	Sub-circular cut with vertical sides and a flat base.	0.04	0.03	0.17	(146)	Mid-brownish grey loose sandy clay.
(147)	Sub-circular cut with vertical sides and a tapered pointed base.	0.04	0.04	0.18	(148)	Greyish brown loose silty sand.
(152)	Sub-circular cut with vertical sides and a flat base.	0.05	0.04	0.27	(153)	Mid-greyish brown loose silty sand.
(155)	Sub-circular cut with vertical sides and a tapered pointed base.	0.04	0.04	0.10	(154)	Dark greyish brown loose clayey sand.
(157)	Sub-circular cut with sloping sides and a tapered pointed base.	0.04	0.04	0.14	(156)	Mid-orangey brown loose silty clay.
(159)	sub-circular cut with sloping sides and a tapered pointed base	0.04	0.04	0.14	(158)	mid-brownish grey loose silty clay
(160)	Sub-circular cut with vertical sides and a flat base.	0.04	0.04	0.14	(161)	Mid-greyish brown loose silty sand.
(162)	Sub-circular cut with vertical sides and a flat base.	0.05	0.04	0.18	(163)	Mid-greyish brown loose silty clay.
(164)	Sub-circular cut with vertical sides and a tapered pointed base.	0.06	0.05	0.28	(165)	Mid-greyish brown loose silty clay.
(166)	Sub-circular cut with vertical sides and a flat base.	0.05	0.04	0.25	(167)	Dark greyish brown loose silty clay.
(169)	Sub-circular cut with sloping sides and a tapered pointed base.	0.03	0.03	0.18	(168)	mid-brownish grey loose silty clay

Context No.	Description	Length (m)	Width (m)	Depth (m)	Fill No.	Description
(172)	Sub-circular cut with vertical sides and a flat base.	0.05	0.04	0.14	(173)	Light brownish grey loose silty clay.
(174)	Sub-circular cut with vertical sides and a flat base.	0.05	0.05	0.14	(175)	Light brownish grey loose silty clay.

Table 1 – Description of stakeholes within trough (014).

Overlying these features was basal fill (004). This consisted of a firmly compacted dark greyish black clayey silt with a high content of heat shattered stones and charcoal. It had a length of (1.90 m, a width of 1.80 m, and a depth of 0.45 m. A slump deposit of dark brownish black loose peat with inclusions of charcoal and small pebbles (013) was located against the eastern edge of the trough above (004). It measured 1.07 m long, 0.10 m wide and 0.42 m deep. Sealing these deposits was a fill of firmly compacted dark greyish black clayey silt (005) which formed part of the overlying burnt mound. This deposit contained heat-affected stones, charcoal and wood inclusions along with a single pig bone (Appendix 9) and seemed to have slumped into the trough after the feature had gone out of use.

Eight stakeholes were also located directly to the southeast of the trough cut and are presumed to be contemporaneous (Figure 5, Plate 3). These features possibly represented the remains of some form of windbreak or acted as additional support for the trough-lining (see Table 2).

Context No.	Description	Length (m)	Width (m)	Depth (m)	Fill No.	Description
(125)	Sub-circular cut with vertical sides and a tapered pointed base.	0.10	0.10	0.38	(126)	Mid-brownish grey loose silty clay.
(127)	Sub-circular cut with vertical sides and a tapered pointed base.	0.05	0.05	0.08	(128)	Mid-brownish grey loose silty sand.
(129)	Sub-circular cut with vertical sides and a flat base.	0.04	0.04	0.10	(130)	Mid-brownish grey loose silty clay.
(131)	Sub-circular cut with vertical sides and a flat base.	0.06	0.06	0.27	(132)	Mid-brownish grey loose silty sand.
(133)	Sub-circular cut with vertical sides.	0.08	0.06	0.25	(134)	Dark brownish grey loose silty sand.
(135)	Sub-circular cut with vertical sides and a flat base.	0.04	0.03	0.09	(136)	Mid-greyish brown loose silty sand.
(137)	Sub-circular cut with vertical sides and a tapered pointed base.	0.05	0.05	0.1	(138)	Dark brownish grey loose silty sand.
(143)	Sub-circular cut with vertical sides and a flat base.	0.11	0.1	0.59	(144)	Dark brownish grey loose silty sand.

Table 2 – Description of stakeholes southeast of trough (014).

A second trough (049) was situated approximately 3.80 m to the north of (014) (Figure 6). It measured 2.03 m long, 1.20 m wide, 0.42 m deep, and had a sub-oval shape in plan, gradual breaks of slope at the top and bottom, rounded sides and a concave base. Its basal fill consisted of loosely compacted mid-brownish grey silty clay (071) which contained occasional medium angular stones and frequent charcoal inclusions; this was the main fill of trough (049) and measured 0.31 m in depth. Overlying

this was a firmly compacted mid-orangey brown sandy silt (017) which contained three cattle bones (Appendix 9) and firmly compacted dark greyish black clayey silt (004) which contained inclusions of heat affected stones, charcoal, wood and one fragment of flint debitage (E2872:004:001). These deposits formed part of the burnt mount spread which was situated directly above this feature and it is likely that they slumped into the cut after (049) went out of use.

Pits: Approximately 3.60 m to the southwest of trough (049) was sub-circular pit (048). This measured 1.00 m long, 0.80 m wide, 0.31 m deep, and had gradual breaks of slope, concave sides and a tapered pointed base. It contained a single fill of loosely compacted mid-greyish brown silty clay (047) with inclusions of unidentified animal bone (Appendix 9) and fragments of wood.

Sub-circular pit (039) was situated 3.20 m to the south of the burnt mound. It had concave sides and a flat base and measured 1.33 m long, 1.20 m wide and 0.35 m deep. It contained a single fill which was composed of burnt stone and charcoal, possibly from the burnt mound, in a matrix of compact dark greyish black clayey silt (176). It is possible that this pit served as some form of 'pot boiler'.

Pit (032) was located 2.80 m west of trough (014) and had a sub-oval shape in plan with steep, concave sides and a rounded base. It measured 1.38 m long, 0.64 m wide and 0.92 m deep and was located 0.60 m to the southwest of (048). It contained two fills; the basal fill consisted of mid-greyish brown loose peat (037) with inclusions of charcoal and the upper fill consisted of mid-greyish yellow loose silty clay (038) with inclusions of wood (Appendix 8), cattle and pig bone (Appendix 9), and pebbles. Radiocarbon dating of hazel charcoal from this deposit returned a date of 2860 – 2490 cal BC (2 σ) (SUERC-27197) placing this feature in the Late Neolithic Age (Appendix 10).

Burnt mound (Figure 3, Plate 1). The main feature of archaeological interest on this site was a large kidney-shaped burnt mound which was situated on a steep incline, sloping upwards from west to east. It measured 14.75 m north/south, 12.70 m east/west and 1 m in depth and was composed of numerous spreads and deposits. It sealed all the features mentioned above except for pit (039).

The basal layers consisted of a loosely compacted light yellowish grey sandy silt (050), which measured 8.60 m north/south, 4 m east/west and 0.10 m deep, and a loosely compacted dark orangey brown sandy silt (053). Overlying these deposits were a layer of firmly compacted mid-orangey brown sandy silt (017), which was located at the western edge of the spread, and a loosely compacted dark reddish brown loose sandy silt (052) which contained root inclusions. The main fill of the burnt mound was the largest deposit (004). This measured 16 m in length, 9 m in width and 0.90 m in depth, and consisted of firmly compacted dark greyish black clayey silt with inclusions of heat affected stones, charcoal, wood, a single cattle bone and a single rabbit bone which is a later intrusion (Appendix 9), and a fragment of flint debitage (E2872:004:001) (Appendix 11). Overlying this deposit was loosely compacted dark blackish brown peat (005) which contained charcoal and stone inclusions and a single pig bone (Appendix 9). The upper deposits consisted of firmly compacted light grey silty clay (054), and loosely compacted light yellowish grey silty sand (059). Deposit (054) was situated at the eastern edge of the burnt mound and measured 1.10 m diameter and 0.20 m in depth; it contained pebble inclusions. The deposit (059) was situated in the southern part of the burnt mound and measured 1.30 m diameter and 0.20 m in depth. Deposit (003) was also partially covered a subsoil spread consisting of loosely compacted mid-brown sandy silt (003) measuring 0.70 m long by 0.50 m wide and a depth of 0.17 m.

Other features: A large number of features: pits, postholes, stakeholes, spreads, and ditches were situated beyond the extent of the burnt spread with the main concentration being to its southwest.

Pits: Pit (149) was situated 5.60 m to the northwest of the burnt mound. It had a sub-oval in shape plan with stepped to rounded sides and a rounded base, and it measured 3.20 m long, 0.80 m wide and 0.20 m deep. Its basal fill consisted of light pinkish brown loose peat (150) which measured 0.05 m in depth and contained inclusions of wood and charcoal. The upper fill (151) consisted of dark blackish brown spongy peat with inclusions of wood and measured 0.27 m in depth.

Pit (036) (Plate 4) was circular in plan with concave sides and an irregular and stony base. It was situated 6.50 m to the south of the burnt mound and measured 0.98 m long, 0.90 m wide and 0.29 m deep. Its basal fill (035) consisted of a deliberately placed stones which seemed to line the cut. These were overlaid by loosely compacted mid-reddish brown silty clay (034) which measured 0.13 m deep and contained twenty one cattle bones, two bones of a large mammal, and thirty one unidentified bones (Appendix 9). The upper fill (033) consisted of firmly compacted light yellowish brown clayey silt and measured 0.14 m in depth.

Pit (043) measured 0.80 m in width; the full extent of this feature could not be obtained as it extended beyond the limit of excavation to the south (Figure 3). It was located 1.60 m to the southwest of (036) and had a sub-oval shape in plan with vertical sides and an uneven base. It was filled by a loosely compacted silt (046) and contained a single piece of worked chert (E2872:046:001) (Appendix 11).

Pit (063) was situated 1.15 m to the northwest of (043). It had a slightly irregular, sub-oval shaped cut with vertical sides and an uneven base and it measured 1.20 m long, 0.76 m wide and 0.18 m deep. Its basal fill consisted of loosely dark brownish grey sandy silt (064) which contained frequent charcoal inclusions and measured 0.12 m in depth. The upper fill (065) measured 0.07 m in depth and consisted of loosely compacted mid-orangey grey silty sand with frequent charcoal inclusions.

Postholes: Posthole (030) was situated 5.20 m to the north of the burnt mound. It measured 0.52 m long and 0.49 m wide and had a sub-circular shape in plan with gradually sloping sides and a rounded base. It contained a single fill which consisted of loosely compacted dark brown sand (031) with inclusions of charcoal. Although it had a regular shape, this feature had been heavily truncated by later agricultural activity, and measured 0.09 m in depth.

Located 1 m southwest of the burnt spread was a small circular posthole (100) with concave sides and a concave base. It measured 0.28 m in diameter and 0.15 m deep. It contained a single fill of loosely compacted mid-blackish brown sandy silt (101) with inclusions of roots.

Sub-circular posthole (044) measured 0.43 m long, 0.4 m wide and 0.45 m deep and was located 7.50 m to the south of (100). It had vertical sides and a rounded pointed base and was filled by a loosely compacted dark reddish brown clayey sandy silt (045) with inclusions of small roots.

Stakeholes

A number of isolated stakeholes were identified throughout the site (Figure 3). For ease of reading the description of these features and their fills has been entered into a table (see Table 3).

Context No.	Description	Length (m)	Width (m)	Depth (m)	Fill No.	Description
(057)	Sub-circular in plan with sharp breaks of slope, concave sides and a concave base.	0.12	0.11	0.16	(058)	Mid-reddish brown loose clayey sand with inclusions of charcoal.
(068)	Sub-circular in plan with sharp breaks of slope, vertical sides and a rounded base.	0.06	0.04	0.36	(069)	Light reddish brown loose sandy silt with inclusions of charcoal.
(070)	Sub-oval in plan with sharp breaks of slope, vertical sides and a rounded base.	0.08	0.07	0.21	(095)	Loose sandy clay.
(073)	Sub-circular in plan with sharp breaks of slope, vertical sides and a flat base.	0.10	0.10	0.07	(074)	Mid-reddish brown loose sandy silt.
(079)	Sub-circular in plan with sharp breaks of slope, vertical sides and a rounded base.	0.04	0.04	0.23	(080)	Mid-orangey brown loose sandy silt with inclusions of pebbles and roots.
(085)	Sub-circular in plan with sharp breaks of slope and a rounded base.	0.11	0.1	0.19	(086)	Mid-orangey brown loose clayey silt with inclusions of pebbles and roots.
(170)	Sub-circular in plan with sharp breaks of slope, vertical sides and a tapered rounded base.	0.14	0.08	0.24	(171)	Light yellowish brown loose clayey silt with pebble inclusions. Two fragments of flint (E2872:171:001 and E2872:171:002) were also recovered from this deposit.

Table 3 – Description of isolated stakeholes and their fills

A small cluster of eighteen stakeholes (Figure 3, inset 1) was identified in the southwestern corner of the site (Figure 4). They were all sub-circular in plan with sharp breaks of slope, vertical sides and rounded bases. These features did not seem to form any viable structure and their function is uncertain. For ease of reading the measurements and fill description for these stakeholes has been entered into a table (see Table 4).

Context No.	Length (m)	Width (m)	Depth (m)	Fill No.	Description
(075)	0.04	0.03	0.23	(076)	Loose dark orangey brown clayey silt with pebble inclusions.
(077)	0.05	0.04	0.28	(078)	Loose dark orangey brown clayey silt with pebbles and root inclusions.
(081)	0.05	0.04	0.26	(082)	Loose dark orangey brown clayey silt with pebble inclusions.
(083)	0.06	0.06	0.28	(084)	Loose dark orangey brown clayey silt with pebble inclusions.

Context No.	Length (m)	Width (m)	Depth (m)	Fill No.	Description
(089)	0.08	0.06	0.15	(090)	Loose dark orangey brown clayey silt with pebbles and root inclusions.
(091)	0.02	0.01	0.20	(092)	Loose dark orangey brown clayey silt with pebbles and root inclusions.
(093)	0.06	0.04	0.33	(094)	Loose dark orangey brown clayey silt with pebbles and root inclusions.
(103)	0.12	0.10	0.53	(104)	Loose dark orangey brown clayey silt with root inclusions.
(105)	0.07	0.05	0.32	(106)	Loose dark orangey brown clayey silt with root inclusions.
(107)	0.06	0.04	0.42	(108)	Loose dark orangey brown clayey silt with root inclusions.
(109)	0.12	0.10	0.56	(110)	Loose dark orangey brown clayey silt with root inclusions.
(111)	0.04	0.03	0.21	(112)	Loose dark orangey brown clayey silt.
(113)	0.08	0.06	0.21	(114)	Loose dark orangey brown clayey silt with root inclusions.
(115)	0.14	0.12	0.62	(116)	Loose dark orangey brown clayey silt with root inclusions.
(117)	0.07	0.05	0.23	(118)	Loose dark orangey brown clayey silt with root inclusions.
(119)	0.05	0.05	0.32	(120)	Loose dark orangey brown clayey silt with root inclusions.
(121)	0.11	0.10	0.36	(122)	Loose dark orangey brown clayey silt with root inclusions.
(123)	0.04	0.04	0.29	(124)	Loose dark orangey brown clayey silt with pebbles and root inclusions.

Table 4 – Measurements and description of fills for cluster of stakeholes in the southwestern corner of site.

Spreads: A number of spreads were situated in the area of the site south of the burnt mound. Spread (056) consisted of loosely compacted dark reddish brown sandy clayey silt which contained inclusions of stones and a single cattle bone. It measured 1.04 m long, 0.60 m wide and 0.09 m deep, and was located 2.20 m to the southwest of the burnt mound. A flake of flint debitage (E2872:056:001) was recovered from spread (056). This deposit was very similar to spread (055), which was situated 0.80 m to the southeast of (056). It consisted of loosely compacted dark orangey brown clayey silty peat with inclusions of small stones, charcoal, wood and a piece of animal bone with cut marks. It measured 3.60 m long, 1.20 m wide and 0.17 m deep.

Spread (066) measured 1.20 m wide and over 1.70 m long, however its full length could not be determined as it extended beyond the limit of excavation to the south. It consisted of loosely compacted mid-reddish brown clayey silt and was located 5 m southwest of spread (055). One distally retouched flint flake (E2872:066:001) was recovered from this deposit. Two possible postholes were found to truncate (066). The northernmost feature was (098), which measured 0.12 m deep, 0.40 m wide and 0.42 m long and was sub-circular in plan with sharp breaks of slope, vertical sides and a tapered pointed base. It was filled by loosely compacted blackish brown peat (099) with inclusions of small roots. To the south it was truncated by feature (096), which had a sub-circular shape in plan with gradual breaks of slope, concave sides and a blunt base. It measured 0.12 m deep, 0.51 m wide

and 0.53 m long and was filled by a loosely compacted black brownish orange peat (057) with inclusions of small roots.

Post-medieval linear features: Two post-medieval linear features were identified on site E2872. It is likely that these features were directly related with agricultural practices, namely field drainage and ploughing, and they were therefore deemed to be of little archaeological significance.

Linear ditch (012) ran in a northeast/southwest direction across the length of the site. Within this site the ditch (012) measured 33.30 m long, its maximum width was 1.10 m and it measured 0.44 m in depth. Its basal fill consisted of a loosely compacted mid-orangey brown sandy clay (102). This contained root and stone inclusions and a single utilised flint flake (E2872:102:001). Overlying this was a loosely compacted dark brown soil (010).

Linear furrow (060) ran perpendicular to ditch (012) and measured 4.55 m in length, 0.68 m in width and 0.13 m deep. It was filled by a single fill of loosely dark orangey brown clayey silt (061) with inclusions of pebbles.

5 Discussion

The results of the excavation at Ballymount 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, three defined phases of activity were identified. Phase I related to the burnt mound and its associated features. Radiocarbon dating results from pit (032) show this phase relates to the Late Neolithic Age, returning a date of 2860 - 2490 cal BC (2σ) (SUERC-27197). Phase II to the pits and spreads located to the south of the burnt mound and the stakeholes both isolated, and in clusters across the site, while Phase III consisted of post medieval agricultural features.

Phase I: The shallow burnt mound and the presence of two troughs (014), (049), indicate that this site, E2872, represents the remains of a *fulacht fiadh*. The burnt and heat-shattered stone within a charcoal rich silty matrix is 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: Due to the unsuitability of the samples retrieved, and the lack of any artefacts uncovered from the features, no further information can be extrapolated from either the undefinable cluster of stakeholes in the southwest of the site (Table 4), or the isolated stakeholes spread around the site (Table 3). This is also the case for the pits and spreads situated to the south of the burnt mound. They may represent activities taking place in the environs of the burnt mound, but no concrete evidence exists to substantiate this possibility or to establish a relationship between these features and the burnt mound. The spreads (055), (056), (066) are positioned at the base of a slope and probably represent hill wash rather than any deliberate spreading of the deposits. Thus the flint and chert recovered from these, (E2872:056:001) and (E2872:066:001), are likely to represent secondary deposits of these artefacts. However, these features are still potentially prehistoric in date.

Phase III: Linear ditch (012) was also identified on three other excavated sites in this area. It started/ended at site E2871 to the south (Hanbidge 2009a) and cut through this site (E2872), sites E2873 (Hanbidge 2009b) and E2874 (Hanbidge 2010) to the north. Its presence is recorded on both the 1st Edition 6" Ordnance Survey maps no. KE032/WW014 (1839), and the 2nd Edition 6" Ordnance Survey map no. KE032-07 (1909). It represents a post-medieval field boundary which was removed during the course of the twentieth century in the consolidation of agricultural fields. Such a process occurred in this region in the latter half of the nineteenth, and early twentieth centuries. The shallow nature of the feature (060) and it linear orientation reinforces the validity of its interpretation a furrow, and adds to the evidence of post-medieval agricultural activities.

Dating evidence: While the agricultural features associated with Phase III can clearly be placed in the post-medieval period, dating the activities associated with Phases I and II relies on an evaluation of the artefact assemblage and the radiocarbon date obtained from context (032). The lithic material recovered from Phase I and II features is certainly prehistoric in date and appears to be typical of Late Neolithic/Early Bronze Age material (Appendix 11). Supporting this, the radiocarbon determination returned from hazel charcoal in context (032) produced a date range of 2860 - 2490 cal BC (2σ) (SUERC - 27197). This is comparatively early in relation to the dates obtained from other burnt mound sites excavated nearby as part to the N9/N10 scheme (see Table 5).

NMSR No.	**Calibrated Age Ranges (2 σ)**	**Dating Framework**	**Reference**
E2867	1690 - 1430 cal BC	Early-Middle Bronze Age	Hanbidge (2009a)
E2869	2140 – 1880 cal BC	Early Bronze Age	Hanbidge (2009b)
E2871	2470 – 2140 cal BC	Early Bronze Age	Hanbidge (2009c)
E2874	1130 – 810 cal BC	Late Bronze Age	Hanbidge (2009d)
E2886	2300 – 1970 cal BC	Early Bronze Age	Hackett (2009b)
E2887	2210 – 1930 cal BC	Early Bronze Age	O'Connell (2010a)
E2888	2350 – 2030 cal BC	Early Bronze Age	O'Connell (2010b)

Table 5: Radiocarbon dates from burnt mounds excavated in the vicinity of E2872

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, 1989-90). Many contemporaneous sites have been identified and recorded in the archaeological inventory for County Kildare and a number in the landscape surrounding Ballymount. 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. Areas suitable for *fulachta fiadh* often see a multitude of the features clustered across a locality. 'The sites are frequently found together in groups … along the banks of a stream or in a marshy area within a few metres of each other' (O Drisceoil 1988). The discovery during excavation of three other *fulachta fiadh* within a 200 m radius of E2872: E2871 (Hanbidge 2009a), E2873 (Hanbidge 2009b) and E2874 (Hanbidge 2010) emphasizes this point. This *fulacht fiadh* displays many of the classic features of such a monument, including several troughs which may have served different functions such as cooking or bathing. The location of the *fulacht fiadh* in an area with a high water table provides the water needed for heating and the burnt stones form a flattened mound above them.

The shape of burnt mounds often varies from the 'classic' crescent/kidney shape to completely irregular. Often it depends on the features underneath as the debris from the burning process would initially be dumped away from the features. At Ballymount the trough (014) was the most centrally located feature under the burnt mound, and the absence of burnt mound material to its east would suggest that as the mound grew following various episodes of use, it continued to be reused and accessed from this direction. This would suggest that it may have been the primary trough on the site, as the mound would usually form up as an arc or crescent to one side of the main trough or pit. In the case of this particular mound, its position on the side of a steep slope may have encouraged the development of this shape as had material removed from the trough (014) been dumped uphill, residue from this waste may have collapsed back into the emptied trough. The size of a mound is often taken as an indicator of the number of uses or length of occupation. North of trough (014) was a similarly sized trough (049). The use of two troughs is attested to in historical texts, where one feature is used for cooking and the other for bathing (O Drisceoil 1988). Modern farming practises and field clearance often remove all or part of mounds and all that is left is a few burnt stone spreads and a series of pits or troughs.

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. 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 stone 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.

Troughs were often, though not always, lined with some impervious material such as clay, wood, stone or leather. Fifteen stakeholes were uncovered in trough (014), eleven cut vertically into the base, and four more cut into the sides of the feature at an angle. It is likely that these stakeholes represent the traces of a probable timber lining for the trough. The further eight stakeholes lining the southeast edge of the trough most likely represent a windbreak for the trough, or possibly a form of additional support for the trough-lining. At the site of Clashroe in Co. Cork, a partially destroyed wood lined trough was uncovered (Hurley 1987, 97). This trough was constructed utilizing part of a hollowed out tree trunk to form the base and part of the sides of the trough. The remaining end of the trunk had had a groove/slot cut into it so that a plank of wood would be able to be slotted in to the trunk. The other end would presumably have had a similar slot, though that was destroyed by water erosion. Other sites such as Ballyclogh in Co. Cork (Lehane 1988, 85) had troughs constructed out of flat planks which were set into a large pit. The shape of the wooden part of the trough would have been held in place at the corners by stakes. The space between the wooden part of the trough and the pit cut would then be filled by clay and stone packing material. Often the only trace visible of a trough with wooden lining would be a series of stake or postholes visible at the edges of the trough's base. Unlined troughs are known from such sites as Commons, Co. Limerick (Taylor and Bartlett 2002, 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.

Other features are often found associated with burnt mounds such as pits, postholes, stakeholes, track-ways and platforms. The pit (048) was of a size that it was unlikely to have served as a trough. It returned remains of animal bone which may point to its use as a storage/rubbish pit. This bone, as with the rest recovered from *fulacht fiadh* deposits, was unburnt and showed no signs of any butchering activity of consumption. Pits serve a number uses within the context of a burnt stone mound. They can be used as rubbish pits, roasting/cooking pits or wells. At Kilfinning, Co. Limerick

(Dennehy 2002, 325-26), a number of 'pot boilers' were identified beneath a burnt stone mound. These features consist of pits containing burnt stone and their function seemed to be cooking 'hobs' on which ceramic vessels could be placed. The difficulty with these pit types would be to tell them apart from roasting pits found in similar sites such as at Robertstown, Co. Limerick (Dennehy 2002, 343-45). Postholes and stakeholes are often present either in the form of simple structures such as wind breaks or huts or associated with pits and troughs where they are part of a lining or racks close by. A number of fragments of charred, unworked wood, which may represent firewood were recovered from pit (032).

The isolated position of large pit (039), 1.80 meters south of the burnt mound spread raises a number of possibilities. It may be that this trough was indeed related to the burnt mound, and that, when being emptied after use, the heat shattered stones were carried to, and deposited on, the nearby mound. Alternatively, this feature may be entirely independent of the burnt mound. It may instead represent the remains of a pot boiler. Such features were independent troughs which would have been used only occasionally or even for a single episode. Experiments have shown a trough would be filled with stone to about 70% of its capacity to boil a joint of meat in such a feature (Brindley, Lanting and Monk 1989-90).

Burnt mounds: nomenclature

The term *fulacht fiadh* was first used in the 9th century AD in such sources as the various saint's lives and taken to mean the cooking sites which utilised heated stones for cooking. A *fulacht* is defined to as a spit in the Yellow Book of Lecan, however, evidence for a spit would be unlikely to survive (O'Sullivan *et al* 2004). The main physical evidence recovered on the sites are the by-products of the process, consisting mainly of heat-shattered stone and charcoal and commonly a hole in the natural subsoil for obtaining fresh water (*ibid.*). The term *fulacht fiadh* itself is composed of two Irish words. The first means 'recess' or 'cavity' and by extension came to be associated with pits, pits specifically used for cooking, the act of cooking and sometimes even the food itself (Ó Drisceoil 1988, 673; Ó Drisceoil 1990, 158)). The second word has two possible interpretations: *fiadh*, of the deer or of the wild, and *fian*, a roving band of hunters or warriors, occasionally "of the *Fianna* or Fionn Mac Cumhail" in reference to a mystical or pseudohistorical army who hunted and lived outdoors (Ó Drisceoil 1988, 673). Ó Drisceoil (1990, 158) cautions associating every mention of *fulacht* in the literature with the archaeological monument, given the wide range of meanings. In fact given the Bronze Age date range established for the majority of sites there are concerns over the use of the term *fulacht fiadh* to refer to these sites with many scholars favouring the more neutral term 'burnt mound'.

Burnt mounds: 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. Contexts (004) and (005) represent individual tiplines in this particular burnt mound.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 & 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. At Ballymount it may have been available through the high level of the local water table, the northwest corner of the site adjacent to Narraghmore Bog being underwater in mid-Summer.

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.*). At Ballymount, the bone remains retrieved were all unburnt and showed no evidence of either gnawing or butchery.

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 (ed. Ó Cuív 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. Grogan *et al.* 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 (2007, 91). Using digital terrain modelling, they calculated that the average number of uses per site was approximately 250 (*ibid.*). They also noted that spoil was occasionally present on top of earlier mounds indicating that troughs had possibly been repositioned (*ibid.*).

Artefact Assemblage

It is not unusual to recover finds from Irish burnt mounds. Recent excavations in the southeast of Ireland revealed a similar pattern of very small assemblages found in association with *fulachta fiadh*, e.g. the N25 Waterford By-Pass. These assemblages are dominated by the use of beach pebble flint which is often worked using the bipolar method (Hegarty & Long 2005). This site was located in an area of intense prehistoric activity with assemblages being recovered from the adjacent sites E2871, E2873 and E2874. A single artefact of worked chert was retrieved from the pit (043) at the southern extent of the site. Apart from this the rest of the lithic assemblage from E2872 consisted of flint. A worked flint was recovered from the basal fill of the field boundary (012)(E2872:102:001). This evidently was a secondary deposit of the artefact and highlights the presence of flint fragments across

this area. A distally retouched flint flake, which may have been used as a convex scraper was retrieved from the spread (066) situated to the southwest of the burnt mound (E2872:066:001). The remainder of the lithics recovered constitute debitage from knapping. Most of these artefacts were located to the south of the burnt mound and could reflect the presence of a working area or surface extending beyond the site limits (Appendix 11). The lithic material recovered is typical of Late Neolithic/Early Bronze Age material, providing additional support for the radiocarbon dates.

Conclusions
The evidence from the other sites in its vicinity support the notion that site E2872 should not be viewed in isolation but rather as part of a greater archaeological landscape. 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	164
Plans	7
Sections	26
Photographs	140
Registers	5
Notebooks	-

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.

References

Allen, D. 1994 'Hot water and plenty of it', *Archaeology Ireland,* Vol. 8, No. 1, 8-9.

Barfield, L. and M. Hodder 1987 'Burnt mounds as saunas, and the prehistory of bathing', *Antiquity* Vol. 61, 370-79.

Bayley D., Y. Whitty and P. Lynch 2006 *Archaeological Assessment N9/N10 Kilcullen to Waterford Scheme: Kilcullen to Powerstown (A021/090). Archaeological Services Contract 1,Kilcullen to Mullamast*. Unpublished report by Irish Archaeological Consultancy Ltd for Kildare County Council and the National Roads Authority.

Bennett, I. (ed.) 2009 Excavations.ie, database of Irish excavation reports http://www.excavations.ie/Pages/HomePage.php (Last accessed November 17 2009).

Brindley, A. and J. Lanting 1990 'The dating of fulachta fiadh' in Victor Buckley (ed.) *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell, Dublin:.55-56.

Cherry, S. 1990 'The finds from fulachta fiadh', in Victor Buckley (ed.) *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell, Dublin, 49-54.

Clark L. 2009 *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 E2855, in the townland of Boleybeg, Co. Kildare.*Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Gleeson, C. and G. Breen *N25 Waterford Bypass, Contract 3. Final Report on archaeological investigations at Site 40, in the townland of Rathpatrick, Co. Kilkenny*. Unpublished client report.

Grogan, E., O' Donnell, L., Johnston, P. (eds) 2007 *The Bronze Age Landscapes of the Pipeline to the West. Wicklow*. Wordwell, Dublin.

Hackett, L. 2009a *N9/N10 Kilcullen to Waterford Scheme: Kilcullen to Powerstown. Final Report on archaeological investigations at Site E2566 (A021/008), in the townland of Ballyburn Lower, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hackett L. 2009b *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 E2886, in the townland of Kilgowan, Co. Kildare.*Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hanbidge R. 2009a *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 E2867, in the townland of Inchaquire, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hanbidge R. 2009b *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 E2869, in the townland of Inchaquire, Co. Kildare. Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hanbidge R. 2009c *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 E2871, in the townland of Ballymount, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hanbidge R. 2009d *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 E2873, in the townland of Ballymount, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hanbidge R. 2010 *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 E2874, in the townland of Ballymount, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Hurley M. 1987 *A fulacht fiadh at Clashroe, Meelin, Co. Cork*. Cork Historical & Archaeological Society Volume 102.

Lehane D. 1988 Excavations at Ballyclogh, Fermoy, Co. Cork. Cork Historical & Archaeological Society Volume 93.

Margaret Gowen and Co Ltd. 2003 *N7 Nenagh to Limerick High Quality Dual Carraigeway to Motorway Standard Environmental Impact Statement*. Volume 4B, Appendix I.

McClatchie, M., Brewer, A., Dillon, M., Johnston, P., Lyons, S., Monk, M., Stewart K. and Timpany, S. (members of the Irish Archaeobotany Discussion Group). Letter to the Editor 'Brewing and *Fulacht fiadhdh', Archaeology Ireland,* Vol. 23, No. 1, 47.

Monk, M. 2007 'A greasy subject' *Archaeology Ireland*, Vol. 21, No. 1, 22-24.

Moore, D. and Quinn, B. 2007 'Ale, brewing and fulacht fiadhdh', *Archaeology Ireland,* Vol. 21, No. 3, 8-9.

O'Connell, T.J. 2010a *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 E2887, in the townland of Old Kilcullen, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

O'Connell, T.J. 2010b *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 E2888, in the townland of Old Kilcullen, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

O'Drisceoil D. 1988 'Burnt Mounds: cooking or bathing?', *Antiquity* Vol. 62, 671-80.

Ó Drisceoil, D. 1990 'Fulachta fiadh: the value of early Irish literature', in V. Buckley (ed.) *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell, Dublin, 157-164

O'Kelly, M. 1954 'Excavations and experiments in ancient Irish cooking places?' *Journal of the Royal Society of Antiquities of Ireland*, Vol. 95, 105-146.

O'Neill, J. 2000 "Just another *fulacht fia* story", *Archaeology Ireland* Vol. 14, No.2, 19

Ó Néill J. 2003-2004 *Lapidibus in Igne Calefactis Coquebatur: The Historical burnt mound 'tradition'* in The Journal of Irish Archaeology. Volumes XII & XIII.
Tourunen A. and Stewart, K. 2008 *pH analysis of burnt mounds: implications for preservation of organic material.* Poster presented at The World Archaeological Congress, Dublin, Ireland.

O'Sullivan, M and Downey, L. 2004 'Knowing your Monuments: Fulachta Fiadh' in *Archaeology Ireland* No.66, Spring.

Taylor K and Bartlett T. in Bennett I (Ed). 2002 *Excavations 2002. Summary accounts of archaeological excavations in Ireland.* Wordwell.

Twomey J. 2009 *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 E2872, in the townland of Ballymount, Co. Kildare.* Unpublished report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Valerie J. Keeley Ltd 2003 'Architectural, Archaeological and Cultural Heritage', in Roughan and O'Donovan – Farber Maunsell Alliance (compilers) *N9/N10 Kilcullen to Waterford Scheme: Kilcullen to Powerstown: Environmental Impact Statement Vol. 1.* 10/1 – 10/154. Published report for Kildare County Council and the National Roads Authority.

Waddell, J. 2000 *The prehistoric archaeology of Ireland*. Wordwell, Wicklow.

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- Graphics department, Headland Archaeology (Ireland) Ltd.
- Jessica Djohari, Site Supervisor, Headland Archaeology (Ireland) Ltd.
- The excavation team.

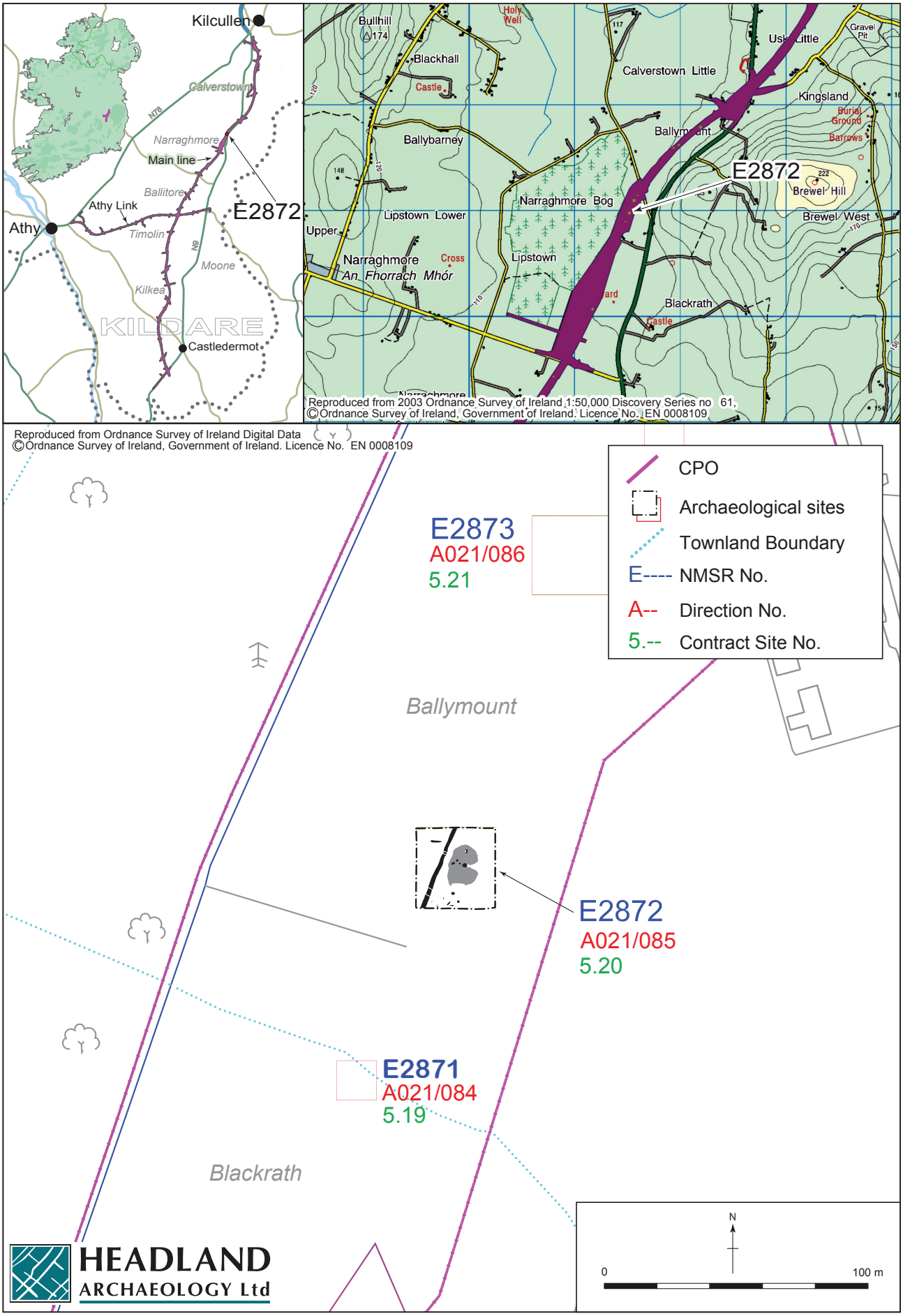


Figure 1 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 – Resolution, Kilcullen to Moone and Athy Link Road: E2872 site location.

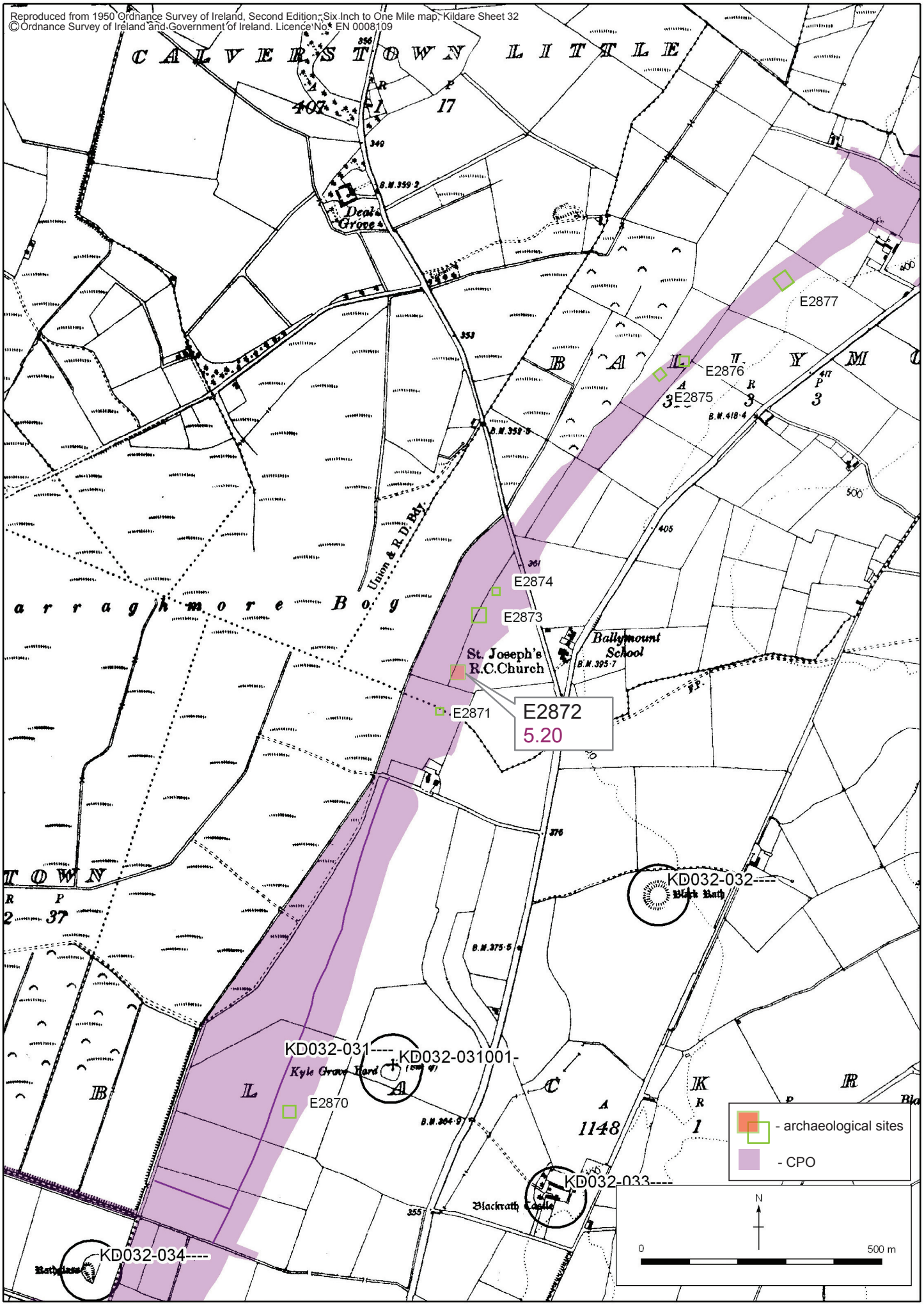


Figure 2 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 – Resolution, Kilcullen to Moone and Athy Link Road: E2872 extract from RMP.

Figure 3 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Killcullen to Moone and Athy Link Road: E2872 site layout.

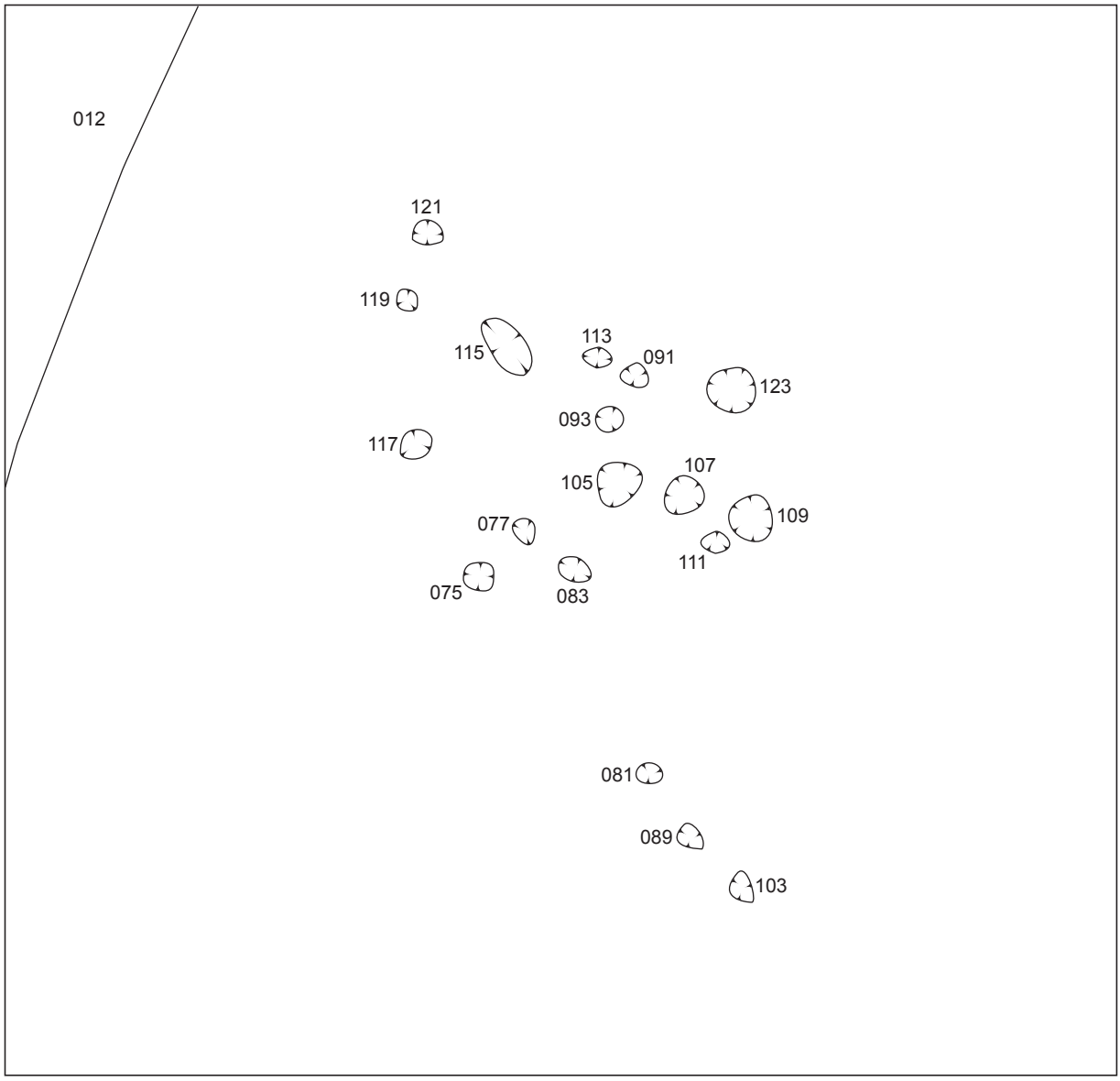


Figure 4 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Killcullen to Moone and Athy Link Road: E2872 detail of features in southwest of site.

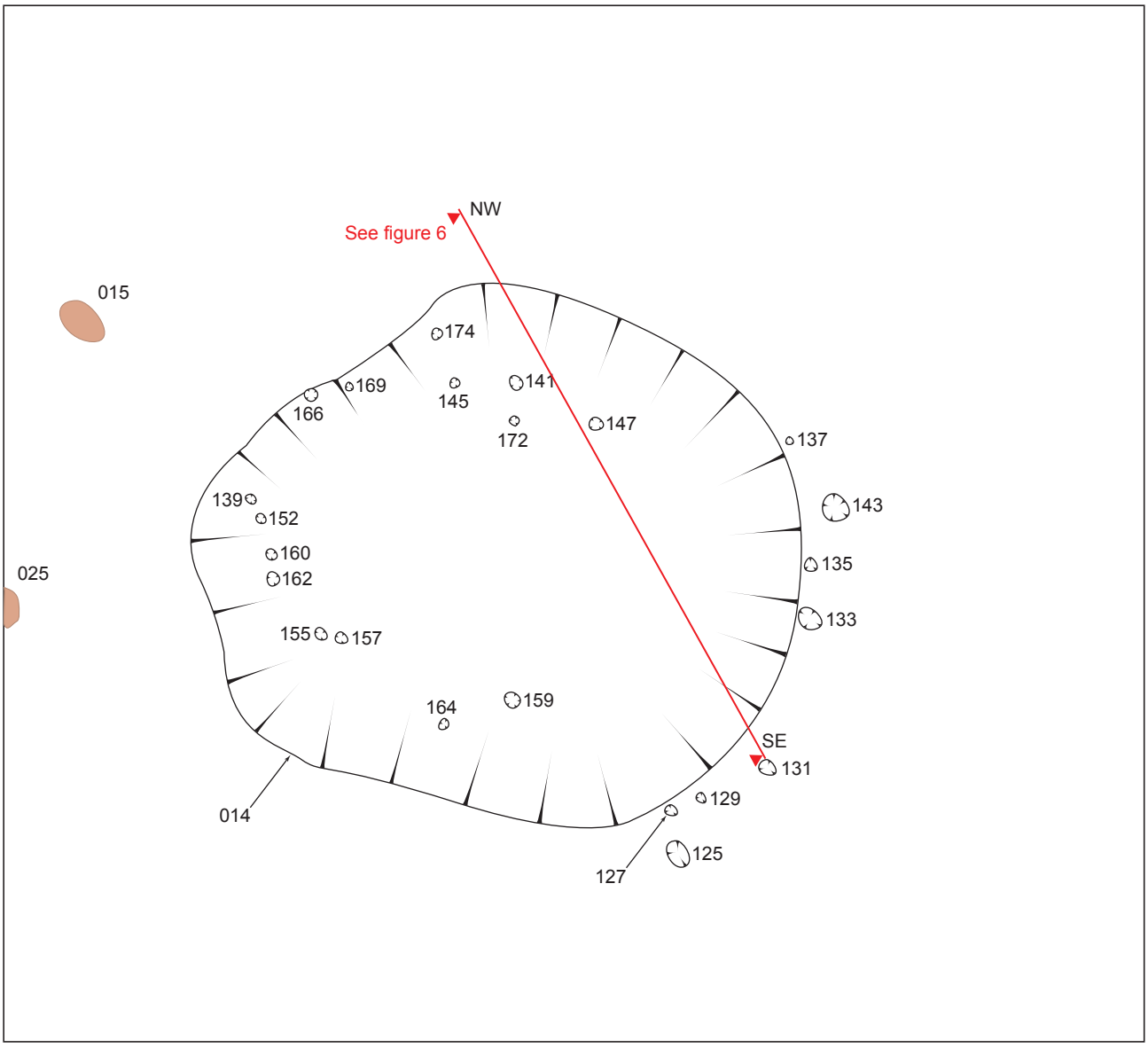


Figure 5 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Killcullen to Moone and Athy Link Road: E2872 detail of trough (014) and associated stakeholes.

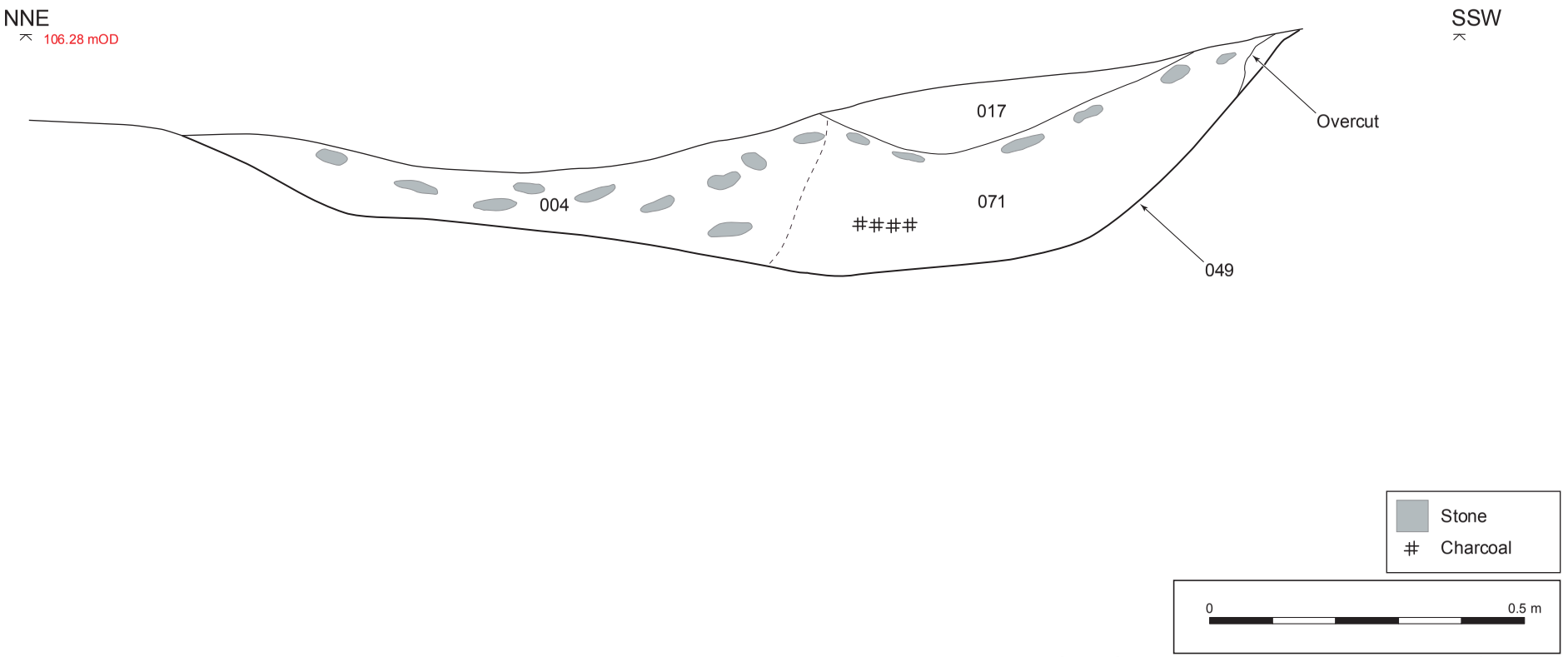


Figure 6 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 – Resolution, Kilcullen to Moone and Athy Link Road: E2872, West-northwest facing section of trough (049).

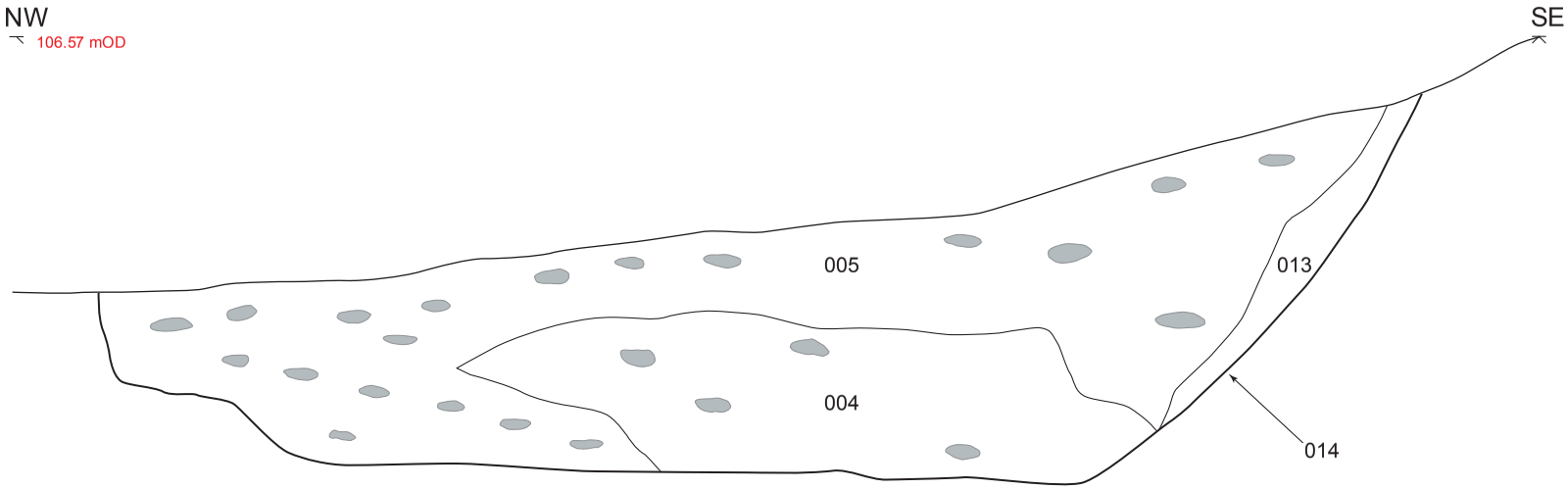


Figure 7 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 – Resolution, Kilcullen to Moone and Athy Link Road: E2872, Southwest facing section of trough (014).

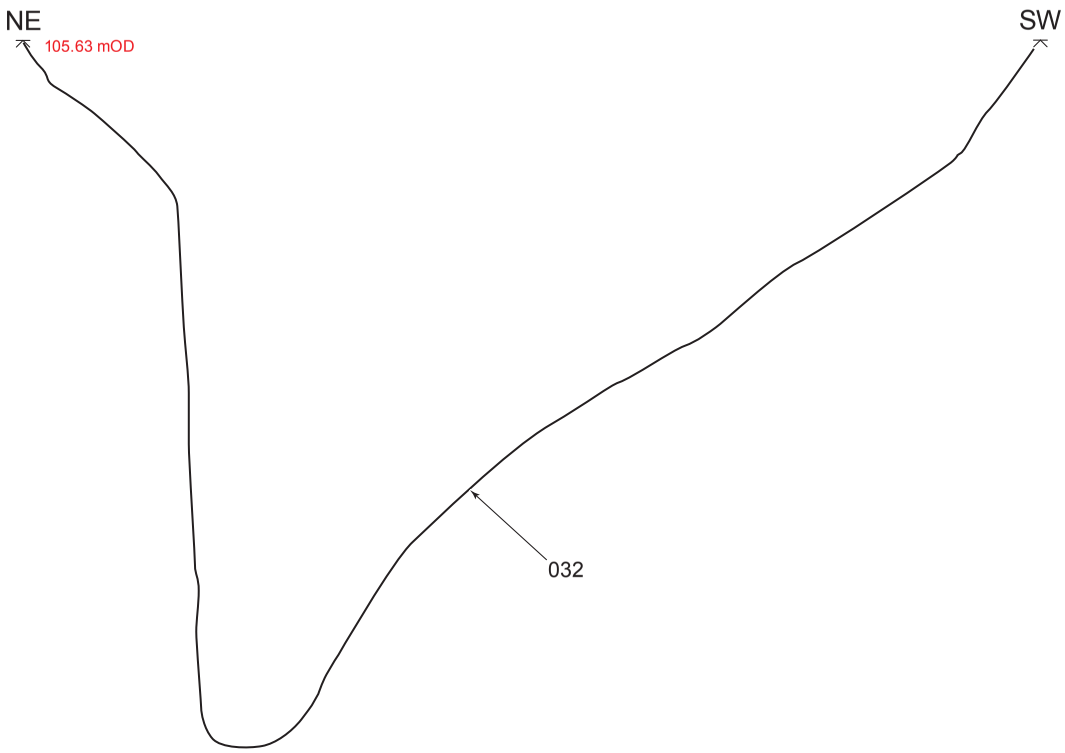


Figure 8 - N9/N10 Kilcullen to Waterford Scheme: Phase 3, Kilcullen to Carlow. Archaeological Services Contract No. 5 – Resolution, Kilcullen to Moone and Athy Link Road: E2872, Southeast facing profile of pit (032).

Plate 1 - Pre-ex of Fulacht mound, facing east.

Plate 2 - Section through trough (014), facing east.

Plate 3 - Post-ex of trough with stake-holes, facing west.

Plate 4 - Post-ex of pit (036), facing west.

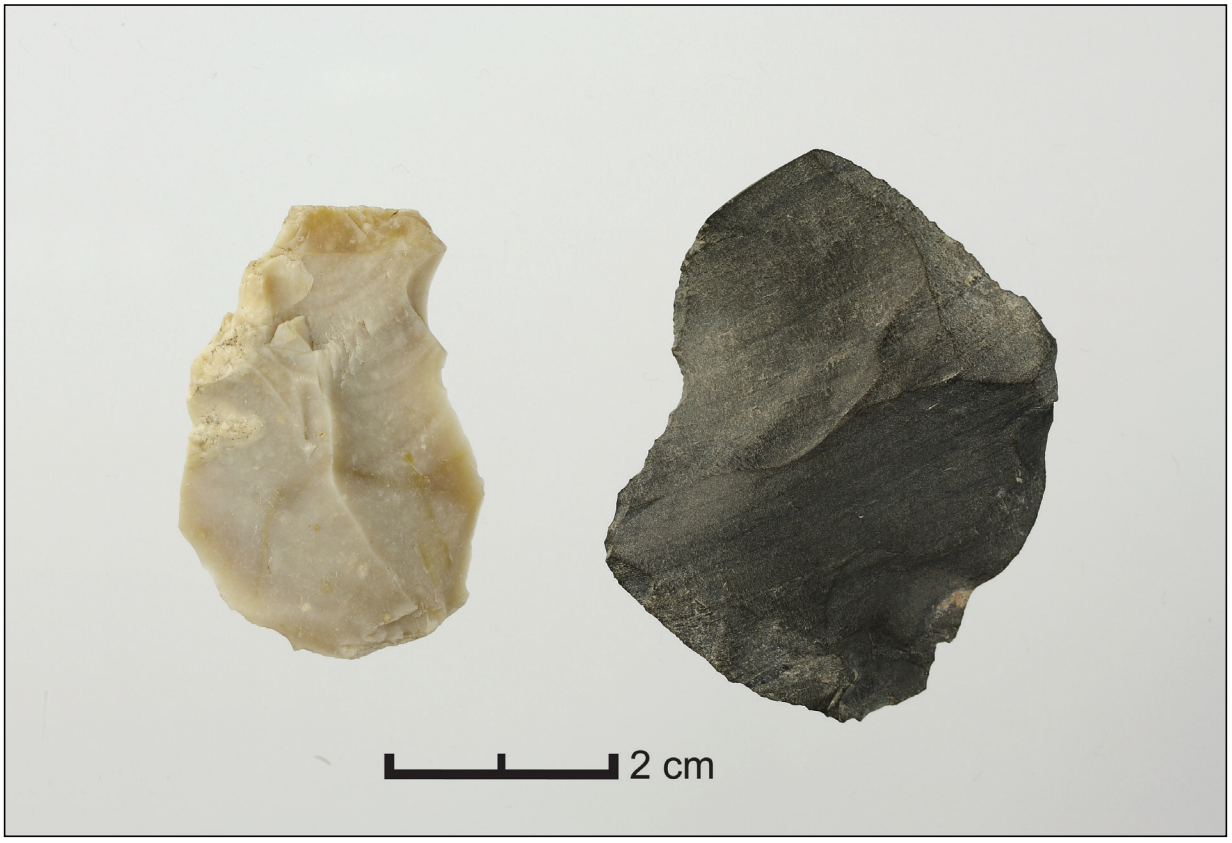


Plate 5 - Flint E2872-066-001 (left), and chert E2872-046-001 (right).

Appendix 1 – Context Register for Site E2872

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(001)	Deposit	-	-	-	-	-	Topsoil	Topsoil
(002)	Deposit	-	-	-	-	-	Natural	Natural
(003)	Fill	-	-	0.70	0.50	0.00	Loose mid-brown sandy silt inclusions of plastic	Modern fill on top of burnt mound
(004)	Deposit	-	-	16.00	9.00	0.90	Compact dark greyish black clayey silt inclusions of heat affected stones, charcoal, wood and flint	Spread of burnt mound material
(005)	Deposit	-	-	3.60	0.00	0.55	Loose dark blackish brown peat inclusions of charcoal and small roots	Spread of burnt mound material, similar to (004) but without the stones
(006)	Void	Void	Void	Void	Void	Void	Void	Void
(007)	Void	Void	Void	Void	Void	Void	Void	Void
(008)	Void	Void	Void	Void	Void	Void	Void	Void
(009)	Void	Void	Void	Void	Void	Void	Void	Void
(010)	Fill	(012)	-	-	-	-	Loose dark brown	Top fill of (012)
(011)	Fill	(012)	-	-	-	-	Firm mid-brown	Fill of (012) same as (102)
(012)	Cut	-	(010) (011) (102)	33.30 within site	1.10	-	Linear feature	Cut of a ditch
(013)	Fill	(014)	-	1.90	1.80	0.42	Loose dark brownish black peat with inclusions of small pebbles	Fill of trough (014), formed during use of burnt mound
(014)	Cut	-	(004) (005) (013)	1.90	1.80	0.51	Sub-circular feature with a sharp to gradual break at top and base, sides vertical base flat	Cut of a trough containing 23 stakeholes
(015)	Cut	-	(016)	0.10	0.09	0.15	Sub-circular feature with sharp break at top and base, sides vertical base tapered rounded	Non-archaeological

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(016)	Fill	(015)	-	0.10	0.09	0.15	Loose mid-orangey brown sandy clayey silt inclusions of pebbles and charcoal	Fill of (015)
(017)	Deposit	-	-	-	-	-	Firm mid-orangey brown clayey sandy silt	Burnt mound material
(018)	Void	Void	Void	Void	Void	Void	Void	Void
(019)	Void	Void	Void	Void	Void	Void	Void	Void
(020)	Void	Void	Void	Void	Void	Void	Void	Void
(021)	Void	Void	Void	Void	Void	Void	Void	Void
(022)	Cut	-	(023)(024)	0.63	0.62	0.20	Sub-circular feature rounded corners, sharp break at top and base, sides concave base tapered round	Non-archaeological
(023)	Fill	(022)	-	0.63	0.62	0.19	Firm mid-brownish black sandy silt inclusions of heat affected stones	Fill of (022)
(024)	Fill	(022)	-	0.63	0.62	0.01	Loose light orangey brown silt	Basal fill (022)
(025)	Cut	-	(026)	0.07	0.08	0.05	Sub-circular feature with sharp break at top and base, sides vertical base rounded point	Non-archaeological
(026)	Fill	(025)	-	0.07	0.08	0.05	Loose dark greyish brown sandy clayey silt inclusions of small stones	Fill of (025)
(027)	Cut	-	(028)(029)	2.36	1.92	0.20	Irregular sub oval feature sharp break at top and base, base flat	Non-archaeological
(028)	Fill	(027)	-	0.55	0.48	0.20	Loose dark brown sand inclusions of charcoal and stones	Non-archaeological
(029)	Fill	(027)	-	2.36	1.40	0.20	Loose brown sand inclusions of bones and stone	Non-archaeological
(030)	Cut	-	(031)	0.52	0.49	0.09	Sub-circular feature gradual break at top imperceptible at base, base concave	Cut of a posthole
(031)	Fill	(030)	-	0.52	0.49	0.09	Loose dark brown sand inclusions of charcoal	Fill of (030)
(032)	Cut	-	(037)(038)	1.38	0.64	0.92	Sub oval feature gradual break at opt and base, sides and base, concave	Cut of a pit

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(033)	Fill	(036)	-	0.98	0.90	0.14	Firm light yellowish brown clayey silt inclusions of large stones and roots	Top fill of pit (036)
(034)	Fill	(036)	-	0.98	0.90	0.13	Loose mid-reddish brown silty clay inclusions of small stones	Basal fill (036)
(035)	Fill	(036)	-	-	-	-	Stone-lining of pit (036), stones are local and had a greenish grey colour	Stone-lining of pit (036), deliberately placed
(036)	Cut	-	(033) (034) (035)	0.98	0.90	0.29	Sub-circular feature sharp break at top gradual at base, sides concave base, irregular and stony	Cut of stone-lined pit
(037)	Fill	(032)	-	0.60	1.10	0.56	Loose mid-greyish brown peat inclusions of charcoal	Basal fill of pit (032)
(038)	Fill	(032)	-	0.35	0.20	0.12	Loose mid-greyish yellow silty clay inclusions of pebbles	Top fill of pit (032)
(039)	Cut	-	(176)	1.33	1.20	0.35	Sub-circular feature sharp to gradual break at top and base, sides concave base, flat	Cut of a pit
(040)	Cut	-	(041)(042)	0.33	0.25	0.08	Irregular feature under fulacht spread, gradual break at top imperceptible at base,	Non-archaeological
(041)	Fill	(040)	-	0.33	0.25	0.08	Loose mid-brown sandy clay	Non-archaeological
(042)	Fill	(040)	-	0.33	0.14	0.04	Loose dark brown sand inclusions of animal bones	Non-archaeological
(043)	Cut	-	(046)				irregular sub-oval shaped cut	Cut of a pit
(044)	Cut	-	(045)	0.43	0.40	0.45	Sub-circular feature sharp break at top gradual at base, sides vertical base rounded point	Cut of a posthole
(045)	Fill	(044)	-	1.50	0.43	0.45	Loose dark reddish brown clayey sandy silt inclusions of small roots	Spread like fill of posthole (044)
(046)	Fill	(043)	-	-	-	-	loose silt	Most likely a hill wash containing chert
(047)	Fill	(048)	-	1.00	0.50	0.10	Loose mid-greyish brown silty clay inclusions of bone and wood	Fill of (048)

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(048)	Cut	-	(047)	1.00	0.80	0.31	Sub-circular feature gradual break at top and base, sides concave base tapered point	Cut of a pit
(049)	Cut	-	(004) (017) (071)	2.03	1.20	0.40	Sub oval feature gradual break at top and base, sides rounded base concave	Cut of a possible trough
(050)	Deposit	-	-	8.60	4.00	0.10	Loose light yellowish grey sandy silt	Burnt mound (017)
(051)	Void	Void	Void	Void	Void	Void	Void	Void
(052)	Deposit	-	-	4.50	1.50	0.20	Loose dark reddish brown sandy silt inclusions of fulacht material and roots	Burnt mound material
(053)	Deposit	-	-	0.00	0.00	0.00	Loose dark orangey brown sandy silt inclusions of fulacht material and roots	Burnt mound material
(054)	Deposit	-	-	8.00	1.10	0.20	Firm light grey silty clay inclusions of pebbles	Deposit of natural possible hill wash disturbing fulacht spread (004)
(055)	Deposit	-	-	3.60	1.20	0.17	Loose dark orangey brown clayey silty peat inclusions of small stones, charcoal, wood and bone	Spread SW of burnt mound
(056)	Deposit	-	-	1.04	0.60	0.09	Loose dark reddish brown sandy clayey silt inclusions of stones and bones	Shallow spread south of and similar to (055)
(057)	Cut	-	(058)	0.12	0.11	0.16	Sub-circular feature sharp break at top and base, sides and base, concave, sloping into the ground	Cut of a stake-hole
(058)	Fill	(057)	-	0.20	0.11	0.16	Loose mid-reddish brown clayey sand inclusions of charcoal	Fill of (057)
(059)	Deposit	-	-	1.30	0.90	0.20	Loose light yellowish grey silty sand	Deposit above burnt mound spread (004), related to the burnt mound
(060)	Cut	-	(061)	3.20	0.55	0.12	Linear feature gradual break at top and base, sides concave base, flat	Cut of a furrow
(061)	Fill	(060)	-	3.20	0.55	0.12	Loose light orangey brown sandy silty clay	Fill of ditch (060)

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
							inclusions of pebbles	
(062)	Void	Void	Void	Void	Void	Void	Void	Void
(063)	Cut	-	(064)(065)	1.20	0.76	0.18	Irregular sub oval feature sharp break at top and base, sides vertical base, irregular	Cut of a pit
(064)	Fill	(063)	-	1.10	0.76	0.12	Loose dark brownish grey mottled with charcoal clayey sandy silt with inclusions of charcoal and pebbles	Basal fill in (063)
(065)	Fill	(063)	-	1.73	0.76	0.07	Loose mid-orangey grey mottled with charcoal silty clayey sand, inclusions of pebbles and charcoal	Top fill of (063)
(066)	Deposit	-	-	-	-	-	Loose mid-reddish brown clayey silt inclusions of flint	Spread cut by (096) and (098)
(067)	Void	Void	Void	Void	Void	Void	Void	Void
(068)	Cut	-	(069)	0.06	0.04	0.36	Sub-circular feature sharp break at top sides are vertical, cut is sloping into the ground	Cut of a stake-hole
(069)	Fill	(068)	-	0.06	0.04	0.36	Loose light reddish brown sandy silt inclusions of charcoal	Fill of stake-hole (068)
(070)	Cut	-	(095)	0.08	0.07	0.21	Sub oval feature sharp break at top sides vertical, cut is sloping into the ground	Cut of a stake-hole
(071)	Fill	(049)	-	2.03	1.20	0.40	Loose mid-brownish grey silty clay	Fill of (049)
(072)	Void	Void	Void	Void	Void	Void	Void	Void
(073)	Cut	-	(074)	0.10	0.10	0.07	Sub-circular feature sharp break at top gradual at base, sides vertical base flat	Cut of a possible stake-hole
(074)	Fill	(073)	-	0.10	0.10	0.07	Loose mid-reddish brown sandy silt	Fill of (073)
(075)	Cut	-	(076)	0.04	0.03	0.23	Sub-circular feature sharp break at top sides are vertical, cut is curving into the ground	Cut of a stake-hole
(076)	Fill	(075)	-	0.04	0.03	0.23	Loose dark orangey brown clayey silt inclusions of pebbles	Fill of (075)
(077)	Cut	-	(078)	0.05	0.04	0.28	Sub-circular feature sharp break at top sides	Cut of a stake-hole

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
							are vertical, cut goes straight into the ground	
(078)	Fill	(077)	-	0.05	0.04	0.28	Loose dark orangey brown clayey silt inclusions of pebbles and roots	Fill of (077)
(079)	Cut	-	(080)	0.04	0.04	0.23	Sub-circular feature sharp break at top sides vertical, cut is sloping into the ground	Cut of a stake-hole
(080)	Fill	(079)	-	0.04	0.04	0.23	Loose mid-orangey brown sandy silt inclusions of pebbles and roots	Fill of (079)
(081)	Cut	-	(082)	0.05	0.04	0.26	Sub-circular feature sharp break at top sides are vertical, cut goes straight into the ground	Cut of a stake-hole
(082)	Fill	(081)	-	0.05	0.04	0.26	Loose dark orangey brown clayey silt inclusions of pebbles	Fill of (081)
(083)	Cut	-	(084)	0.06	0.06	0.28	Sub-circular feature sharp break at top sides vertical, cut is sloping into the ground	Cut of a stake-hole
(084)	Fill	(083)	-	0.06	0.06	0.28	Loose dark orangey brown clayey silt inclusions of pebbles	Fill of (083)
(085)	Cut	-	(086)	0.11	0.10	0.19	Sub-circular feature sharp break at top sides are vertical, cut goes straight into the ground	Cut of a stake-hole
(086)	Fill	(085)	-	0.11	0.10	0.19	Loose mid-orangey brown clayey silt inclusions of pebbles and roots	Fill of (085)
(087)	Cut	-	(088)	0.07	0.06	0.21	Sub-circular feature sharp break at top sides are vertical, cut is curving into the ground	Non-archaeological
(088)	Fill	(087)	-	0.07	0.06	0.21	Loose mid-orangey brown clayey silt inclusions of pebbles and roots	Fill of (087)
(089)	Cut	-	(090)	0.08	0.06	0.15	Sub-circular feature sharp break at top sides vertical, cut is slightly sloping into the ground	Cut of a stake-hole
(090)	Fill	(089)	-	0.08	0.06	0.15	Loose dark orangey brown clayey silt inclusions of pebbles and roots	Fill of (089)
(091)	Cut	-	(092)	0.02	0.01	0.20	Sub-circular feature sharp break at top sides vertical, cut is sloping into the ground	Cut of a stake-hole

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(092)	Fill	(091)	-	0.02	0.01	0.20	Loose dark orangey brown clayey silt inclusions of pebbles and roots	Fill of (091)
(093)	Cut	-	(094)	0.06	0.04	0.33	Sub-circular feature sharp break at top sides vertical, cut is slightly sloping into the ground	Cut of a stake-hole
(094)	Fill	(093)	-	0.06	0.04	0.33	Loose dark orangey brown clayey silt inclusions of pebbles and roots	Fill of (093)
(095)	Fill	(070)	-	0.08	0.07	0.21	Fill without charcoal	Fill of (070)
(096)	Cut	-	(097)	0.53	0.51	0.12	Sub-circular feature gradual break at top and base, sides concave base blunt	Cut of a sub-circular feature
(097)	Fill	(096)	-	0.53	0.51	0.12	Loose black brownish orange peat inclusions of small roots	Fill of (096)
(098)	Cut	-	(099)	0.42	0.40	0.12	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point	Cut of a sub-circular feature
(099)	Fill	(098)	-	0.42	0.40	0.09	Loose blackish brown peat inclusions of small roots	Shallow organic fill of (098)
(100)	Cut	-	(101)	0.28	0.28	0.15	Sub-circular feature sharp break at top gradual at base, sides and base concave	Cut of a posthole
(101)	Fill	(100)	-	0.28	0.28	0.15	Loose mid-blackish brown sandy silt inclusions of roots	Fill of (100)
(102)	Fill	(012)	-	33.30	1.10	0.21	Loose mid-orangey brown sandy silty clay inclusions of roots and stones	Fill of ditch (012), same as (011) a piece of flint was found
(103)	Cut	-	(104)	0.12	0.10	0.53	Sub-circular feature sharp break at top, sides vertical, gently sloping into the ground	Cut of a stake-hole
(104)	Fill	(103)	-	0.12	0.10	0.53	Loose dark orangey brown clayey silt inclusions of roots	Fill of stake-hole (103)
(105)	Cut	-	(106)	0.07	0.05	0.32	Sub-circular feature sharp break at top sides vertical, sloping into the ground	Cut of a stake-hole

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(106)	Fill	(105)	-	0.07	0.05	0.32	Loose dark orangey brown clayey silt inclusions of roots	Fill of (105)
(107)	Cut	-	(108)	0.06	0.04	0.42	Sub-circular feature sharp break at top, sides vertical, gently sloping into the ground	Cut of a stake-hole
(108)	Fill	(107)	-	0.06	0.04	0.42	Loose dark orangey brown clayey silt inclusions of roots	Fill of (107)
(109)	Cut	-	(110)	0.12	0.10	0.56	Sub-circular feature sharp break at top, sides vertical, cuts straight into the ground	Cut of a posthole
(110)	Fill	(109)	-	0.12	0.10	0.56	Loose dark orangey brown clayey silt inclusions of roots	Fill of (109)
(111)	Cut	-	(112)	0.04	0.03	0.21	Sub-circular feature sharp break at top sides vertical, sloping into the ground	Cut of a stake-hole
(112)	Fill	(111)	-	0.04	0.03	0.21	Loose dark orangey brown clayey silt	Fill of (111)
(113)	Cut	-	(114)	0.08	0.06	0.21	Sub-circular feature sharp break at top and base, sides vertical base tapered rounded	Cut of a stake-hole
(114)	Fill	(113)	-	0.08	0.06	0.21	Loose dark orangey brown clayey silt inclusions of roots	Fill of (113)
(115)	Cut	-	(116)	0.14	0.12	0.62	Sub-circular feature sharp break at top, sides vertical, cuts straight into the ground	Cut of a stake-hole
(116)	Fill	(115)	-	0.14	0.12	0.62	Loose dark orangey brown clayey silt inclusions of roots	Fill of (115)
(117)	Cut	-	(118)	0.07	0.05	0.23	Sub-circular feature sharp break at top and base, sides vertical base tapered rounded cutting straight into the ground	Cut of a stake-hole
(118)	Fill	(117)	-	0.07	0.05	0.23	Loose dark orangey brown clayey silt inclusions of roots	Fill of (117)
(119)	Cut	-	(120)	0.05	0.05	0.32	Sub-circular feature sharp break at top and base, sides vertical base tapered rounded cutting straight into the ground	Cut of a stake-hole
(120)	Fill	(119)	-	0.05	0.05	0.32	Loose dark orangey brown clayey silt	Fill of (119)

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
							inclusions of roots	
(121)	Cut	-	(122)	0.11	0.10	0.36	Sub-circular feature sharp break at top and base, sides vertical base tapered rounded cutting straight into the ground	Cut of a stake-hole
(122)	Fill	(121)	-	0.11	0.10	0.36	Loose dark orangey brown clayey silt inclusions of roots	Fill of (121)
(123)	Cut	-	(124)	0.04	0.04	0.29	Sub-circular feature sharp break at top and base, sides vertical base tapered rounded gently sloping into the ground	Cut of a stake-hole
(124)	Fill	(123)	-	0.04	0.04	0.29	Loose mid-orangey brown clayey silt inclusions of pebbles and roots	Fill of (123)
(125)	Cut	-	(126)	0.10	0.10	0.38	Sub-circular feature sharp break at top gradual at base,, sides vertical base, tapered point cut straight into the ground	Cut of a stake-hole
(126)	Fill	(125)	-	0.10	0.10	0.38	Loose mid-brownish grey silty clay inclusions of pebbles	Fill of (125)
(127)	Cut	-	(128)	0.05	0.05	0.08	Sub-circular feature sharp break at top gradual at base, sides vertical base, tapered point gently sloping into the ground	Cut of a stake-hole
(128)	Fill	(127)	-	0.05	0.05	0.08	Loose mid-brownish grey silty sand	Fill of (127)
(129)	Cut	-	(130)	0.04	0.04	0.10	Sub-circular feature sharp break at top gradual at base,, sides vertical base, flat cut straight into the ground	Cut of a stake-hole
(130)	Fill	(129)	-	0.04	0.04	0.10	Loose mid-brownish grey silty clay inclusions of pebbles	Fill of (129)
(131)	Cut	-	(132)	0.06	0.06	0.27	Sub-circular feature sharp break at top gradual at base, sides vertical base, flat cut straight into the ground	Cut of a stake-hole
(132)	Fill	(131)	-	0.06	0.06	0.27	Loose mid-brownish grey silty sand inclusions of pebbles	Fill of (131)

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(133)	Cut	-	(134)	0.08	0.06	0.25	Sub-circular feature sharp break at top, sides vertical, sloping into the ground	Cut of a stake-hole
(134)	Fill	(133)	-	0.08	0.06	0.25	Loose dark brownish grey silty sand	Fill of (133)
(135)	Cut	-	(136)	0.04	0.03	0.09	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(136)	Fill	(135)	-	0.04	0.03	0.09	Loose mid-greyish brown silty sand inclusions of small pebbles	Fill of (135)
(137)	Cut	-	(138)	0.05	0.05	0.10	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point gently sloping into the ground	Cut of a stake-hole
(138)	Fill	(137)	-	0.05	0.05	0.10	Loose dark brownish grey silty sand	Fill of (137)
(139)	Cut	-	(140)	0.03	0.03	0.10	Sub-circular feature sharp break at top gradual at base,, sides vertical base, flat cut straight into the ground	Cut of a stake-hole
(140)	Fill	(139)	-	0.03	0.03	0.10	Loose mid-greyish brown silty sand inclusions of small pebbles	Fill of (139)
(141)	Cut	-	(142)	0.08	0.08	0.18	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point gently sloping into the ground	Cut of a stake-hole
(142)	Fill	(141)	-	0.08	0.08	0.18	Loose light yellowish grey silty sand inclusions of pebbles	Fill of (141)
(143)	Cut	-	(144)	0.11	0.10	0.59	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(144)	Fill	(143)	-	0.11	0.10	0.59	Loose dark brownish grey silty sand inclusions of pebbles	Fill of (143)
(145)	Cut	-	(146)	0.04	0.03	0.17	Sub-circular feature sharp break at opt gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(146)	Fill	(145)	-	0.04	0.03	0.17	Loose mid-brownish grey sandy clay inclusions of pebbles	Fill of (145)
(147)	Cut	-	(148)	0.04	0.04	0.18	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point cut straight into the ground	Cut of a stake-hole
(148)	Fill	(147)	-	0.04	0.04	0.18	Loose greyish brown silty sand inclusions of pebbles	Fill of (147)
(149)	Cut	-	(150)(151)	3.20	0.80	0.20	Sub oval feature rounded corners gradual break at top and base, sides are stepped to rounded base tapered rounded	Cut of a pit
(150)	Fill	(149)	-	3.30	0.75	0.05	Loose light pinkish brown peat inclusions of wood and charcoal	Basal fill of (149)
(151)	Fill	(149)	-	3.30	0.80	0.27	Spongy dark blackish brown peat inclusions of wood	Top fill of (149)
(152)	Cut	-	(153)	0.05	0.04	0.27	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(153)	Fill	(152)	-	0.05	0.04	0.27	Loose mid-greyish brown silty sand inclusions of small pebbles	Fill of (152)
(154)	Fill	(155)	-	0.04	0.04	0.10	Loose dark greyish brown clayey sand	Fill of (155)
(155)	Cut	-	(154)	0.04	0.04	0.10	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point cut straight into the ground	Cut of a stake-hole
(156)	Fill	(157)	-	0.04	0.04	0.14	Loose mid-orangey brown silty clay	Fill of (157)
(157)	Cut	-	(156)	0.04	0.04	0.14	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point gently sloping into the ground	Cut of a stake-hole
(158)	Fill	(159)	-	0.04	0.04	0.14	Loose mid-brownish grey silty clay	Fill of (159)
(159)	Cut	-	(158)	0.04	0.04	0.14	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered	Cut of a stake-hole

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
							point gently sloping into the ground	
(160)	Cut	-	(161)	0.04	0.04	0.14	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(161)	Fill	(160)	-	0.04	0.04	0.14	Loose mid-greyish brown silty sand inclusions of small pebbles	Fill of (160)
(162)	Cut	-	(163)	0.05	0.04	0.18	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(163)	Fill	(162)	-	0.05	0.04	0.18	Loose mid-greyish brown silty clay inclusions of small pebbles	Fill of (162)
(164)	Cut	-	(165)	0.06	0.05	0.28	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered cut straight into the ground	Cut of a stake-hole
(165)	Fill	(164)	-	0.06	0.05	0.28	Loose mid-greyish brown silty clay inclusions of small pebbles	Fill of (164)
(166)	Cut	-	(167)	0.05	0.04	0.25	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(167)	Fill	(166)	-	0.05	0.04	0.25	Loose dark greyish brown silty clay inclusions of small pebbles	Fill of (166)
(168)	Fill	(169)	-	0.03	0.03	0.18	Loose mid-brownish grey silty clay	Fill of (169)
(169)	Cut	-	(168)	0.03	0.03	0.18	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered point slightly sloping into the ground	Cut of a stake-hole
(170)	Cut	-	(171)	0.14	0.08	0.24	Sub-circular feature sharp break at top gradual at base, sides vertical base tapered rounded	Cut of a stake-hole
(171)	Fill	(170)	-	0.14	0.08	0.24	Loose light yellowish brown clayey silt inclusions of flint and pebbles	Fill of (170)

Context no.	Type	Fill of:	Filled by:	Length (m)	Width (m)	Depth (m)	Description	Interpretation
(172)	Cut	-	(173)	0.05	0.04	0.14	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(173)	Fill	(172)	-	0.05	0.04	0.14	Loose light brownish grey silty clay inclusions of small pebbles	Fill of (172)
(174)	Cut	-	(175)	0.05	0.05	0.14	Sub-circular feature sharp break at top gradual at base, sides vertical base flat cut straight into the ground	Cut of a stake-hole
(175)	Fill	(174)	-	0.05	0.05	0.14	Loose light brownish grey silty clay inclusions of small pebbles	Fill of (174)
(176)	Fill	(039)	-	1.33	1.20	0.35	Compact dark greyish black clayey silt with inclusions of heat affected stones, charcoal,	Fill of (039)

Appendix 2 – Finds Register for Site E2872

Find no.	Material	Type	Identification	Description
E2872:001:001	Stone	Flint	Prehistoric	Light greyish buff flint debitage
E2872:004:001	Stone	Flint	Prehistoric	Mid greyish buff flint debitage
E2872:046:001	Stone	Chert	Prehistoric	Dark greyish black utilised flake
E2872:056:001	Stone	Flint	Prehistoric	Dark buff flint debitage
E2872:066:001	Stone	Flint	Prehistoric	Light buff grey distally retouched flake
E2872:102:001	Stone	Flint	Prehistoric	Light whitish grey utilised flake
E2872:171:001	Stone	Flint	Prehistoric	Light grey opaque flint debitage
E2872:171:002	Stone	Flint	Prehistoric	Light whitish grey flint debitage

Appendix 3 – Sample Register for Site E2872

Sample no.	Context no.	Description
E2872:001	(016)	Mid-orangeish brown fill of stake-hole (015)
E2872:002	(013)	Dark brownish black fill of (014)
E2872:003	(019)	Dark blackish brown fill of stake-hole (018) Non-archaeological
E2872:004	(021)	Dark blackish brown fill of (020) Non-archaeological
E2872:005	(026)	Dark blackish brown fill of (025)
E2872:006	(007)	Bone, probably femur of young cow Non-archaeological
E2872:007	-	Bone fill of (027)
E2872:008	(029)	Bone fill of (027)
E2872:009	(017)	Horse tooth
E2872:010	(028)	Dark brown fill of (027)
E2872:011	(029)	Brown fill of (027)
E2872:012	-	Dark brown fill of (030)
E2872:013	(033)	Light whitish brown clayey silt (036)
E2872:014	(034)	Mid-whitish brown silty clay (036)
E2872:015	(034)	Bone from pit (036)
E2872:016	(037)	Mid-greyish brown fill (032)
E2872:017	(038)	Mid-greyish yellow fill (032) maybe redeposit
E2872:018	(004)	Animal bone sample from fill (004) in (032)
E2872:019	(004)	Dark blackish brown stony fill of (039)
E2872:020	(017)	Animal bone in fill (017) in Area 3 of Fulacht
E2872:021	(042)	Dark brown with animal bone (040)
E2872:022	(017)	Bone
E2872:023	(038)	Animal teeth in the middle of Area 3 in Fulacht
E2872:024	(034)	Animal bone from Pit (036)
E2872:025	(034)	Jaw + teeth from animal in (036)
E2872:026	(034)	Jaw + teeth from animal in (036)
E2872:027	(038)	Animal bone under burnt wood, under (038)
E2872:028	(047)	Mid-greyish brown fill of (048)
E2872:029	(048)	Animal bone in cut (048)
E2872:030	(046)	Dark reddish brown fill of (043)
E2872:031	(045)	Dark reddish brown fill of (044)
E2872:032	(005)	Dark blackish brown, Fulacht
E2872:033	(017)	Mid-orange brown fill
E2872:034	(004)	Piece of wood from Fulacht material (004)
E2872:035	(038)	Piece of wood from pit (032)
E2872:036	(038)	Piece of burnt wood in fill (038)
E2872:037	(038)	Piece of burnt wood in fill (038)
E2872:038	(038)	Piece of burnt wood in fill (038)
E2872:039	(038)	Piece of burnt wood in fill (038)
E2872:040	(038)	Piece of burnt wood in fill (038)
E2872:041	(004)	Fill of Fulacht (004)
E2872:042	(055)	Charcoal deposit/spread
E2872:043	(050)	Fill (050) in *fulacht*
E2872:044	(055)	Bones with cut marks
E2872:045	(004)	Animal bone from upper fill in *fulacht*

Sample no.	Context no.	Description
E2872:046	(056)	Animal tooth
E2872:047	(056)	Dark reddish brown
E2872:048	(059)	Light grey fill of Fulacht Area 1
E2872:049	(064)	Dark brownish grey mottled with charcoal in (063)
E2872:050	(069)	Mid-reddish brown fill of stake-hole
E2872:051	(005)	Animal tooth
E2872:052	(058)	Mid-reddish brown fill of stake-hole (057)
E2872:053	(074)	Mid-reddish brown fill of (073)
E2872:054	(071)	Mid-brownish grey fill in (043)
E2872:055	(097)	Black brownish organic fill of (096)
E2872:056	(099)	Black brownish organic fill of (098)
E2872:057	(053)	Orangeish fill in *fulacht*
E2872:058	(101)	Mid-brown fill of posthole (100)
E2872:059	(052)	Dark reddish brown fill of *fulacht*
E2872:060	(005)	Void?
E2872:061	(066)	Mid-reddish brown spread
E2872:062	(010)	Animal bone from (012)
E2872:063	(010), (011)	Snails from (010) and (011) in (012) Slot 2
E2872:064	(126)	Mid-brownish grey fill of (125)
E2872:065	(128)	Dark brownish grey fill of (127)
E2872:066	(130)	Mid-brownish grey fill in stake-hole (129)
E2872:067	(132)	Mid-brownish grey fill in stake-hole (131)
E2872:068	(134)	Dark brownish grey fill of (133)
E2872:069	(136)	Light yellowish grey fill of (135)
E2872:070	(138)	Light yellowish grey fill of (137)
E2872:071	(140)	Mid-brownish grey fill of (139)
E2872:072	(142)	Light yellowish grey fill of (141)
E2872:073	(144)	Dark brownish grey fill of (143)
E2872:074	(146)	Mid-brownish grey fill of (145)
E2872:075	(148)	Mid-greyish brown fill of (147)
E2872:076	(153)	Mid-greyish brown fill of (152)
E2872:077	(154)	Dark greyish brown fill of (155)
E2872:078	(156)	Mid-orangeish brown fill of (157)
E2872:079	(158)	Mid-brownish grey fill of (159)
E2872:080	(161)	Mid-greyish brown fill of (160)
E2872:081	(163)	Mid-greyish brown fill of (162)
E2872:082	(165)	Mid-greyish brown fill of (164)
E2872:083	(167)	Dark greyish brown fill of (166)
E2872:084	(168)	Mid-brownish grey fill of (169)
E2872:085	(171)	Light yellowish brown fill of posthole (170)
E2872:086	(173)	Light brownish grey of (172)
E2872:087	(175)	Light brownish grey of (174)
E2872:088	(080)	Mid-orangeish brown fill (079)
E2872:089	(010)	Plastic fill of (012)

Appendix 4 – Photo Register for Site E2872

Photo Number	Direction facing	Description
E2872:1	S	Pre-ex of site
E2872:2	S	Pre-ex of site
E2872:3	S	Pre-ex of site
E2872:4	S	Pre-ex of site
E2872:5	N	Working shot
E2872:6	N	Working shot
E2872:7	N	Working shot
E2872:8	E	Section in fulacht showing (003)(004)
E2872:9	E	Fill (003) from above
E2872:10	E	Mid-ex of *fulacht*
E2872:11	E	Mid-ex of *fulacht*
E2872:12	E	Mid-ex of *fulacht*
E2872:13	W	Brown spread with animal bones (027)
E2872:14	W	Brown spread with animal bones (027)
E2872:15	W	Brown spread with animal bones (027)
E2872:16	W	Brown spread with animal bones (027)
E2872:17	W	Brown spread with animal bones (027)
E2872:18	W	Section of brown spread with bones (027)
E2872:19	W	Section of brown spread with bones (027)
E2872:20	W	Section of
E2872:21	S	N facing section (032)
E2872:22	S	N facing section (032)
E2872:23	S	N facing section (032)
E2872:24	W	Mid-ex (036)
E2872:25	W	Mid-ex (036)
E2872:26	W	Mid-ex (036)
E2872:27	W	Mid-ex (036)
E2872:28	W	Mid-ex (036)
E2872:29	S	Mid-ex (036)
E2872:30	E	Piece of wood in (032)(038)
E2872:31	E	Piece of wood in (032)(038)
E2872:32	E	Mid-ex (036)
E2872:33	E	Mid-ex (036)
E2872:34	E	Mid-ex (036)
E2872:35	N	Pre-ex of (039)
E2872:36	E	Pre-ex of fulacht (040) area 3
E2872:37	N	Mid-ex (039)
E2872:38	N	Post-ex (032)
E2872:39	N	Post-ex (032)
E2872:40	N	Post-ex (039)
E2872:41	W	Post-ex (039)
E2872:42	S	Post-ex (039)
E2872:43	W	Mid-ex (040)
E2872:44	NW	Mid-ex
E2872:45	E	Mid-ex (036)

Photo Number	Direction facing	Description
E2872:46	E	Mid-ex (036)
E2872:47	S	Burnt wood under (038)
E2872:48	S	Burnt wood under (038)
E2872:49	S	Burnt wood under (038)
E2872:50	E	Bone + Teeth in (036)(034)
E2872:51	E	Bone + Teeth in (036)(034)
E2872:52	S	Bone + Teeth in (036)(034)
E2872:53	W	Post-ex of (036)
E2872:54	E	Pre-ex of oval feature
E2872:55	E	Mid-ex of (043) possible posthole
E2872:56	N	Mid-ex posthole (044)
E2872:57	N	Mid-ex posthole (044)
E2872:58	E	Mid-ex (048)
E2872:59	E	Mid-ex (048)
E2872:60	E	Post-ex (048)
E2872:61	N	Working shot
E2872:62	N	Working shot
E2872:63	N	Working shot
E2872:64	N	Working shot
E2872:65	N	Working shot
E2872:66	N	Working shot
E2872:67	N	Working shot
E2872:68	N	Working shot
E2872:69	N	Working shot
E2872:70	S	Pollen analysis in section 16 area 3
E2872:71	E	W facing section *fulacht* area 3
E2872:72	E	W facing section *fulacht* area 3
E2872:73	E	W facing section *fulacht* area 3
E2872:74	E	W facing section *fulacht* area 3
E2872:75	E	W facing section *fulacht* area 3
E2872:76	N	S facing section *fulacht* area 1
E2872:77	N	S facing section *fulacht* area 1
E2872:78	N	S facing section *fulacht* area 1
E2872:79	W	E facing section *fulacht* area 1
E2872:80	W	E facing section *fulacht* area 1
E2872:81	W	E facing section *fulacht* area 1
E2872:82	S	N facing section *fulacht* area 3
E2872:83	S	N facing section *fulacht* area 3
E2872:84	S	N facing section *fulacht* area 3
E2872:85	E	Spread SE of *fulacht*
E2872:86	S	Spread SE of *fulacht*
E2872:87	E	Spread SE of *fulacht*
E2872:88	E	Post-ex of spread with (055)
E2872:89	SE	Pre-ex of feature SW of *fulacht* (056)
E2872:90	E	Pre-ex of spread SW of *fulacht*
E2872:91	E	Pre-ex of spread SW of *fulacht*
E2872:92	S	Pre-ex of spread SW of *fulacht*
E2872:93	SE	Mid-ex of spread (056)

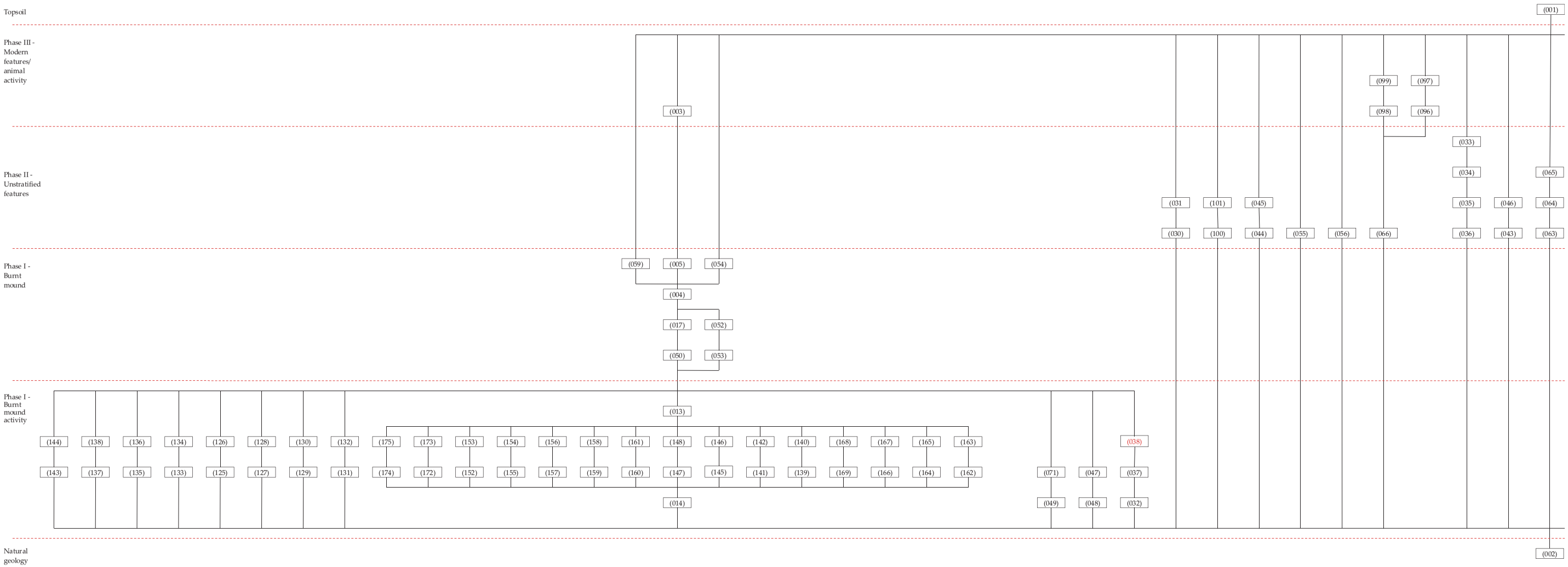
Photo Number	Direction facing	Description
E2872:94	SE	Post-ex of spread (056)
E2872:95	E	Pre-ex of (049)
E2872:96	W	Pre-ex of (049)
E2872:97	SE	Mid-ex (063)
E2872:98	SE	Mid-ex (060)
E2872:99	E	Pre-ex (014)
E2872:100	N	Pre-ex of trough
E2872:101	W	Pre-ex of trough
E2872:102	SE	Post-ex (063)
E2872:103	E	Working shot (014)
E2872:104	E	W facing section (014)
E2872:105	E	W facing section (014)
E2872:106	W	Post-ex (049)
E2872:107	E	Post-ex (049)
E2872:108	NE	SW facing section (100)
E2872:109	NE	Post-ex of (100)
E2872:110	N	Working shot area 4 fulacht
E2872:111	SW	Post-ex (012) slot 2
E2872:112	W	Working shot
E2872:113	W	Working shot
E2872:114	W	Working shot
E2872:115	W	Working shot
E2872:116	W	Working shot
E2872:117	W	Working shot
E2872:118	W	Working shot
E2872:119	W	Working shot
E2872:120	W	Working shot
E2872:121	W	Post-ex (014)
E2872:122	W	Working shot
E2872:123	W	Working shot
E2872:124	W	Working shot
E2872:125	W	Working shot
E2872:126	W	Working shot
E2872:127	W	Working shot
E2872:128	E	Post-ex (014)
E2872:129	W	Post-ex (014)
E2872:130	E	Mid-ex (149)
E2872:131	N	S facing section (149)
E2872:132	S	N facing section (149)
E2872:133	S	(012) slot 1
E2872:134	S	(012) slot 1
E2872:135	S	Section taken on 24-07-07
E2872:136	S	Working Shot
E2872:137	S	Working Shot
E2872:138	S	Working Shot
E2872:139	S	Working Shot
E2872:140	S	Working Shot

Appendix 5 – Drawing Register for Site E2872

Drawing No.	Type	Scale	Description
E2872:1	Plan	01:50	Pre-ex plan of fulacht in E 2872
E2872:2	Section	01:10	Section drawing of ditch (012)
E2872:3	-	-	Void
E2872:4	Plan	01:20	Pre-ex plan of possible feature with human and animal bones
E2872:5	Section	01:10	Mid-ex. West facing section of (022)
E2872:6	Section	01:10	Mid-ex. West facing section of (027)
E2872:7	Section	01:10	Mid-ex. East facing section of (030)
E2872:8	Section	01:10	Mid-ex. North facing section of (032)
E2872:9	Section	01:10	Mid-ex. Plan of pit (036)
E2872:10	Section		Void
E2872:11	Section	01:10	Section Southeast facing of pit (039)
E2872:12	Section	01:10	Profile North facing of (032), Post-ex
E2872:13	Plan	01:20	Mid-ex of pit (036)
E2872:14	Section	01:10	Mid-ex of pit (036) section facing west
E2872:15	Section	01:10	Mid-ex of possible posthole (048) west facing section
E2872:16	Section	01:10	North facing section of fulacht in Area 3
E2872:17	Section	01:10	South facing section of *fulacht* in Area 1
E2872:18	Section	01:10	West facing section of *fulacht* in Area 3
E2872:19	Section	01:10	East facing section of *fulacht* in Area 1
E2872:20	Section	01:10	Section facing south (044)
E2872:21	Section	01:10	Section facing west (043) Non-archaeological
E2872:22	Plan	01:50	Mid-ex of Area 4 in *fulacht*
E2872:23	Section	01:10	Section facing northwest (063)
E2872:24	Section	01:10	West facing section of cut (049) in Area 4
E2872:25	Section	01:10	South-west facing section of posthole (100)
E2872:26	Section	01:10	West facing section of cut (014) Area 4
E2872:27	Section	01:10	Post-ex of section in Slot 2 (012) facing north east
E2872:28	Plan	01:20	Post-ex plan of (014) Area 4
E2872:29	Plan	01:20	Post-ex plan of (049) Area 4
E2872:30		01:10	Mid-ex of (149) Facing north
E2872:31	Section	01:10	Mid-ex of (149) facing south

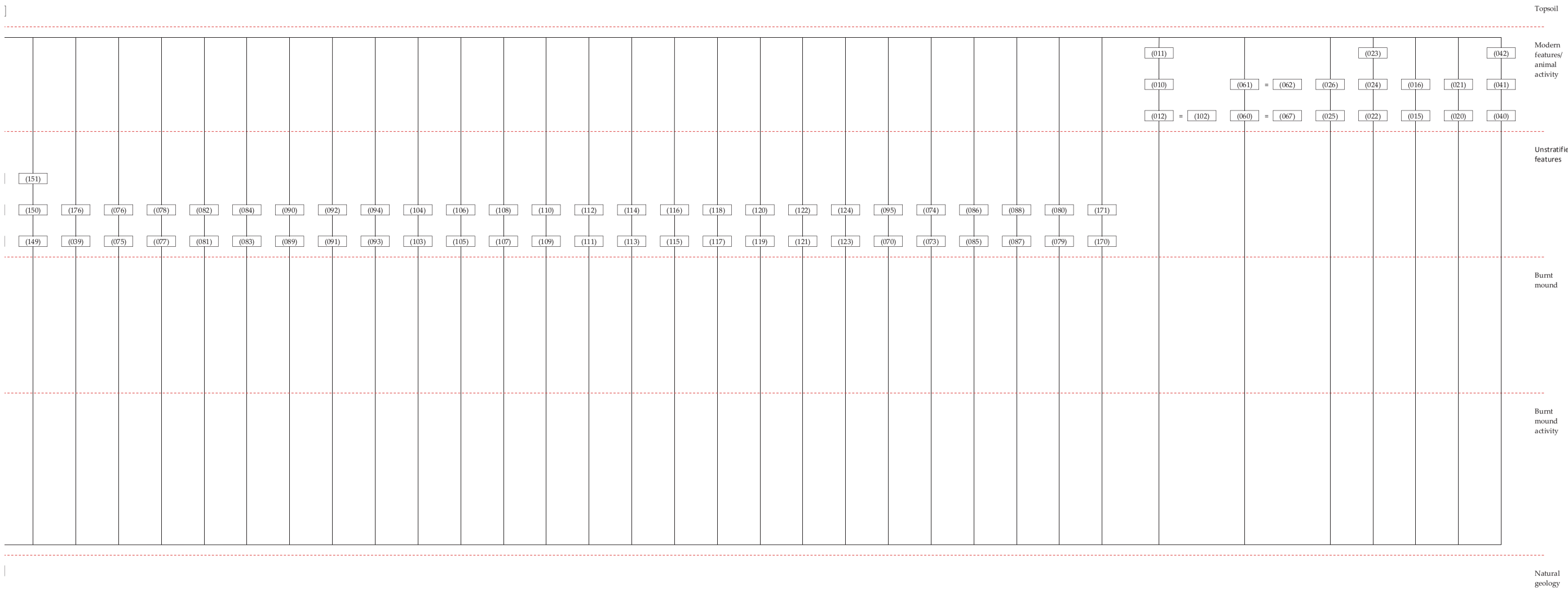
Drawing No.	Type	Scale	Description
E2872:32	Section	01:10	Mid-ex of (149) facing east
E2872:33	Section	01:10	Mid-ex of (149) facing west
E2872:34	Plan	01:50	Post-ex plan of E2872
E2872:35	Section	01:10	Southeast facing section of spread (017)

Appendix 6.1 - Site Matrix for Site E2872

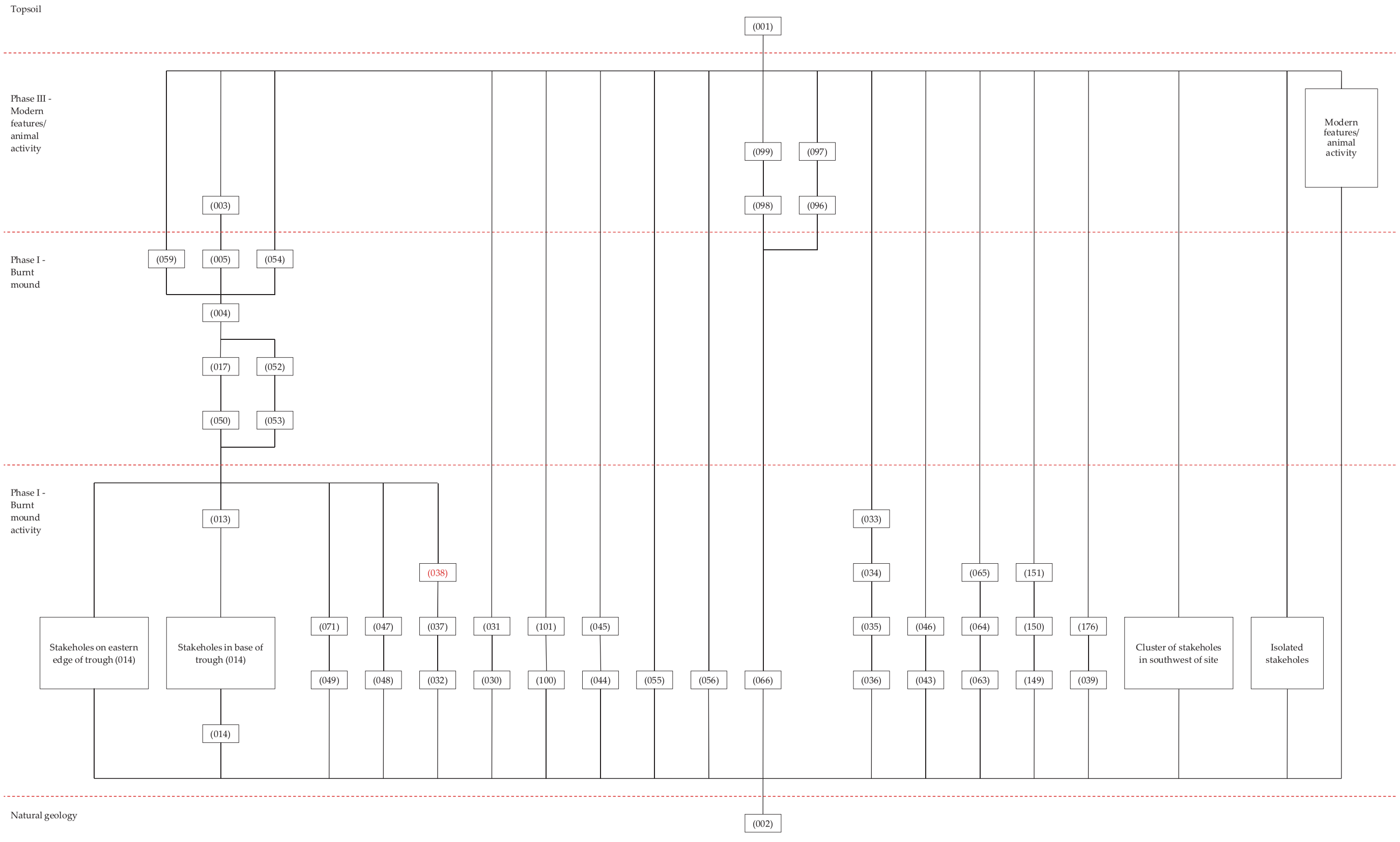


(038) = 2860 - 2490 cal BC

Appendix 6 .1 - Continued

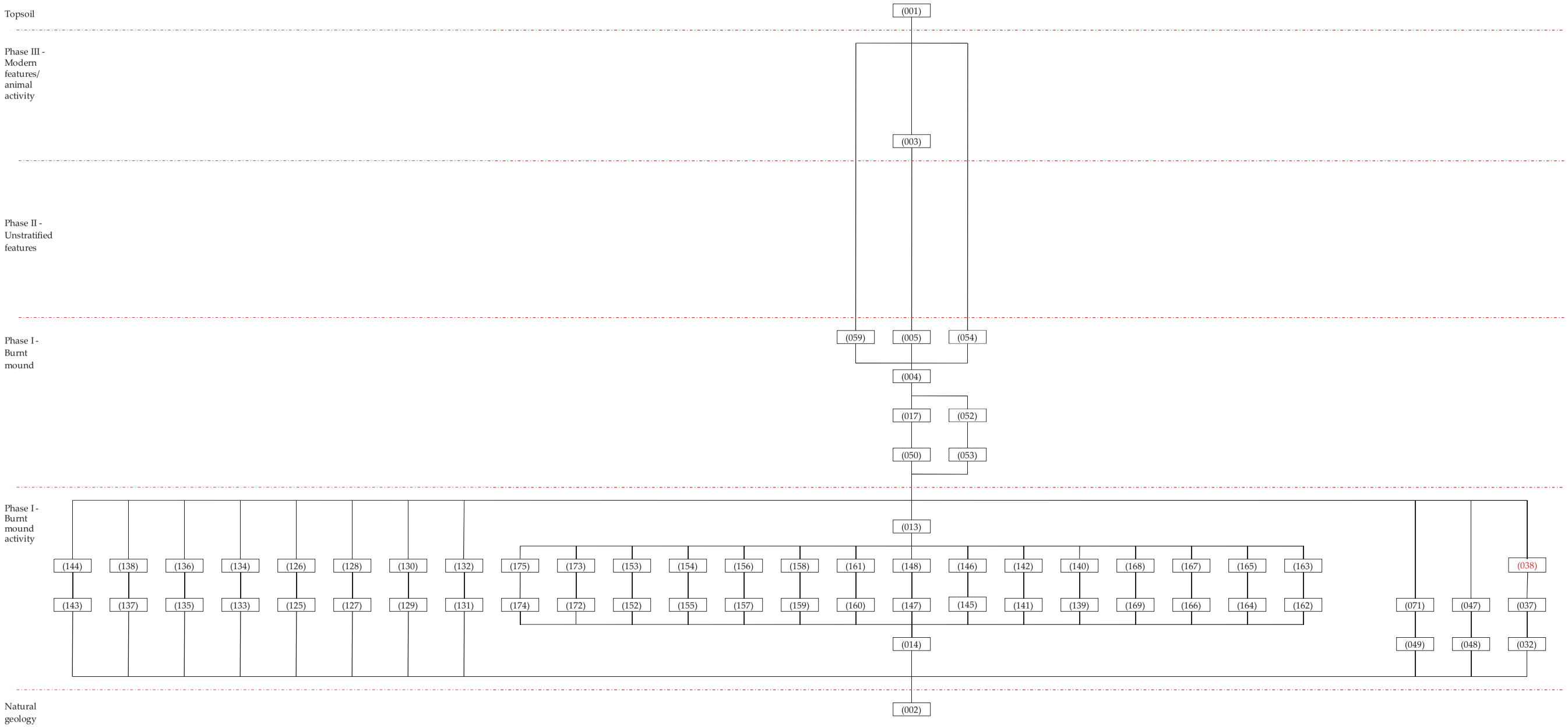


Appendix 6.2 - Compressed Site Matrix for Site E2872



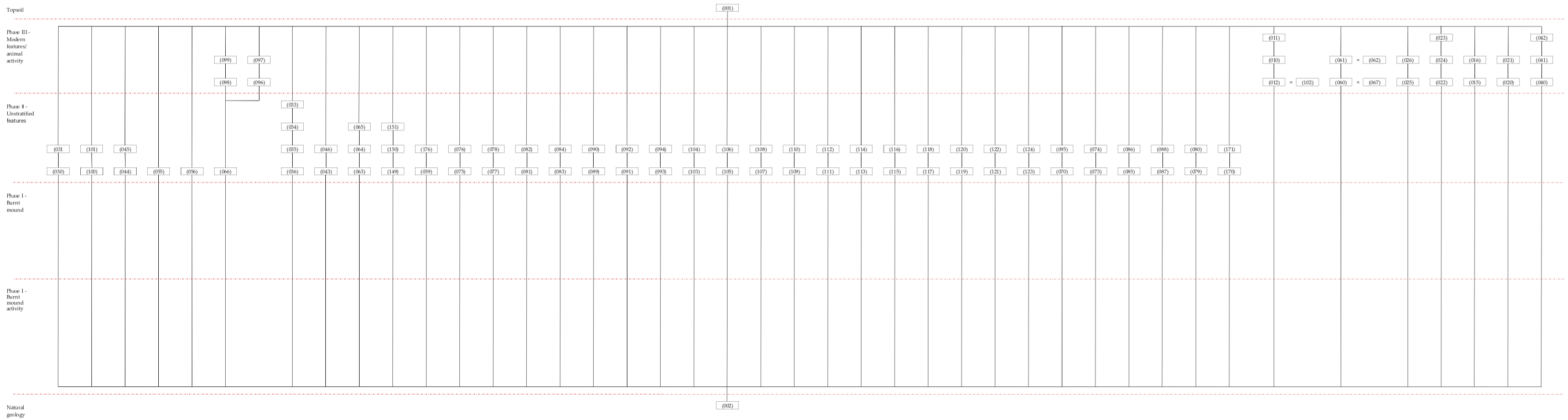
(038) = 2860 - 2490 cal BC

Appendix 6.3 - Site Matrix for Site E2872 (Burnt mound and associated features)



(038) = 2860 - 2490 cal BC

Appendix 6.4 - Site Matrix for Site E2872 (Non burnt mound features)



Appendix 7 – Palaeoenvironmental samples report for E2872, Ballymount, Co. Kildare
By: Karen Stewart

Introduction

Eighty environmental samples were taken during excavation of Site E2872 at Ballymount, Co. Kildare. The site consisted of a burnt mound, pits, stakeholes and a trough and samples were taken from all these feature types in order to build up a comprehensive picture of the economy and environment of the site. Forty-two of these samples were processed in order to recover any palaeoenvironmental or artefactual material that might 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).

Results

The results are summarised below in Tables 2 (Composition of flots) and 3 (Composition of retents). All plant material was preserved by charring.

Sample 074 was found to be devoid of any material of archaeological significance and has thus been recorded as 'archaeologically sterile'.

Generally, the range of material and the concentrations of material recovered were quite low (see Tables 2 and 3).

Wood charcoal
Wood charcoal was recovered from every sample not found to be archaeologically sterile. The volumes of charcoal recovered ranged from rare (+) to abundant (++++), but was generally in a abraded and fragmented condition. Only four samples (039, 040, 016 and 019) contained charcoal that was well preserved enough to undertake species ID for AMS (Accelerated Mass Spectrometry) dating.

Other material
Very low concentrations of unburnt bone were recovered from sample 042. This is discussed in the Faunal remains report (Appendix 9).

Worked stone was recovered from sample 047 and this is discussed in the Lithics report (Appendix 11).

Radiocarbon date results

Radiocarbon dating was undertaken by Gordon Cooke 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. The results are presented in Table 1.

Discussion

Most of the samples were taken from pits, stakeholes, a posthole, a trough feature and spreads and deposits of burnt mound related nature.

The charcoal recovered was very fragmented and abraded and this is understandable given the nature of spreads associated with *fulachta fiadh*, as burnt stone and charcoal is deposited on the surface. The typical location of *fulachta fiadh* next to water sources may also be a factor in the abrasion of charred plant material as the rising and lowering of the water table over time can abrade even buried charcoal, though as this site was situated on a slope, this may have had less of an impact than is usual on these sites. The absence of any archaeobotanical material other than charcoal from *fulachta fiadh* sites is well documented (O'Neill 2000) and this site would seem to fit into that pattern. It is also comparable to other sites in the locality such as at Site E2869 in the townland of Inchaquire, Co. Kildare, where again no archaeobotanical material other than charcoal was recovered.

Samples 019, 032, 033, 042, 047, 057 and 059 were taken from burnt spreads and burnt mound material and accordingly, they were all found to contain charcoal. However, in all cases the concentrations of material were quite low, which is less usual for these feature types. It may be the case that the aspect of the site, on a slope, was a factor in the lack of material, with some perhaps being washed downslope, following initial deposition.

Samples 016, 017, 039 and 040 were all taken from the fills (037) and (039) of pit (032) related to the burnt mound. The charcoal quantities from pit (032) were in general low, with the exception of sample 039, taken for the upper fill (038). A fragment of charcoal from this sample, identified to species as hazel, was selected for radiocarbon dating and returned a date of 2860 - 2490 cal BC (2 σ) (SUERC – 27197), placing the activity of the activity on site in the Late Neolithic Age.

Samples 050, 052 – 053, 064 – 088 were taken from stakeholes (068), (057), (079), (129), (131), (133), (135), (137), (139), (141), (143), (145), (147), (152), (155), (157), (159), (160), (162), (164), (166), (169), (170), (172) and (174) in the base or at the edge of trough (014). These were all found to be either archaeologically sterile or to contain very low concentrations of charcoal. In all these cases, the charcoal was very abraded and in very small fragments. It is unlikely that the charcoal recovered from these features represents the stakes that may once have been present, as the level of abrasion and fragmentation present is unlikely to have occurred *in situ*.

Samples 002, 013 and 028 were taken from fills (013), (033) and (047) of through (014), pit (036) and pit (048), respectively. Again, although the volumes of charcoal from these ranged from occasional (++) to moderate (+++), the condition of the fragments were abraded and poor.

Hazel is light demanding and cannot tolerate waterlogged or acidic conditions (Stuijts 2005 p 139). It is compatible with marginal woodland situations, close to a reliable water source and this habitat type is consistent with that commonly associated with burnt mound activity. Hazel also produces good fire wood (Stuijts 2005 p 140).

Given the relatively low quantities and the fragmented and abraded nature of the paleoenvironmental material recovered from these samples, it is not possible to deduct any further information on the receiving environment and the activity associated with the site, other that to say that hazel wood could have been at least one of the resources used for fuel in relation to the burnt mound activity. Further analysis on the charcoal species composition would not be warranted, due to the poor preservation of the material.

Conclusions

The palaeoenvironmental material recovered at this burnt mound site is typical of its contemporary site types in the region and consisted solely charcoal, which in most cases were highly fragmented and abraded.

Hazel wood could have been one of the fuel sources utilised as part of the activity on the site

References

Cappers R. T. J., Bekker R. M. and Jans, J. E. A. 2006 *Digital seed atlas of the Netherlands* Barkhuis Publishing and Groningen University Library, Groningen.

Kenward, H. K., Hall, A. R. and Jones, A. K. G 1980 'A tested set of techniques for the extraction of plant and animal macrofossils from archaeological deposits', *Science and Archaeology* Vol. 22, 3-15.

O'Neill, J. 2000 'Just another *fulacht fiadh* story', *Archaeology Ireland* Vol. 14 No.2

RADIOCARBON CALIBRATION PROGRAM* CALIB REV5.0.2 Copyright 1986-2005 M Stuiver and PJ Reimer. *To be used in conjunction with Stuiver, M., and Reimer, P.J., 1993, *Radiocarbon*, 35, 215-230.

Reimer, P.J., Baillie, M.G.L., Bard, E., Bayliss, A., Beck ,J.W., Bertrand, C., Blackwell, P.G., Buck, C.E., Burr, G., Cutler, K.B., Damon, P.E., Edwards, R.L., Fairbanks, R.G., Friedrich, M., Guilderson, T.P., Hughen, K.A., Kromer, B., McCormac, F.G., Manning, S., Bronk Ramsey, C., Reimer, R.W., Remmele, S., Southon, J.R., Stuiver, M., Talamo, S., Taylor, F.W., van der Plicht, J. and Weyhenmeyer, C.E. 2004 'IntCal04 Terrestrial radiocarbon age calibration, 26 - 0 ka BP', *Radiocarbon* Vol. 46, 1029-1058

Stewart, K. 2009 'Palaeoenvironmental samples report for Inchaquire, Co. Kildare E2869', in R.Hanbidge 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 E2869, in the townland of Inchaquire, Co. Kildare.* Unpublished Report by Headland Archaeology (Ireland) Ltd for Kildare County Council and the National Roads Authority.

Stuijts, I. 2005 'Wood and charcoal identification', in Gowen M., O'Neill J. and Philips M. (eds) *The Lisheen Mine Archaeological Project 1996-8*. Worldwell Ltd, Bray,137-185.

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
E2872	SUERC – 27197	Context 038 Sample 039	Hazel charcoal	-27.2	4085 +/- 30	2840 – 2810 cal BC	11.4	2860 – 2800 cal BC	17.8
								2760 – 2720 cal BC	5.4
						2670 – 2570 cal BC	56.8	2700 – 2560 cal BC	66.6
								2530 – 2490 cal BC	5.6

Table 1 - Results of radiocarbon dating

Context number	Sample number	Total flot vol. (ml)	Charcoal			Comments
			Qty	Max size (cm^3)	AMS	
033	013	5	++	0.2		
038	017	5	++	0.3		
004	019	15	+++	0.5		
047	028	40	+++	0.5		
005	032	100	++++	0.4		
017	033	40	++	0.1		
038	039	100	++++	2	*	
038	040	50	++++	2	*	
055	042	40	+++	0.4		
069	050	15	+++	0.1		
059	052	40	+++	0.4		
058	052	5	++	0.5		
053	057	30	++	0.4		
126	064	2	+	0.3		
128	065	5	++	0.1		
130	066	5	++			
132	067	5	+	0.1		
134	068	5	++	0.2		
136	069	3	++	0.2		
138	070	2	+	0.2		
142	072	1				Archaeologically sterile
144	073	5	+	0.5		
146	074	1				Archaeologically sterile
159	076	1				Archaeologically sterile
154	077	2	+	0.2		
165	082	1	+	0.1		
167	083	2	++	0.2		
168	084	2				Archaeologically sterile

Table 2 – Composition of flots

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant

* = sufficient sized charcoal for identification and AMS dating

Context number	Sample number	Retent vol. (L)	Context/ Sample description	Wood charcoal		Unburnt bone	Worked Stone	Comments
				Qty	AMS			
013	002	0.4	Fill of trough (014)	+++				
033	013	0.3	Top fill of pit (036)	++				
037	016	0.4	Basal fill of pit (032)	+	*			
038	017	0.4	Upper fill of pit (032)					Archaeologically sterile
004	019	0.3	Spread of fulacht material	+	*			
047	028	0.15	Fill of pit (048)	++				
005	032	1	Spread of fulacht material, similar to (004)	+++				
017	033	0.15	Burnt mound	+				
038	039	1	Upper fill of pit (032)	++++	*			
038	040	0.1	Upper fill of pit (032)	+				
055	042	0.4	Burnt spread	++		+		
056	047	0.4	Burnt spread	+			+ flint	
069	050	0.01	Fill of stakehole (068)					Archaeologically sterile
058	052	0.1	Fill of stakehole (057)	+				
074	053	0.08	Fill of stakehole (057)					
053	057	0.6	Burnt mound	+				
052	059	0.2	Burnt mound	+				
126	064	0.1	Fill of stakehole (125)	+				
128	065	0.3	Fill of stakehole (127)	++				
130	066	0.01	Fill of stakehole (129)	+				
132	067	0.3	Fill of stakehole (131)	++				
134	068	0.2	Fill of stakehole (133)	+				
136	069	0.02	Fill of stakehole (135)	+				
138	070	0.02	Fill of stakehole (137)	+				
140	071	0.03	Fill of stakehole (139)					Archaeologically sterile
142	072	0.2	Fill of stakehole (141)	+				
144	073	0.3	Fill of stakehole(143)	+				

Context number	Sample number	Retent vol. (L)	Context/ Sample description	Wood charcoal		Unburnt bone	Worked Stone	Comments
				Qty	AMS			
146	074	0.01	Fill of stakehole (145)					Archaeologically sterile
148	075	0.1	Fill of stakehole (147)	+				
153	076	0.0002	Fill of stakehole (152)	+				
154	077	0.1	Fill of stakehole (155)	+				
156	078	0.02	Fill of stakehole (157)					Archaeologically sterile
158	079	0.1	Fill of stakehole (159)	+				
161	080	0.05	Fill of stakehole (160)	+				
163	081	0.05	Fill of stakehole (162)	+				
165	082	0.02	Fill of stakehole (164)	+				
167	083	0.3	Fill of stakehole (166)	+				
168	084	0.01	Fill of stakehole (169)	+				
171	085	0.1	Fill of stakehole (170)	+				
173	086	0.03	Fill of stakehole (172)	+				
175	087	0.05	Fill of stakehole (174)	+				
080	088	0.002	Fill of stakehole (079)					Archaeologically sterile

Table 3 – Composition of retents

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant

* = sufficient sized charcoal for identification and AMS dating

Appendix 8 – Waterlogged wood from Ballymount E2872, identification of species and worked wood analysis
By Simon Gannon

Introduction

The wood pieces were obtained from the excavated site of Ballymount, County Kildare, Licence No. E2872. The wood was analysed after removal from the site and a period in storage.

The wood comprised seven separate items of charred and un-charred wood from two contexts within the site (a burnt mound with associated features). All items were analysed for identification of species and six pieces were additionally assessed for wood technology.

Study of taxa and the characteristics of wood technology may assist in the reconstruction of the local, contemporary environment, use of woodland resources and aspects of ancient woodworking and construction.

Identification of species

The results are summarised in Table 1.

Methodology
Optimal portions of wood were removed from the various samples. These portions were then sectioned across the transverse and, where required, across radial longitudinal and/or tangential longitudinal plains. Identifications were made by microscopic examination of between x10 and x400. To allow for identification of roundwood, heartwood, and sapwood, overall age related structural elements of the pieces were also considered. Probable branchwood was recorded in the case of observed tension wood and/or the presence of microscopic anatomical characteristics indicative of branchwood. 100% identification was made of all samples including the bulk samples which provided limited numbers of identifiable quality material.

Reference material comprised samples of wood taxa from the National Botanic Gardens, Glasnevin and the reference publications (Schweingruber 1990, Hather 2000).

Identifications
Classification follows that of *Flora Europaea* (Tutin *et al* 1964-80). Anatomical characteristics do not allow for identification of individual species in many cases. Several species belong to groups of species, species of genera, of sub-families and of families that cannot be separated anatomically (Hather 2000).

Based on anatomy the identifications were made to the highest level possible and are consistent with the following taxa or groups of taxa.

Broadleaf taxa
Corylaceae. *Corylus* spp., hazels.
Fagaceae. *Quercus* spp., oaks.
Ulmaceae. *Ulmus* spp., elms.

Taxa in site context
Sample 034. Context (004).

Non-identified. Indeterminate portion.

Sample 035. Context (038).
Oak (*Quercus*). Tangential portion.

Sample 036. Context (038).
Elm (*Ulmus*). Indeterminate portion.

Sample 037. Context (038).
Hazel (*Corylus*). Indeterminate portion.

Sample 038. Context (038).
Hazel (*Corylus*). Indeterminate portion.

Sample 039. Context (038).
Hazel (*Corylus*). Roundwood.

Sample 040. Context (038).
Hazel (*Corylus*). Indeterminate portion.

From the taxa groups discernable from anatomical study it is possible that a narrow range of species and, occasionally, one or two species can be indicated with a degree of confidence due to established factors, principally the native status of species and the history of introduction of species by people (Ellenberg 1988, Hather 2000, Huntley and Birks 1983, Mitchell 1995, Peterken 1996, Scannell and Synott 1987).

At this site the identified taxa belong to the range of species present in the native Irish flora and from these the following species may be inferred. Elm, the native species is *Ulmus glabra,* wych elm, leamhán sléibhe. Hazel, there is a single native species, *Corylus avellana,* coll. Oak, pedunculate oak, *Quercus robur*, dair ghallda and sessile oak, *Quercus petraea*, dair ghaelach are generally considered to be the native variants although there is some discussion as to whether *robur* occurred before introduction by man. (*cf.* Baillie and Brown 1995).

Worked Wood
The results are summarised in Table 1.

Methodology
In all cases the wood was cleaned and the various surfaces of each piece were examined for evidence of the possible processes of manufacture: felling, bucking, conversion, intentional breaking, final shaping by tools or by hand. Much of the woodwork found on recovered archaeological wood is implied by the evident alteration of surfaces rather than directly by the retention of tool marks. Recording was by photograph and drawing to scale of each piece of wood with a description of each surface of each piece and 1:1 scale drawing of all distinct tool marking.

Worked wood pieces

All of the wood pieces were found in a broken state and all but one with considerable erosion to surfaces.

Sample 034. Context (004): Non-identified. 74 x 23 x 8 mm. This short, broken piece had the best preservation of exterior surface but had a distorted internal anatomy that prevented a secure identification as to species. An indeterminate portion of wood with no tool marks or evidence of wood working.

Sample 036. Context (038): Elm (*Ulmus*). Approximately 500 x 80 x 10 mm. A thin, charred, broken, eroded and indeterminate portion. This piece was severely eroded with no surface preservation or structural integrity and could not be lifted. There are no tool marks or evidence of wood working to suggest use of this item.

Sample 037. Context (038): Hazel (*Corylus*). Approximately 500 x 100 x 10 mm. A thin, charred, broken, eroded and indeterminate portion. This piece was severely eroded with no surface preservation or structural integrity and could not be lifted. There are no tool marks or evidence of wood working to suggest use of this item.

Sample 038. Context (038): Hazel (*Corylus*). Approximately 500 x 100 x 7mm. A thin, charred, broken, eroded and indeterminate portion. This piece was severely eroded with no surface preservation or structural integrity and could not be lifted. There are no tool marks or evidence of wood working to suggest use of this item.

Sample 039. Context (038): Hazel (*Corylus*). Approximately 7 mm thick. A charred roundwood portion in small fragments with no tool marks or evidence of wood working.

Sample 040. Context (038): Hazel (*Corylus*). Approximately 7 mm thick. A charred indeterminate portion in small fragments with no tool marks or evidence of wood working.

Discussion and Conclusion

The woodland local to the site would have contained a number of woody species not represented in the samples and may have been a typical mixed oak woodland with a variety of trees and shrubs that in this case also included hazel and wych elm. The state of preservation of the wood from context (038) suggests that they were under erosive conditions for a prolonged period. This may have been a matter of simply being open to the elements but not necessarily in the final depositional context. The wood piece from context (004) was un-charred and did not undergo similar erosion. Although there is no direct evidence of use of the wood from this site there are many precedents as archaeological artefacts for the species involved. The wood pieces are mainly hazel, which does not produce wood of the right size for planks or any substantial structural timber and is typically used as small roundwood, often providing straight lengths suitable for a variety of purposes and very common in ancient structures, as at Mountdillon Bogs, Co. Longford (Raftery 1996). Hazel was often used in the production of stakes and there were a substantial number of stakeholes found at Ballymount. Elm, on the other hand, is not often found in archaeological contexts, although a common woodland species prior to episodes of severe decline, as at 3800 BC onward, it is inherently less useful than oak in most circumstances. Elm can provide structural timber, however, as at Lough Gur, Co. Limerick, for example, where, alongside ash, it was used in later Bronze Age building (Cleary 1995). The use of oak has been found to be commonplace throughout archaeological and historical periods, often as structural timber. In regard to *fulacht fiadh*, an example at Peter Street, Waterford had a trough

structure of oak uprights and planking (Walsh 1990). It is also possible that the wood, being without preserved woodworking evidence, and especially in the case of the charred wood, may simply have survived use as firewood.

Sample number	Context number	Item size mm	Conversion/portion	Woodworking/tool marks: tool use indicated	Taxa
034	004	74x23x8	indeterminate	none, not indicated	*Non-identified*
035	038	350x57x10mm	tangential	n/a	*Quercus*
036	038	525x136x136	indeterminate	none, not indicated	*Ulmus*
037	038	67x48x42	indeterminate	none, not indicated	*Corylus*
038	038	72x17x17	indeterminate	none, not indicated	*Corylus*
039	038	7mm thick	roundwood portion	none, not indicated	*Corylus*
040	038	7mm thick	indeterminate	none, not indicated	*Corylus*

Table 1 – Waterlogged and Charred Wood: Technology and Identification of Species

Bibliography

Baillie, M.G.L and D.M. Brown, 1995 *Some deductions on ancient Irish trees from dendrochronology* in Pilcher, J.R. and Mac an tSaoir, S. (eds) *Wood, Trees and Forests in Ireland.* Royal Irish Academy, Dublin.

Cleary, R.M. 1995 *Later Bronze Age Settlement and Prehistoric Burials, Lough Gur, Co. Limerick.* Proceedings of the Royal Irish Academy.

Ellenberg, H. 1988 *Vegetative Ecology of Central Europe.* Cambridge University Press, Cambridge.

Goldstein, M., G. Simonetti, and M. Watschinger, 1984 *Complete Guide to Trees and their identification*. MacDonald Illustrated.

Hather, J. G. 2000 *The identification of northern European woods*. Archetype, London.

Mitchell, F.J.G. 1995 *The dynamics of Irish Post-Glacial Forests* in Pilcher, J.R. and Mac ac tSaoir, S. (eds) *Wood, Trees and Forests in Ireland.* Royal Irish Academy, Dublin.

Peterken, G.F. 1996 *Natural Woodland, Ecology and Conservation in Northern Temperate Regions*. Cambridge.

Raftery, B. (ed.). 1995 *Trackway Excavations in the Mountdillon Bogs, Co. Longford, 1985-1991*. Crannóg Publications, Dublin.

Scannell, M.J.P. and Synott, D.M. 1987 *Census Catalogue of the Flora of Ireland*. Stationary Office, Dublin.

Schweingruber, F.H. 1990 *Microscopic Wood Anatomy*. Swiss Federal Institute for Forest, Snow and Landscape Research.

Tutin, T.G. *et al*. 1964-1980 *Flora Europaea.* 5 Vols. Cambridge University Press.

Walsh, C. 1990 'A medieval cooking trough from Peter Street, Waterford' in V. Buckley (ed.). *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell, Dublin.

Appendix 9 – Final report on the faunal remains from Ballymount, Co. Kildare (E2872)
By: Auli Tourunen PhD and Albína Hulda Pálsdóttir MA

Introduction

This report discusses the results animal bone analysis from Ballymount, Co. Kildare (E2872). Full archaeological resolution of the site revealed a burnt mound that consisted of seven spreads, a trough, stakeholes, a possible trough, pits, postholes and two ditches (Frykler 2009, 2). The animal bone specimens were recovered by hand-picking. The animal bones analyzed for this report derive from spreads of burnt mound material (004, 005), top fill (010) of ditch (012), burnt mound deposit (017), basal fill (034) of stone lined pit (036), fill (038) of pit (032) and fill (047) of pit (048) and spread deposits (055, 056).

Methodology

During the analysis each specimen was identified and recorded according to species, skeletal element, age and sex where possible. The animal bone reference collection located in Headland Archaeology Ltd, Unit 1 Wallingstown Business Park, Little Island, Co. Cork was utilized. The York System bone database program was used for recording (Harland *et al.* 2003). The category "large mammal" (lm) was used for specimens (mainly ribs and vertebrae) which could not be assigned to a species. The specimens categorized as large mammal are likely to belong to cattle; as red deer and horse were absent in the assemblage. The material was quantified by using the number of identified specimens (NISP) which was used as the main recording system for the whole assemblage. During the analysis pathological changes, carnivore and rodent gnawing, signs of burning and butchery marks were recorded. All data is stored in digital and written form in Headland Archaeology Ltd, Unit 1 Wallingstown Business Park, Little Island, Co Cork.

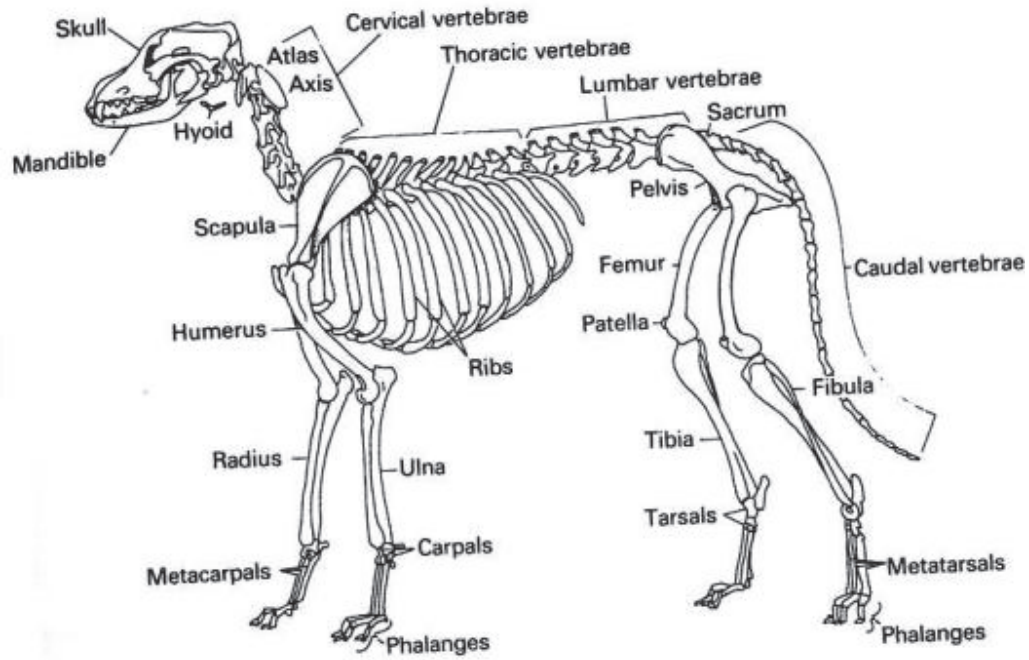


Figure 1 – Location on animal skeleton of terms referred to in text (Davis 1987, 54, in Reitz & Wing 1999)

Results

A total 77 bone specimens were analyzed from the site (Table 1). None of the bones from Ballymount were burnt, gnawed or showed signs of butchery or pathology. The bones derive from a modern ditch, deposits related to Late Neolithic burnt mound activity and a number of unstratified deposits. During the excavations some burrowing was noticed and the rabbit bone in the spread of burnt mound material (004) is likely to be intrusive. A number of bones were recovered from other non-archaeological contexts related to animal burrowing (007, 026, 027, 029) this included a rabbit skull, bird, dog and sheep bones which all looked recent and have not been included in the report.

Phase	*Context*	*Cattle*	*Pig*	*Rabbit*	*Large mammal*	*Unidentified*	***Total***
Burnt mound	004	1		1			2
Burnt mound	005		1				1
Modern	010	1					1
Burnt mound	017	3					3
Unstratified	034	21			2	31	54
Burnt mound	038	1	5			1	7
Burnt mound	047					3	3
Unstratified	055				1	4	5
Unstratified	056	1					1
	Total	28	6	1	3	39	**77**

Table 1 – The distribution of specimens in different contexts (NISP)

Late Neolithic burnt mound activity A total of 16 bones from pig, cattle and rabbit along with unidentified fragments were recovered from the burnt mound phase (Table 2). The fact that six pig bones and five cattle bones were identified is interesting as cattle is usually the dominating species in Irish material but given the very small size of the assemblage little can be read into this.

Context	*Cattle*	*Pig*	*Rabbit*	*Unidentified*	***NISP***
004	1		1		2
005		1			1
017	3				3
038	1	5		1	7
047				3	3
Total	5	6	1	4	**16**

Table 2 – The species present in the burnt mound assemblage (NISP)

A single fragmented cattle molar and a complete rabbit radius were found in spread of burnt mound material (004). In spread (005) of burnt mound material one pig incisor was recovered 005. A cattle femur and metacarpal, broken in many pieces, along with a cattle molar were found

in burnt mound deposit (017). In fill (038) of pit (032) five unworn mandibular pig teeth were recovered along with a cattle humerus in several pieces. Hazel sample 39, context (038) returned a radiocarbon date of 2700 - 2560 cal BC (2δ) SUERC-27197. Fill (047) of pit (048) contained only unidentifiable bone fragments. Due to the small sample size little can be ready into the element distribution for the burnt mound assemblage (Table 3).

Context	*Element*	*Cattle*	*Pig*	*Rabbit*	*Unidentified*	***NISP***
004	Teeth	1				1
004	Radius			1		1
004 Total		*1*		*1*		*2*
005	Teeth		1			1
005 Total			*1*			*1*
017	Teeth	1				1
017	Metacarpal	1				1
017	Femur	1				1
017 Total		*3*				*3*
038	Teeth		5			5
038	Humerus	1				1
038	Unidentified				1	1
038 Total		*1*	*5*		*1*	*7*
047	Unidentified				3	3
047 Total					*3*	*3*
Total		5	6	1	4	**16**

Table 3 – Anatomical distribution of the sample

Modern material A single cattle femur distal fragment, unfused, was recovered from top fill (010) of ditch (012). It is the only bone recovered from the modern phase of Ballymount.

Unstratified material A total of 60 bones were recovered from unstratified contexts at Ballymount (Table 4).

Context	*Cattle*	*Large mammal*	*Unidentified*	***NISP***
034	21	2	31	54
055		1	4	5
056	1			1
Total	22	3	35	**60**

Table 4 – The species distribution in the unstratified material (NISP)

From basal fill (034) of stone lined pit (036) various cattle and large mammal bones were recovered representing the skull, forelimb and trunk. A large mammal shaft fragment along with unidentified fragments was found in spread deposit (055). A single cattle third mandibular molar, in a medium state of wear was recovered from spread deposit (055) (Table 5).

Context	*Element*	*Cattle*	*Large mammal*	*Unidentified*	***NISP***

Context	*Element*	*Cattle*	*Large mammal*	*Unidentified*	***NISP***
034	Skull	1			1
034	Mandible	1			1
034	Teeth	16			16
034	Thoracic vertebra		2		2
034	Humerus	1			1
034	Radius	1			1
034	Ulna	1			1
034	Unidentified			31	31
034 Total		*21*	*2*	*31*	*54*
055	Shaft		1		1
055	Unidentified			4	4
055 Total			*1*	*4*	*5*
056	Teeth	1			1
056 Total		*1*			*1*
Total		22	3	35	**60**

Table 5 – Anatomical distribution of the sample

Discussion

None of the bones from Ballymount were burnt but in general the preservation was rather poor. The complete lack of burnt bones is most likely explained by the fact that all the bones were recovered with hand picking. Bones often break into very small fragments when they are burnt and are mostly recovered with soil sieving. The lack of burnt material is therefore likely due to sampling bias rather than the inherent properties of the material. No signs of butchery or gnawing were seen in the material from Ballymount, this is probably due to the poor preservation of the specimens.

The only identified species, apart from rabbit which is probably intrusive, from the Late Neolithic burnt mound activity at Ballymount are pig and cattle. Due to the small sample size little can be ready into the element distribution for the burnt mound assemblage but the anatomical distribution includes most elements in the cattle skeleton; however, the elements of the trunk are not well represented. For pig the only elements present are teeth, this might be more indicative of the poor preservation at the site rather than initial site function as teeth preserve better than bone. Only one bone was recovered from the modern phase, a cattle femur fragment. No further conclusions about site function during the period can be drawn from this single bone specimen.

The assemblage from the three unstratified contexts containing bone was small but cattle was the only identified species. No conclusions about site function can be drawn from this material due to the small size of the assemblage and unknown date.

The bone material from Ballymount, Co Kildare is too small for conclusive comparison against other assemblages. However, some general observations can be made. In general sites from Neolithic tend to have very little preserved bone and most assemblages are too small to give unbiased information about animal exploitation (McCormick and Murray 2007, 21-23). Some Neolithic assemblages are dominated by cattle such the Neolithic contexts at Knowth but others

are dominated by caprines such as the assemblage from a house excavated at Tankardsdown, Co. Limerick (McCormick and Murray 2007, 21-23)

The presence cattle and pig bones at Ballymount as well as the lack of bones from the trunk is in accordance with previous results of animal bone analysis from Bronze Age burnt mound deposits (Tourunen 2008). The animal bone samples from burnt mound sites are usually relatively small. In a previous study it was found that the animal bones recovered from burnt mound sites have been connected especially with slaughter, primary butchery and meat preparation (Tourunen 2008, 40). In burnt mounds excavated in the Carlow/Kildare area such as Ballybar Lower (E 2618) Co. Carlow, Busherstown (E 2584) Co. Calrow and Johnstown (E 2586) Co. Carlow, cattle dominate the samples followed by horse, deer, pig and sheep or goat (Tourunen 2008). The material from Ballygawley (Site 1), Co. Tyrone is also dominated by cattle bones, however no horse bones were found in the identifiable portion of the assemblage and the proportion of pig and sheep or goat bones is higher than in the samples from Carlow and Kildare (Tourunen 2009). Possible local variation across Ireland has not been fully investigated. For example, in five burnt mound sites excavated in Co. Tipperary the only identified animal was sheep or goat (Stevens 2005, 326).

Context	*Sample*	*Species*	*Element*	*NISP*	*Side*	*Gt50*	*Proxfus*	*Distfus*	*Notes*	*Percent*	*Texture*	*Recovery*
004	018	rabbit	rad	1	l	1234	f	f	Intrusive?		2	hc
004	045	cow	isoteeth	1					max M, in 3 pieces			hc
005	051	pig	isoteeth	1					mand I			hc
010	062	cow	fem	1	l	9AB		u			2	hc
017	009	cow	isoteeth	1					max M			hc
017	020	cow	m/c	1	l	56			in numerous pieces, flaking, very large individual		4	hc
017	022	cow	fem	1	r	78AB		f	in 11 pieces		3	hc
034	015	cow	isoteeth	7					1 PM mand, 6 M frags			hc
034	015	cow	skull	1					pars petrosa		2	hc
034	015	unid	ui	5					one in 2 pieces		3	hc
034	024	cow	rad	1	l	125	f		in 2 pieces		3	hc
034	024	cow	ulna	1	l	C			in 2 pieces		3	hc
034	024	cow	hum	1	l	68		f	in 3 pieces		3	hc
034	024	lm	thor	1	b					10	3	hc
034	024	lm	thor	1	b		f		upper epi, in 2 pieces	30	3	hc
034	024	unid	ui	16							3	hc
034	025	cow	isoteeth	4					Mand 3 M and 1 PM - all from same jaw(r)? M3 wear stage f			hc
034	025	cow	mand	1	r	2					4	hc
034	025	unid	ui	9					pieces from mandible?		4	hc
034	026	cow	isoteeth	5					3 M max, 2 PM max, all probably from the same jaw			hc
034	026	unid	ui	1					piece of jaw?		3	hc
038	023	pig	isoteeth	5					unworn mand teeth: 2 I, PM and M, little worn M1 (c).			hc
038	023	unid	ui	1							3	hc

Context	*Sample*	*Species*	*Element*	*NISP*	*Side*	*Gt50*	*Proxfus*	*Distfus*	*Notes*	*Percent*	*Texture*	*Recovery*
038	027	cow	hum	1	l	8			flaking, in numerous pieces		4	hc
048	029	unid	ui	3							4	hc
055	044	lm	sha	1					in 2 pieces		3	hc
055	044	unid	ui	4					one possibly antler piece (in 2 pieces)		3	hc
056	046	cow	isoteeth	1					mand M 3, r, (g)			hc

Table 6 – Complete list of animal bones

Key to complete list of animal bones:

Species
cow = cattle
lm = large mammal
rabbit? = rabbit
unid = unidentified

Elements
Mammals:
fem = femur
hum = humerus
isoteeth = isolated teeth
mand = mandible
m/c = metacarpal
rad = radius
sha = shaft
thor = thoracic vertebrae
ui = unidentified mammal

Side
r = right
l = left
b = both

GT50
For mammal and bird diagnostic zones, the York System (Harland et al. 2003) follows the Environmental Archaeology Unit's (EAU) recording protocol (Dobney, Jaques and Johnstone 1999) with minor re-coding.

Fusing proximal and distal
f = fused
u = unfused
fs = fusing

Texture
1 = excellent
2 = good
3 = fair
4 = poor

Recovery
hc = hand-picked
1 = sieved with 1 mm sieve

References

Davis, S. J. M. 1987. *The Archaeology of Animals*. New Haven, Yale University Press.

Dobney, K., Jaques, D. and Johnstone, C. 1999. 'A protocol for recording vertebrate remains from archaeological sites', *Reports from the Environmental Archaeology Unit, York*, 99/15.

Frykler, A. 2009. *N9/N10 Kilcullen to Waterford Scheme: Phase 3; Kilcullen to Carlow. Archaeological Services Contract No. 5- Resolution, Kilcullen to Moone and Athy Link Road. Preliminary Report on archaeological investigations at Site E2872, in the townland of Ballymount, Co. Kildare*. Unpublished client report byHeadland Archaeology (Ireland) Ltd. For Kildare County Council and the National Roads Authority.

Harland, J.F., Barrett, J.H., Carrott, J., Dobney, K., and Jaques, D. 2003. The York System: An integrated zooarchaeological database for research and teaching. *Internet Archaeology* 13.

McCormick, F. and Murray, E. 2007 *Knowth and the zooarchaeology of Early Christian Ireland.* Excavations at Knowth 3. Royal Irish Academy, Dublin.

Reitz, E. J. and Wing, E. S. 1999 *Zooarchaeology*. Cambridge manuals in archaeology. Cambridge University Press, Cambridge.

Stevens, P. 2005 'Faunal remains', in M Gowen, J Ó Néill & M Phillips (eds), The Lisheen Mine Archaeological Project, 1996–8, 326. Wordwell, Bray.

Tourunen, A. 2008 'Fauna and fulachta fiadh: animal bones from burnt mounds on the N9/N10 Carlow Bypass' in: J. O'Sullivan and M. Stanley (eds.): *Roads, Rediscovery and Research*. NRA Monograph 5, 37-44.

Tourunen, A. 2009 Final report on the faunal remains from Grange (Site 1), Co. Tyrone. Unpublished faunal report for Headland Archaeology (UK) Ltd.

Appendix 10 – Radiocarbon dates

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
E2872	SUERC – 27197	Context 038 Sample 039	Hazel charcoal	-27.2	4085 +/- 30	2840 – 2810 cal BC	11.4	2860 – 2800 cal BC	17.8
								2760 – 2720 cal BC	5.4
						2670 – 2570 cal BC	56.8	2700 – 2560 cal BC	66.6
								2530 – 2490 cal BC	5.6

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RADIOCARBON DATING CERTIFICATE

22 January 2010

Laboratory Code	SUERC-27197 (GU-20539)
Submitter	Heidi Jacobsen Headland Archaeology (Ireland) Ltd. Unit 1 Wallingstown Business Park Little Island Co. Cork, Ireland.
Site Reference	KCK06 E2872
Context Reference	38
Sample Reference	39
Material	Charcoal : Hazel
$\delta^{13}C$ relative to VPDB	-27.2 ‰
Radiocarbon Age BP	4085 ± 30

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.

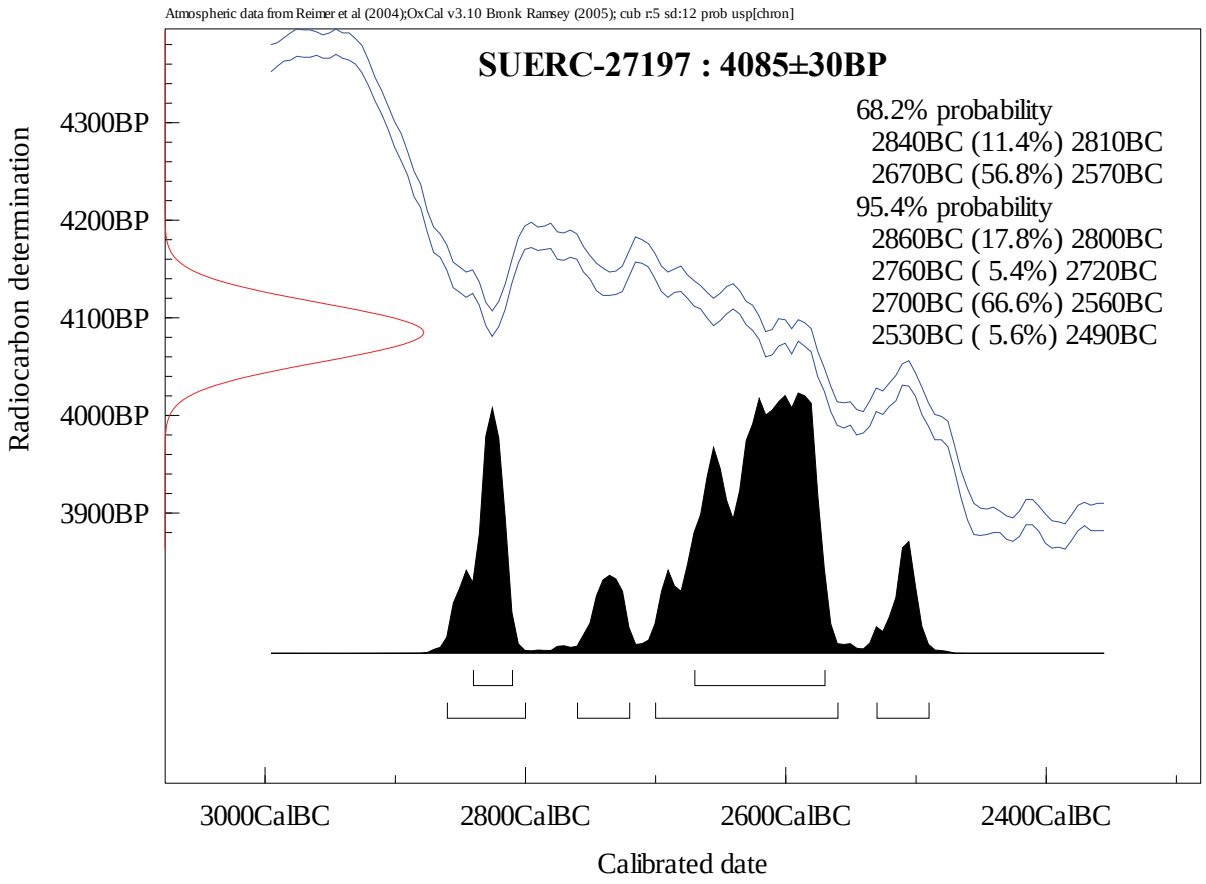
2. The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal3).

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 :- Date :-

Checked and signed off by :- Date :-

Calibration Plot



Appendix 11 – The lithic assemblage from Ballymount, Co. Kildare (E2872)
By: Maria Soledad Mallia-Guest

Introduction

A total of eight lithic finds were recovered during archaeological resolution of site E2872 (Ballymount, Co Kildare). The site was situated east of Narraghmore bog and comprised a kidney-shaped burnt mound deposit with associated troughs and pits. A number of unstratified pits and post/stakeholes were also identified along with several features of post-medieval date. The knapped artefacts were recovered from the main burnt mound deposit, spreads, a pit and a stakehole, as well as the basal fill of a linear ditch. Apart from the single lithic find retrieved during post-excavation processing, no additional finds were recovered on site or during post-excavation works.
The nearby sites located in the neighbouring townland of Inchaquire and particularly within Ballymount townland – such as sites E2871, E2874 and E2873 – yielded substantial lithic assemblages suggesting an intense prehistoric occupation across the area.

Methodology

A macroscopic analysis of the components was carried out based upon a techno-typological approach following categories developed by Inizan *et al.* (1999). Further contextual background is provided by Woodman *et al*. (2006).
The artefacts were visually examined with the aid of an 8x hand lens, recorded and catalogued using Microsoft Excel 2003. No minimum size criterion was applied for artefact discard; therefore, any other lithic material that may have been retrieved during sample processing was incorporated to contribute to the assemblage integrity. The variables recorded include overall metric attributes (length, width and thickness), type of raw material, fragmentation, and artefact condition to determine if post-depositional, manufacture or use-damage was present.
In addition, when macroscopic evidence of use-wear was present, subsequent basic high-power micro-wear analysis was carried out using a reflective microscope at 200x magnification. The presence/absence of use traces such as micro-polish, motion striation and edge-scarring/rounding were also recorded.

The Assemblage

A total of eight finds (Table 1) were recovered on site E2872 in the townland of Ballymount (Co. Kildare). The finds were retrieved from the surface and several spreads (046), (056) including the main burnt mound deposit (004) as well as the fill of a stakehole (171), the basal deposit of a ditch (102), and the single fill (046) of a pit (043) extending beyond the site boundaries. The assemblage is dominated by flint with only one single chert find accounted for. All the specimens fall within the small/medium-small sized category (measuring less than 50 mm in length) and are complete but in variable surface condition (Table 1, Figure 1). The examples retrieved from the spreads appear to be in fairly good condition in comparison with those recovered from the fill of stakehole (170) and the ditch (012). The surfaces on the latter exhibit intense white patination and discolouration. Apart from the presence of slightly corticated surfaces, only two specimens display some cortex remnant (5-20%) on their dorsal surfaces. The artefacts can be further classified as a single retouched artefact, two blanks exhibiting edges with macroscopic use-damage and five debitage pieces.

Debitage

Debitage is the dominant category within the assemblage, comprising five pieces of unretouched knapping by-products (E2872:056:001, E2872:001:001, E2872:004:001, E2872:171:001, E2872:171:002). These finds were recovered from surface, the loosely compacted dark brown sandy clayey silt spread (056) and the main burnt mound deposit (004). Two of the flakes (E2872:171:001-002) were retrieved from the light yellowish brown clayey silt deposit (171) of a sub-circular stakehole located west of the main burnt mound.

The debitage pieces can be further classified as inner angular flakes, exhibiting at least one flake scar on their dorsal surfaces. The flakes measure less than 26 mm in length (Table 1, Figure 1) with only two examples, (E2872:171:002) and (E2872:004:001), exhibiting suitable dimensions as well as the presence of potential working edges to be considered blanks either for use or further modification.

All of the debitage pieces present their platforms/butts, none of them presenting evidence of preparation either by retouching or abrasion. Plain and non-differentiated platforms are the most frequent, followed by non-differentiated and cortical butts.

It would appear that both flakes retrieved within deposit (171) were detached from the same light grey, opaque flint core and also appear to exhibit slight patination and discolouration. The presence of yellow/orangish iron staining could well be indicative of discarded material within deposits subject to variable water table levels.

The remaining flakes, particularly the one recovered from the topsoil as well as the one retrieved from the burnt mound (E2872:004:001) presented weathered surfaces. On the contrary, the flake recovered from spread (056) upon environmental processing of the soil sample is in good condition with only a smashed proximal end, and could well represent a bipolar by-product.

Natural edge with macroscopic use-damage

This category consists of two artefacts displaying macroscopic use-wear in the form of micro-retouching and blunting on their edges. The finds were recovered from a loosely compacted silt hill wash deposit (046) of pit (043) located south of the burnt mound, as well as from the mid-orangey brown sandy silty clay basal layer (102) of a linear ditch (012).

Artefact E2872:046:001 consists of the only chert find recovered from the assemblage comprising a large inner angular flake measuring 50 mm in length (Table 1, Figure 1). The flake presents a slightly curved profile; a hinge termination as well as a slight concave edge at its lateral distal portion along which micro-retouching and notching was visually identified. Rounding of the working edge was also microscopically identified confirming the blank had been used without further modification. The flake is finely detached possibly by hard-hammer percussion judging by its technological attributes (pronounced bulb and ripples of percussion as well as bulbar/erailleur scar). The chert is a fine homogeneous dark grey variety presenting fine black banding with slight lighter grey discolouration and differential patination likely to have resulted from heat-exposure.

The damage present on the utilised flint artefact (E2872:102:001) is rather circumstantial given its very poor condition. The piece, which appears to be a primary flake displays a severe white patination and weathering all throughout with some micro-retouching and blunting identified at its distal end. The potential working edge is rather abrupt exhibiting a working angle over 70° and a slightly concave cross-section but regular outline in frontal view. This edge morphology would have suited the processing of slightly convex surfaces (*ie* wood planing).

Retouched Artefact

A single retouched artefact (E2872:066:001) was recovered form a light yellowish-brown clayey silt spread (066) extending beyond the site limits southwards of the main burnt mound (004). The artefact is made of a light buff-grey translucent flint measuring less than (40 mm) in length and presenting crushing on both distal and proximal/butt end suggesting that it had been detached by bipolar technique. The artefact exhibits a short series of semi-invasive, semi-abrupt inverse retouch. The series extends on the distal (ventral) end forming a working edge angled at 65°. Some cortication as well as cortex remnant is present on its right lateral side. The artefact can be classified as a distally retouched flake, which could have functioned as a convex end-flake scraper given the presence of macroscopic blunting and micro-retouching originated by use. However, only edge rounding was microscopically identified, with no striae pattern present that could indicate a transversal motion.

Discussion

The lithic assemblage recovered on site E2872, Ballymount Co. Kildare is dominated by a number of unretouched knapping by-products from which only two examples could have been potential blanks for use or further modification. With regards to modified pieces either by use or formal retouch, all of these appear to exhibit larger dimensions ranging between 30-50 mm which most likely did not present any hafting arrangement, or at least no macroscopic evidence of this was identified. A single retouched artefact was present on site, as mentioned above; this could have functioned as an end of flake convex scraper. The overall quality and extension of the retouch series as well as the absence of any diagnostic debitage pieces may indicate that there was scarce emphasis on *in situ* secondary technology; this is the shaping/thinning and edge trimming of artefacts. It is worth noting that most of the utilised flakes, blanks and the retouched artefact have been recovered south of the burnt mound, which could reflect the presence of a working area or surface extending beyond the site limits.

Both platform and bipolar reduction techniques seem to be present within the assemblage however given its undersized nature and the lack of substantially diagnostic debitage pieces, it is unclear if there was a preference of one technique over the other. Only one artefact (E2872:066:001) displays all the characteristic bipolar attributes: bashed ends, diffuse or absent bulbs, pronounced ripples of percussion running in opposed direction, etc. Bipolar technique consists of the placing of the nodule on a stationary anvil before reduction (Whittaker 1994) and becomes increasingly frequent from the Middle Neolithic and well through the Late Bronze Age. (O'Hare 2005).

Platform reduction, on the other hand, is mostly associated with earlier prehistoric assemblages (Woodman 1987). However, technological and morphological attributes should not be regarded as chronological markers *per se.* Raw material size, quality and availability are key factors in choosing a knapping technique. A secondary source of flint is represented by the local glacial till, which incorporates weathered nodules of small size and poor quality more efficiently reduced by bipolar technique. Additionally, flint can also be obtained from coastal localities as rolled beach pebbles (Woodman *et al.* 2006). Raw material provenance is therefore evident when observing the quality of the cortex remnant on the artefact surfaces. In this case, the luster, rolling and weathering of the cortex clearly contrasts with the 'chalky' concretions of those blanks derived from a primary source such as the Irish Northeast.

Chert on the other hand has a widespread distribution over the Irish landscape as it is associated with limestone deposits of Carboniferous date. The Carlow/Kildare area is dominated by sedimentary lithologies, including sandstone, conglomerate, bioclastic and massive limestone, mudstone and shale (GSI 2007)

It would appear however that the utilised chert flake here described derived from a dark variety of banded chert certainly present in the Midlands and very similar in texture, but not in colour or luster, to that commonly known as 'Festooned' or 'Derravaragh' chert (Mitchell 1972; Little 2008; Warren *et al* 2009). Examples of this distinctive variant, for which the primary sources are located in the Lough Derravaragh surroundings (Co. Westmeath) have been identified in the nearby site E2867 in the townland of Inchaquire, Co. Kildare as well as part of the substantial assemblage retrieved on the adjacent site E2873 within Ballymount townland (Mallia-Guest 2009a, b). Large chert blades and broad flakes appear to be associated with earlier technologies, particular in Late Mesolithic and Early Neolithic contexts.

Several sites along the N9/N10 roadtake have yielded evidence of the recycling of earlier lithic artefacts (Sternke 2008) reintroduced into Bronze Age contexts, such as the artefact from the burnt spread at Johnstown (E2575) (*ibid)* or the distally retouched form at site E2869 (Inchaquire, Co. Kildare) recovered from a metalled surface pre-dating the formation of the mound (Hanbidge 2009). Chert has also been the dominant raw material in several lithic assemblages retrieved along the road stretch such as large chert blades and flakes, recovered in Tinryland, Co. Carlow (E2589) dating to the Early Neolithic (O'Connell 2009). The material from Tinryland appeared to be the same dark greyish black with greyish swirls variant as the one retrieved on the site here discussed and the adjacent E2871(Ballymount/Blackrath Co. Kildare).

In this particular case, given the undersized nature of the assemblage as well as the partial exposure of the feature from which the chert artefact was recovered it is not possible to assert if the find was in its primary context of deposition indicating an earlier occupation of the site or if it is a reclaimed find reincorporated into a later context.

Unfortunately, as already pointed out by Sternke (2008) and Woodman *et a*l. (2006), the lithic material associated with burnt mounds or *fulachta fiadh* is usually scarce, minimally retouched and weathered or poorly preserved. The assemblage recovered at Site E2872 (Ballymount, Co. Kildare) also appears to have more emphasis on the use and discard of either ready to use blanks or minimally retouched artefacts. This trend seems to come forth in the Final Neolithic, a point at which a more *ad hoc* reduction strategy was beginning to emerge setting apart from platform technology to give way to fully bipolar assemblages dominating at the very earliest point in the Bronze Age (O'Hare 2005). The presence of both bipolar and platform technology by-products may be a reflection of this technological transition and appears in line with the radiocarbon determinations obtained from a posthole beneath the burnt mound which returned a date range of 2860 – 2490 cal BC (2σ) (SUERC – 27197)(Appendix 10).

References

Frykler, A. 2009 N9/N10 *Kilcullen to Waterford Scheme: Phase 3; Kilcullen to Carlow. Archaeological Services Contract No. 5 - Resolution, Kilcullen to Moone and Athy Link Road. Preliminary Report on archaeological investigations at Site E2872, in the townland of Ballymount, Co. Kildare.* Unpublished Report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

GSI Datasets Public Viewer 2007: Bedrock 500k Geology. *Geological Survey of Ireland.* http://spatial.dcenr.gov.ie/imf/imf.jsp?site=GSI_Simple. (Last accessed in August 2009).

Hanbidge, R. 2009 *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 E2869, in the townland of Inchaquire, Co. Kildare. Unpublished Report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority

Inizan, M.-L., M. Reduron-Ballinger, M. Roche, H. and J. Tixier 1999 *Technology and Terminology of Knapped Stone* 5. CREP, Nanterre

Little, A. 2008 *Between the wet and the dry: traditions of reoccupation, temporality and the social significance of life on an island during Mesolithic times.* Precirculated paper for 6th World Archaeological Congress-Dublin

Mallia-Guest, M. 2009a 'The lithic assemblage from Inchaquire, Co. Kildare (E2867)' *In* R.Hanbidge 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 E2867, in the townland of Inchaquire, Co. Kildare.* Unpublished Specialist Report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Mallia-Guest, M. 2009b 'The lithic assemblage from Ballymount, Co. Kildare (E2873)' *In* R.Hanbidge 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 E2873, in the townland of Ballymount, Co. Kildare.* Unpublished Specialist Report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Mitchell, G. 1972 `Some Ultimate Larnian Sites at Lough Derravaragh, Co. Westmeath'. *JRSAI* 102, 160-73

O'Connell, T.J. 2009 *N9/N10 Kilcullen to Waterford Scheme: Kilcullen to Powerstown. Archaeological Services Contract No. 4 - Resolution, Prumplestown to Powerstown. Final Report on archaeological investigations at Site E2589, in the townland of Tinryland, Co. Carlow*. Unpublished Report by Headland Archaeology (Ireland) Ltd. for Kildare County Council and the National Roads Authority.

Sternke, F. 2008 *The significance of the lithic assemblages from the archaeological excavations on the N9/N10 Kilcullen to Waterford Scheme (Kilcullen to Powerstown*). Unpublished Specialist Scheme Summary Report on behalf of Headland Archaeology (Ireland) Ltd. for Kildare County Council and The National Roads Authority.

Warren, G., Little, A. and M. Stanley 2009 `A late Mesolithic lithic scatter from Corralanna', *PRIA* Vol. 109C, 1-35 (doi:10.3318/PRIAC.2009.109.1)

Whittaker, J. 1994 *Flintknapping. Making and Understanding Stone Tools*. University of Texas Press, Austin.

Woodman, P. 1987 'The Impact of Resource Availability on Lithic Industrial Traditions in Prehistoric Ireland'. In P. Rowley-Conwy, M. Zvelebil and H.P. Blankholm (eds.): *Mesolithic northwest Europe: recent trends*, pp. 138-146. Department of Archaeology and Prehistory, University of Sheffield.

Woodman, P. C., Finlay, N. and E. Anderson 2006. *The Archaeology of a Collection: The Keiller-Knowles Collection of the National Museum of Ireland.* National Museum of Ireland Monograph Series 2. Wordwell, Bray.

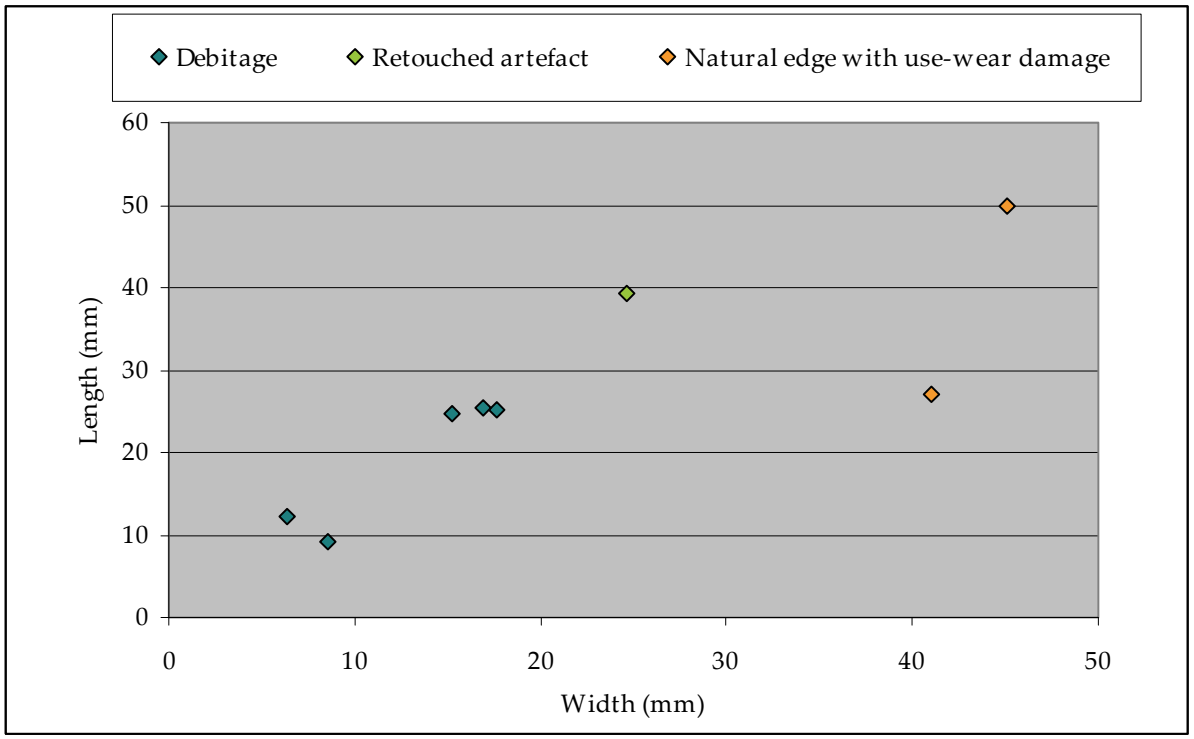


Figure 1 Length/width ratios for the lithic assemblage of site E2872, Ballymount, Co. Kildare

NMI Number	Raw Material	Type	Category	Length (mm)	Width (mm)	Thickness (mm)	State	Condition	Others	Cortex	Position of Retouch	Type of Retouch	Extension of Retouch	Type of use damage	Type of Platform	Preparation	Bulb	Colour
E2872:056:001	Flint	Inner flake	Debitage	12	6.4	1.5	C	Good	smashed proximal end	No					ND	N/A	ND	Dark buff green
E2872:046:001	Chert	Utilised flake	Natural edge with use-wear damage	50	45	8.1	C	Good	Slight discol.and patination burnt?	No				Rd	Plain	No	P	Dark greyish black, fine banding
E2872:001:001	Flint	Inner flake	Debitage	9.1	8.6	3.1	C	Poor	Heavily patinated and corticated	Yes 5%					Cort.	No	ND	Light greyish buff
E2872:004:001	Flint	Inner flake	Debitage	25	18	2.8	C	Fair	Weathered surface, slight longitudinal fracture and patination	No					Plain	No	P	Mid greyish buff
E2872:171:001	Flint	Inner flake	Debitage	25	15	5.6	C	Fair	Slight patination and sugary texture, crystalised on proximal end and slight longitudinal fracture	No					ND	No	P	Light grey opaque
E2872:171:002	Flint	Inner flake	Debitage	26	17	9.1	C	Fair	Slight discol., patination on proximal end, distal end presents cortex remnant	Yes 20%					Plain	No	P	Light grey opaque
E2872:066:001	Flint	Distally retouched flake	Retouched Artefact	39	25	8.5	C	Good	Patinated on distal and proximal ends, corticated on lateral end, slight yellowish discol.	No	UI	S-Ab 65º	Short S-I distal end	Bt, Rd no striae pattern	Plain	No	ND	Light buff grey transl.
E2872:102:001	Flint	Utilised flake	Natural edge with use-wear damage	27	41	13	C	Very Poor	Severely Patinated	No				Mr, Bt on frontal end	ND	No	ND	Light whitish grey

Key: C: complete, F: fragmented; Discol.: discolouration ND: non-differentiated, P: pronounced; D: diffuse; UI: Unifacial Inverse; S-I: Semi-invasive, Bt: Blunting; Rd: rounding; Mr: micro-retouch; S-Ab: semi-abrupt, Cort: cortical

Table 1 – Lithic assemblage from Ballymount, Co. Kildare (E2872).