

N11 RATHNEW TO ARKLOW ROAD IMPROVEMENT



**NMSR No.: E3229
SITE A022/043
NGR: 327863/184362
TOWNLAND: BALLYCLOUGH NORTH
COUNTY: WICKLOW**

FINAL REPORT

**ON BEHALF OF WICKLOW COUNTY COUNCIL
AND THE NATIONAL ROADS AUTHORITY**

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ABSTRACT

This site was located in the townland of Ballyclogh North, c. 11.50km northeast of Arklow town, Co. Wicklow. The archaeological excavation was carried out by Irish Archaeological Consultancy Ltd. on behalf of Wicklow County Council and the National Roads Authority in advance of the construction of the N11 Rathnew to Arklow Road Improvement.

The site was initially identified during archaeological testing carried out by IAC Ltd. under the same contract during July 2005. The testing revealed three burnt spreads in close proximity to each other. Area A was a low mound of black, sandy soil containing heat-fractured stones and charcoal. It measured 12.75m north-south by 20m east-west and was 0.30m in depth. Area B was located a short distance to the southeast of Area A and comprised a spread of black, sandy soil containing heat-fractured stones and charcoal. It measured 8.25m north-south by 8.25m east-west that was 0.07m in depth. Area C was located 7m east of Area A and consisted of a low mound of black, sandy soil containing heat-fractured stones and charcoal. It measured 26m north-south by 7m east-west and was 0.25m in depth. Subsequent excavation found that the burnt spreads in Areas A and B were ephemeral to the large burnt spread in Area C under which five pits, a preserved wooden platform as well as a wood lined trough and a posthole were found. The wood lined trough [C54] was used in the heating of water through hot stone technology. This resulted in the surrounding mound of burnt stones. The purpose of the pits is unclear. They may have been used as smaller troughs or “pot boilers” which were also used to boil water using hot stones or for the deposition of burnt mound material. These features were characteristic of *fulacht fiadh*/burnt mound sites. The excavation area measured 40m by 45m (1800m²).

A variety of specialist analysis was carried out on the materials and samples retrieved from the excavation at this site. Timber and charcoal analysis of the trough lining (C42) revealed that it was made up of a combination of half split oak (*Quercus spp.*) and alder (*Alnus glutinosa*) planks. The platform was constructed from oak (*Quercus spp.*) while an associated stake (C19) was made from ash (*Fraxinus excelsior*). A sample of oak from wood platform (C10) was sent for C14 dating and returned a two sigma radiocarbon date of 3000 +/- 52BP. This gave a 2 sigma calibrated date range of 1400–1050BC placing this activity in the middle Bronze Age period (WK20707, Appendix 2.2). Sixty struck flint pieces over 20mm in length were recovered from the site and these were generally found to date to the mid-late Neolithic. This assemblage includes 14 retouched artefacts, 40 flakes and 6 cores. It also includes 10 pieces of flint debitage (Sternke, Appendix 2.3). The discrepancy between the dates given from the Radiocarbon dating and lithic analysis may be a result of the site having had a long life and the platform having been one of the later features.

This site appears to be related to several other sites in the area as part of a complex of burnt mounds. This complex was made up of the present site (Site A022/043) and Sites A022/044, 045, 046, 047 and 048. The area around Site A022/046, which contained a double walled wicker lined trough, appeared to have been in use over a considerable period of time with evidence for early and middle Bronze Age as well as Beaker activity being recovered. Site A022/044 dated to the middle Bronze Age and Sites A022/045 and A022/046 dated to the later Bronze Age. Sites A022/048 and 049, at the northern end of this group of burnt mounds, were undated. This complex of burnt mound sites is evidence of intense activity in the middle and late Bronze Age. It is possible that associated settlement sites were located on the higher ground to the east and west of the CPO boundary.

The presence of the Neolithic lithic assemblage is not consistent with the radiocarbon date for the site which has given a middle Bronze Age date. This could imply that the lithic assemblage is associated with earlier Neolithic activity in the vicinity of this site.

The results of the excavation are not unexpected given the nature of the physical landscape and the archaeological landscape which shows several complexes of typologically similar sites to the north and the south.

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The archaeological excavation at Ballyclogh North, Co. Wicklow was carried out on behalf of Wicklow County Council and the National Roads Authority in advance of the construction of the N11 Rathnew to Arklow Road Improvement.

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1 INTRODUCTION

This final report provides comment and analysis on the excavation carried out in the townland of Ballyclogh North, Co. Wicklow (Figure 1) as part of an archaeological mitigation program associated with the N11 Rathnew to Arklow Road Improvement. Archaeological fieldwork was directed by Yvonne Whitty of Irish Archaeological Consultancy Ltd. (IAC Ltd.) and was funded by Wicklow County Council and the National Roads Authority.

1.1 Site location

This site was located in Ballyclogh North townland, Dunganstown parish and the barony of Arklow to the immediate west of the current N11, c. 11.50km northeast of Arklow (Wicklow OS sheet 36). The site details are:

- Site Ballyclogh North, Ministerial Direction No.: A022/043, NMS Registration Number: E3229. Route chainage (Ch) 7280-7350, NGR 327863/184362.

The site was identified in low-lying ground as a result of a test trenching exercise undertaken by IAC Ltd. under the same contract in July 2005 (Ministerial Direction No.: A022/006, Gill McLoughlin). The route was divided into 14 different test areas for the initial ground testing / assessment phase. Testing revealed three burnt spreads in close proximity to each other. Area A was a low mound of black sandy soil containing heat fractured stones and charcoal measuring 12.75m north-south by 20m east-west and was 0.30m deep. Area B was located a short distance to the southeast of Area A and was a spread of black sandy soil containing heat fractured stones and charcoal measuring 8.25m north-south by 8.25m east-west that was 0.07m deep. Area C was located 7m east of Area A and consisted of a low mound of black sandy soil containing heat fractured stones and charcoal measuring 26m north-south by 7m east-west that was 0.25m deep.

Subsequent excavation found the burnt spreads in areas A and B were ephemeral to one large burnt spread in Area C under which were a number of pits, a timber lined trough and a preserved wooden platform. These features are characteristic of Bronze Age *fulacht fiadh*/burnt mound sites. The excavation area measured 40m by 45m, totalling 1800m².

1.2 The scope of the project

The proposed N11 Rathnew to Arklow Road Improvement is located between the northern limit of the N11 Arklow By-pass in the townland of Ballinaskea and the southern limit of the N11 Newtownmountkennedy to Ballynabarney Road Improvement in the townland of Ballinaclogh, County Wicklow. It consists of approximately 16.3km of new dual carriageway, approximately 19km of new single carriageway local, regional and accommodation access roads, two grade separated interchanges, and several bridge/culvert river crossings. There are also a significant number of minor road realignments/modifications included in the scheme.

The route commences at the north end of the full width dual carriageway section of the N11 Arklow By-pass. It involves the widening of the existing N11 corridor on its east side as far as Scratenagh Cross Roads where it crosses the proposed mainline to run generally on-line with widening to the west side of the existing carriageway.

An overbridge is proposed immediately north of Scratenagh to allow local traffic from adjacent county roads to cross over the dual carriageway. Access to existing communities and properties adjacent to the existing N11 will be maintained by the provision of an all-purpose local access road which will run parallel to the proposed

dual carriageway. This all purpose road (to be called the R772) will utilise significant lengths of existing N11 carriageway, with new single carriageway constructed where required to complete the route.

The proposed dual carriageway alignment passes west of Jack White's Cross Roads and a grade-separated interchange is proposed at this location to provide local access from the all purpose road. Continuing north the alignment follows the line of the existing N11 to Kilmurry North where the preferred route then runs off-line to the east before crossing over the existing N11 at Ballinameesda Upper adjacent to Lil Doyle's Public House. It then swings to the northwest, off the line of the existing N11, passing between the townlands of Ballinameesda Upper and Ballinameesda Lower before sweeping northeast. Access will be maintained by the construction of three new underbridges where the proposed mainline crosses the existing side roads on the L5664 to Kilbride, the L5158 to Kilboy and the L1157 to Ballinameesda Upper.

To the north of Ballinameesda Upper the alignment runs parallel and to the west of the existing carriageway swinging from a northwest line at Ballinameesda Upper to a northeast direction at Roscath. This alignment avoids crossing the line of the existing N11 at the Tap which enables the existing N11 to be used as an all purpose road for local traffic between the Beehive and Jack White's.

North of Coolacork and Roscath the preferred route will run parallel with the west side of the N11 until it reaches the R751 and the 'The Beehive' junction. A second grade-separated interchange is proposed just to the west of 'The Beehive' junction. Thereafter the preferred route converges on the tie-in point with the south end of the N11 Newtownmountkenedy to Ballynabarney Road Improvement near Ballinaclogh.

1.3 Circumstances and dates of fieldwork

The excavations were undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve these sites by record.

Topsoil stripping of the area commenced on 31/03/2006. The order and date of the excavation is as follows:

- Cleaning back and pre-excavation planning commenced on 25/04/2006 with a team of 1 field director, 1 Supervisor, 7 assistant archaeologists and 3 general operatives.
- All features were subsequently fully excavated and recorded by hand, using the single context recording system with plans and sections being produced at a scale of 1:50 or 1:20 (sections were recorded generally at 1:10) and photographs where necessary. All works were carried out in agreement with the Project Archaeologist, the National Monuments Section of the Department of the Environment, Heritage and Local Government. Samples were taken of any environmental and dateable material.
- Excavation and recording of all features were completed by 09/06/2006.

The archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland. All excavation and post excavation works were carried out in consultation and agreement with the Project Archaeologist, the National Monuments Section of the DOEHLG and the National Museum of Ireland.

2 ARCHAEOLOGICAL BACKGROUND

2.1 Project Location and Site Topography

Wicklow is a coastal county in the southeast corner of Ireland. It has an area of 2025 square kilometres of diverse topography and 40km of coastline along the Irish Sea. The physical characteristics of the county have created two dramatically different environments, divided by a ridge of granite known as the Wicklow Mountains that extend south from Dublin Bay as far as Mount Brandon in Co Kilkenny. The soils of the county have developed on glacial materials deposited by successive glaciations. Generally, the soils in the county are fertile except for the peaty podzols, notable in the central upland areas (Stout 1994). The lowland coastal plains with fertile glacial soils are on the east whilst the peaty podzols in the upland mountainous region of the northwest and southwest pose a more isolated terrain. The Ballinaskea to Ballinaclogh section of the N11 Rathnew to Arklow Road Improvement travels approximately south to north through relatively flat countryside in the southeast of County Wicklow. There are gentle hills in the area, for example, Ballymurrin and Ballinameesda Upper and Lower – but generally the landscape is below 120m. Drainage is provided by small rivers, such as Potter's River, Three Mile Water River, Redcross River and the many streams and tributaries feeding into them. Much of the land through which the proposed route passes are grazing fields, and there are boggy areas in several places, such as Roscath, Ballinameesda Upper, Togher, Ballyclogh North, Scratenagh and Cranagh. Plantation forestry exists in the townland of Ballinameesda Upper, mainly overlying the poorer land and pockets of mature woodland occur in Ballard Upper and Lower and Ballyrogan Lower.

Traditionally this is an area consisting of good farmland and through the practices of farming the enclosed landscape has changed very little from 1838 (the 1st edition Ordnance Survey map). The majority of the land is under pasture with little tillage. A survey of the townland names of the region has revealed that they clearly reflect the topography and land use of this small area, particularly before the advent of intensive farming and land drainage schemes. The townland names echo a landscape of scrubby thickets, pasture, perhaps cultivated hazel and willow groves and one or two ploughed fields, punctuated with a few small churches and houses; a landscape that alternates between small rock-strewn hills and low marshy basins (Halcrow Barry Ltd. 2004). It was determined that none of the names of the thirty townlands through which this stretch of road passes relates directly to pre-Christian monuments.

This site was located in Ballyclogh North townland, Dunganstown parish and the barony of Arklow to the immediate west of the current N11, c. 11.5km northeast of Arklow town. The site was in a low lying area.

2.2 Archaeological Landscape

As part of the general research along the scheme and the particular research focussed on this site, the known archaeology from the surrounding environment was assessed. This involved the review of information from the EIS (Margeret Gowen Ltd., 2004), SMR records, previous excavations and developments, as well as any other relevant documentary sources including mapping, and the results of other excavations carried out as part of the N11 Rathnew to Arklow Road Improvement. It also involved typological research based on the nature and date of the excavated archaeology. The excavation at this site revealed burnt mound activity. This has been dated to the middle Bronze Age, although analysis of lithics suggests a Neolithic date.

2.2.1 Neolithic Landscape (4000–2400 BC)

During the Neolithic Period (4000 – 2400 BC), the population in general became more settled, with a subsistence based on crop growing and stock-raising. The coastal plains of east Wicklow are thought to have witnessed the interface between Mesolithic and Neolithic activities in the area. However, the distribution and frequency of Megalithic Tombs constructed during the Neolithic indicates a dramatic shift from a coastal to an upland economy. The mountains of northwest Wicklow and the area of land which lies to the south of Rathdrum and eastwards towards Brittas are the key areas for Megalithic construction. Passage tombs represent the first substantial pattern of settlement and in turn are suggestive of a significant rise in the economic sustainability and affluence of the area. A single portal tomb is known near Brittas (WI036-008) located approximately 2km east of the N11. The small amount of other megaliths located in the east coastal lowlands are unclassified.

Prior to the N11 Rathnew to Arklow Road Improvement there were no known settlement sites dated to the Neolithic in the area. Evidence of Neolithic activity within the environs of the development stems from the discovery of random artefacts, often the only indicator of Neolithic activity in the vast areas without the presence of tombs. A mace head was found in Dunganstown East townland and a possible mace head was discovered in Ballynapark townland, both of which may well indicate prehistoric activity. A mace head is a worked stone object, which was probably attached to a wooden staff (a mace) and used during ceremonies. The example from Ballynapark, made of fine grained quartz sandstone, was found during the harrowing of fields on the west side of the N11 Arklow to Wicklow road at Jack White's Crossroads. Both ends of the stone are naturally blunt and there is no evidence for wear that might indicate use as a hammer, though one edge had been worn smooth and flat (Halcrow Barry Ltd. 2004).

Several polished stone axeheads have also been discovered as isolated finds in south Co. Wicklow. However, none have been found in the vicinity of the current development route. One of the most interesting finds was a pair of porcellanite axeheads from Killamoat, approximately 35km to the west of the N11, which are thought to have originated in Rathlin Island or Tievebulliagh in northeast Ireland (Stout 1994, 11). O' Nualláin has established the significance of coasts and rivers in the diffusion of the Neolithic ritual tombs, identifying a seaborne movement of communities into Wicklow during the 3rd Millennium BC (Stout 1994, 11).

A known flint scatter (WI 031:045) at Coolbeg was directly impacted by the development of the N11 Rathnew to Arklow Road Improvement. A grey flint axe head was also found in the 1950s in Coolbeg. An intensive field survey of the RMP site was conducted as part of the current project, which produced artefacts from four fields (Site A022/066). The presence of small pieces of debitage suggests that lithic production took place at the site. After analysis, the assemblage was determined to be probably late Neolithic (c. 2500 BC) or early Bronze Age in date based on the use of a bipolar smash-and-see technology that is synonymous with the Bronze Age (Sternke, 2007).

Some struck flints have been identified during the archaeological monitoring by Martin Byrne (99E0684) of the excavation of trial-pits for engineering/geotechnical purposes along the route of the N11 Newtownmountkennedy to Ballynabarney Road Improvement (Bennett 2000). In addition, an extensive lithic assemblage was recovered at the Johnstown South enclosure by Martin Fitzpatrick (96E0156: Bennett 1997) during archaeological investigations undertaken as part of the N11 Arklow Bypass. A large concentration of lithic material was uncovered in Ballynamuddagh townland, at the top of a steeply sloped field, on the north-western face of Bray Head,

northeast Wicklow. The hoard comprises forty one cores, sixty flakes, six scrapers and two spalls. It is thought to represent a group of lithics collected at another location and deliberately deposited (00E0692: Bennett 2001). Many of these sites are associated with Bronze Age finds, as at Johnstown South.

Two sites on the scheme recorded Neolithic material. Ballymoyle Sites A022/019 and A022/020 both contained assemblages of lithics which were dated typologically to the Neolithic. One hundred and thirty six lithics were found from the archaeological investigations of two pits at Site A022/019. Site A022/020, located a further 70m to the north, comprised of a large settlement site of thirty four pits, postholes and stakeholes and produced forty-five lithic finds. While the assemblages were Neolithic in origin, the dates retrieved from Site A022/020 were between 1210 – 930 BC and 1420 – 1050 BC placing this site in a middle / middle-late Bronze Age context. While the dates for Site A022/020 indicate Bronze Age activity, the presence of the Neolithic assemblages at both sites certainly indicates Neolithic activity in the area. Five sites on the scheme were dated to the Neolithic period: Sites A022/021, 024, 050, 053 and 057. All but one site, Site A022/057, comprised of burnt spreads. Site A022/057 comprised of two pits.

2.2.2 Bronze Age Landscape (2400 – 500 BC)

It is in the Bronze Age that substantial evidence for settlement in this area emerges. According to Stout (1994), there are several groupings or foci of known Bronze Age activity within Wicklow; four of which she identifies west of the Wicklow mountains. The evidence for at least three areas of activity along the east in the area under discussion were also outlined, but not in as much detail. Most notably there is a focus of sites, such as standing stones, burials and rock art, along the Avoca valley.

The discovery of a fragmented gold torc also gives credence to Bronze Age activity in this region as twisted gold torcs normally date to c. 1200 - 900 BC (the later Bronze Age). The fragment appears to have traces of an original hooked terminal, thought to be a specifically Irish form, while the other end has been broken and hammered flat, possibly in modern times (NMI: 1980:111). Further evidence of activity in the area during this period of prehistory is reflected in a small bronze axe found during ploughing in 1982, in Coolbeg. The blade end of a socketed bronze axe dating to the later Bronze Age was discovered in the spoil of a site at Ballynapark (Site A022/035) near Jack Whites cross roads. The blade end appears to have broken in antiquity, possibly after being embedded in timber or possibly in the moulding process. This site was near to several others with Bronze Age activity, including one possible industrial site, featuring pits and fire reddened clay (Site A022/034) which produced a date range of 2290 – 1960 BC and 2140 – 1910 BC.

Ritual

Only two of the ten known areas of rock art dating to this period are located in the west, with the majority being clustered in the southeast near standing stones west of the Avoca valley (Stout 1994, 13). The frequency and distribution of ritual sites around the southeast of Wicklow is not reflected in the archaeological record of recent excavations in the region. A Bronze Age enclosure in Johnstown South (WI041-005), 4km north of Arklow town. This large sub-circular banked enclosure revealed extensive activity throughout the site (96E0156: Bennett 1997). Several furnaces and hearths indicate that this site was a centre of industry, also involved in producing flint artefacts (hollow-based arrowheads, scrapers, blades, a barbed and tanged arrowhead and a leaf-shaped arrowhead) and pottery. A number of ring ditches on the N11 Newtownmountkennedy to Ballynabarney Road Improvement may indicate ritual activity, but generally consist of burial monuments with cremation pits. However, Site 27 (02E1434; Bennett 2003) Mount Usher consisted of a single,

large, ring ditch enclosing an internal structure marked by post-holes. Within the structure, there was evidence of a possible cremation pyre. Evidence for at least three cremation burials was also found. The structural elements and associated possible cremation pyre suggest a ritual activity at this site.

Burial

During the late Neolithic and Bronze Age periods, a simple earthen mound known as a tumulus was used to cover burials. One of the only recorded prehistoric monuments in proximity to this lower section of the N11 is a tumulus at Coolmore (WI 036:021), which lies to the northeast of a complex of burnt mounds at Scratenagh. Other monuments associated with burial in the Bronze Age are barrows. These are earthen burial monuments, which consist of a circular area surrounded by a fosse often with an external bank. Barrows are often grouped together in cemeteries, but in the Archaeological Inventory of Co. Wicklow, all known examples are isolated (Grogan and Kilfeather 1997, 15). Grogan found that burial sites (i.e. cremation cemeteries) were often located along floodplains and rivers in areas of poor soils, whereas associated settlement sites would have been preferably located upon the higher river terraces. Therefore, many of these burials may have been destroyed or removed through intensive farming concentrated in the east lowlands.

The term ring-ditch is applied to barrows with a flat centre, several of which were excavated on the N11 Newtownmountkennedy to Ballynabarney Road Improvement to the north, such as at Killadreenan (02E0735: Bennett 2003). These sites are also thought to date to the Bronze Age (c.2400 – 500 BC) and early Iron Age (500 BC - AD 400). They were initially thought to be isolated phenomena in the landscape, such as the ring ditch recorded in Rosanna Upper (WI025-036) to the northwest of Rathnew. However, an extensive ring ditch cemetery is listed at Kilpoole Upper c. 400m from the coast (Stephenson 2004, 27). Cairns – stone covered burials, are known from the summits of the Great Sugar Loaf in north Wicklow (near Ballyremon Commons). However, the most frequent type of recorded burial along the east lowlands appears to comprise of cists – earthen or stone lined pits. Examples of known cist burials in southeast Wicklow are found at Glenteige (WI040-036, 7), at Ballynerrin near Wicklow town (WI025-014) and at Knockanree Lower (WI035-041) (Stout 1994, 38); with a Bronze Age cemetery excavated in Ballinagore (94E175: Bennett 1995). Unfortunately, these are usually found by chance during ploughing or gravel quarrying, as they are generally unmarked on the surface.

Settlement

The distribution of Bronze Age settlement left the east lowlands of Co Wicklow relatively lacking in substantial settlement or ritual activity, when compared to the northwest and southwest regions. A major excavation on the N11 Newtownmountkennedy to Ballynabarney Road Improvement revealed a large prehistoric enclosure at Rathmore. Several pits in the interior were discovered, one of which produced a cremation urn. However, no structures were apparent. This high ridged area has been interpreted as a focus of intense Neolithic and Bronze Age ritual activity. Most interestingly a large complex of burnt mounds was discovered here adding to the economic and secular importance of the area. These will be further discussed later. The visual link of the Rathmore enclosure to features across the ravine in the adjacent townland of Kilmartin suggests related activity. Sites at Kilmartin produced large quantities of both lithics and pottery dating to this period proving these sites to be of importance during the late Neolithic and Bronze Age.

A Bronze Age settlement site was recently discovered at Kilbride near the banks of the Potters River comprising of an oval foundation trench, diameter 7.5m, with several postholes thought to delineate an entrance (97E324: Bennett 1998). On a

much larger scale in the northeast of the county, south of Kilmacanoge, a round house of the double-ringed form, with an outer wall slot and internal ring of roofing posts was discovered on a multi-period settlement site (01E0572: Bennett 2002). A number of well established settlement sites are known in the northern half of Wicklow. In recent excavations, a large scale settlement site was discovered in Ballynamuddagh (00E0696: Bennett 2001). Another was found at Cooladangan (A003/053) near the southern boundary of Co. Wicklow in the course of the construction of the N11 Arklow By-pass.

Excavations at Charlesland, located in the northeast of the county to the south of Greystones, Co. Wicklow and to the east of the N11 have revealed an area of high status Bronze Age settlement and ritual activity. In addition to the settlement sites (03E0018 and 03E1028: Bennett 2004) and ring ditch enclosures associated with cremations, several large burnt mounds were also discovered. One site in particular, a large burnt mound with a wood and wattle lined pit, revealed a set of wooden musical instruments at the base of the trough during excavation (03E0592: Bennett 2004). Within this vicinity several similar sites were uncovered at Killincarrig (93E0001 & 93E0001ext.: Bennett 1994).

Burnt Mounds

Fulachta fiadh are an integral part of the prehistoric landscape in Ireland, providing significant evidence of activity with little artefact deposition. Surprisingly, they also form the highest frequency of a single prehistoric monument in Ireland and over the years have generated much interest and interpretation of their function. Current available dates suggest that the tradition of building and using burnt mounds spans most of the early, middle and late Bronze Age (although there would appear to be a concentration of use in the middle Bronze Age). In Ireland, early literary accounts of the use of troughs for cooking purposes have been cited as evidence that burnt mounds were common as late as the 16th century AD (O' Drisceoil, 1988). There are seventeen recorded *fulachta fiadh* in the Co. Wicklow inventory (Grogan & Kilfeather 1997). Between 1980 and 2003 seventy three licensed excavations have been undertaken on burnt mounds, spreads and *fulachta fiadh* in Wicklow (Bennett, 1987-2005).

The distribution of burnt mounds in Co. Wicklow tends to be concentrated in the east, a narrow plain based on Paleozoic rocks and adjacent to streams or lakes. The glacial drift of sandstones and flagstones are favoured by those in the construction of *fulachta fiadh*, however, gley soils contribute to poor drainage, providing a possible explanation for the lack of other Bronze Age sites (Condit, 1990, 20). Of the sixteen *fulachta fiadh* detailed in the Archaeological Inventory of Co. Wicklow, three groups are located at the foot of Djouce Mountain in proximity to the Vartry River or other streams running into the Vartry Reservoir (Grogan and Kilfeather, 1997). These represent the farthest known inland sites in Wicklow. Unfortunately the majority of excavated evidence for *fulachta fiadh* is derived from N11 improvement schemes which have, unavoidably, produced a bias for the overall distribution of this monument in the landscape. However, the recorded *fulachta fiadh* in Co. Wicklow are located in the east lowlands of the county with a few outliers, such as at Ballyremon Commons, lining the base of the mountains. Approximately thirty two out of seventy three excavations occurred within proximity and clear sight of a river/stream and were evidently waterlogged, whilst the majority of sites are located within 5km of the coast (along the N11 corridor).

In the townlands of Ballyremon Commons (WI007:047, 048; WI012:005, 006; licence ref. 0219122) and Sraghmore (WI012:062:2, 3, 4) *fulachta fiadh* are grouped in close vicinity, while at Glasnamullan (WI012:054, 055, 056) a trio of sites may also

represent a small complex. This might suggest that when one *fulacht fiadh* became unusable, another was simply dug nearby. It might also indicate that the locations were specifically chosen and visited over many years or even over several generations. Salvage excavation and surveying was undertaken by Victor Buckley in 1983 (licence ref. 0219122) at Ballyremon Commons in north Co. Wicklow, producing a date of c. 1400 BC. Ballyremon Commons is surrounded by raised bog (Calary Bog to the east). Excavation revealed a sub-rectangular clay lined pit, in which a large quartzite slab and a trio of stakes (perhaps forming a tripod construction within the pit) were found. One of the stakes yielded a middle Bronze Age date for the use of the pit.

Lying 15 – 17 km to the northwest of this scheme, this area has been interpreted as encapsulating a complete Bronze Age settlement pattern (habitation on the higher, better drained bog island and *fulachta fiadh* at the wetland margin and burial monuments in a prominent, but isolated position). Furthermore Buckley suggested that the use of quartzite during the heating process resulted in higher resistance and less cracking, and as a result less shattered debris would be created. This may explain the previously low numbers of known *fulachta fiadh* in Co. Wicklow (Buckley 1998, 112).

Two burnt mounds and one large *fulacht fiadh* were revealed in 1993 in the townland of Killincarrig (93E0001 and ext.: Bennett 1994) c. 1km northwest of Charlesland, where a series of similar sites were exposed. Unusually Charlesland 1 (03E0592: Bennett 2004), a burnt mound with four troughs, unearthened wooden pipes, which were interpreted as a musical instrument, at the base of a wood and wattle lined trough. This group of sites is located less than 1km inland from the coast. A large number of *fulachta fiadh* has been revealed along a section of the realigned N11 in the area south of Cullenmore townland and north of Ashford village. The most notable complex was revealed in the townland of Rathmore (01E0471: Bennett 2002) between Kilmartin and Inchanappa, where twenty four burnt mounds were excavated as part of the N11 Newtownmountkennedy to Ballynabarney Road Improvement, over a stretch of landscape running c. 800m. The majority of the mounds found at Rathmore were each associated with a single rectangular trough, returning dates from the Bronze Age c.2000 – 500 BC. There was a collection of high status finds from these sites, including flint scrapers, flint flakes, a flint knife and a possible fragment of Bronze Age gold ring money. Three burnt mounds and one small spread of burnt mound material were excavated at the site at Inchanappa South (04E1717: Bennett 2005). The sites were located in the small valley of a tributary of the Vartry River, an area prone to being quite wet.

Newly discovered archaeological sites, uncovered as a result of the construction of the N11 Newtownmountkennedy to Ballynabarney Road Improvement included a number of burnt mounds, or *fulachta fiadh* (e.g. in Ballyhenry and Inchanappa).

Sixty three sites were identified and excavated along the route of the N11 Rathnew to Arklow Road Improvement, of which thirty two have been interpreted as representing the remains of burnt mounds, *fulachta fiadh* and/or shallow burnt spreads. Five sites produced dates from the Neolithic Period – Sites A022/021, 050, 053, 057 and 064. Three sites produced dates representing late Neolithic-early Bronze Age activity – Site A022/024, 050 and 063. The majority of the sites, however, produced dates from the early and middle Bronze Age. The early Bronze Age activity was recorded at Sites A022/017, 027, 032, 034, 035, 041, 044, 050, 054, 060, 061, 063, 071, 073 and 074. Three sites returned dates from the cusp of the early / middle Bronze Age: Sites A022/022, A022/038 and A022/053. Middle Bronze Age activity was identified at

Sites A022/017, 020, 026, the present site (A022/043), 044, 045, 046, 052, 053 and 063.

Five burnt mound sites showed evidence of activity across a number of periods. Site A022/017 in Ballinaskea, Site A022/044 in Ballyclogh North and Site A022/063 in Roscath show evidence for both early Bronze Age and middle Bronze Age activity. Site A022/050 in Kilmurry North produced Neolithic and late Neolithic-early Bronze Age dates, while Site A022/053 Ballyvaltron had a Neolithic and middle Bronze Age date. The complex of mounds and spreads at Coolacork (Sites A022/061 and A022/062) and Roscath (Site A022/063) had the most significant date range with dates from the late Neolithic, early and middle Bronze Age and late Bronze Age. This was the only burnt mound site to produce a late Bronze Age date 1210 – 930 BC and the range of dates clearly shows a continuation of settlement in this area. Nine sites from the scheme were undated.

There are six distinct groups or complexes of burnt mounds along the N11 Rathnew to Arklow Road Improvement comprising 26 sites in total, whereas the rest of the six burnt mounds excavated remain in our knowledge as isolated phenomena. The range of dating for these sites indicates a sequence and continuation of activity from the Neolithic through to the Bronze Age.

The first complex was identified in Ballinaskea where Site A022/017 returned dates between 1430 – 1120 BC and 2210 – 1970 BC. This is associated with four nearby examples, two of which were previously excavated in association with the N11 Arklow By-pass and two RMP sites. These were located less than 300m away in Johnston North (97E207, 97E0252, WI041-004, WI041-007,).

Four sites ranging in date from the late Neolithic to the middle Bronze Age were identified in Scratenagh – Sites A022/021, 022, 023, 024 and 026. These range in date from 2630 – 2350 BC and 1381 – 1001 BC, with Site A022/023 dating to the Iron Age (390 – 200 BC). While Site A022/023 produced an Iron Age date, it is interpreted that the burnt mound is Bronze Age and that the dated feature was not associated.

In Ballynapark there were three sites – Sites A022/035, 037 and 038 – with a further two sites nearby in Cloghoge – Sites A022/039 and A022/081 and one nearby in Cranagh Site A022/032. This complex of sites is dated to the early and middle Bronze Age ranging in date from 2130 – 1880 BC and 1520 – 1390 BC.

Similar date ranges were recorded for six sites in Ballyclogh North and South – Sites A022/040, 041, the present site (Site A022/043), 044, 045 and 046 ranging in date from 2020 – 1770 BC and 1320 – 1000 BC.

Five sites were identified in Kilmurry South (Sites A022/047 and 048), Kilmurry North (Site A022/050) and Ballyvarton (Sites A022/052 and 053). This complex contained some of the earliest dated burnt mounds on the scheme ranging from the Neolithic to the middle Bronze Age with dates from 3959 – 3695 BC and 1270 – 1010 BC.

The final complex was centred on the townlands of Coolacork (Sites A022/061 and A022/062) and Roscath (Site A022/063) which have already been referred to above. These ranged in date from 2460 – 2040 BC and 1210 – 930 BC.

The burnt mound sites from the N11 Rathnew to Arklow Road Improvement provide evidence of continuity of settlement from the Neolithic through the Bronze Age with a clear peak of activity in the early and middle Bronze Age. This continuity of

settlement is also evidenced by the number of complexes or groups of sites across the scheme, all of which have produced a range of dates.

2.2.2 Site Specific Archaeological Landscape

This site was located in the townland of Ballyclogh North and consisted of burnt mound material, with associated pits and troughs, dating to the middle Bronze Age with a two sigma radiocarbon date of 1400-1050 BC (WK20707, Appendix 2.2). Analysis of the sites excavated in immediate proximity to this site showed several examples which were superficially similar to the subject site. Specialist analysis of materials recovered from these sites has shown that whilst some of these sites are the product of burnt mound style activities, in some cases they don't quite fit with the accepted date range for this monument type but rather would appear to have a date range from the late Neolithic to the Iron Age, with some site elements of sites having an earlier Neolithic date, as such the date range of some of the neighbouring sites may overlap with that of the subject site.

The sites to the south showed some similarity with the subject site; Site A022/041, 400m to the south, in Ballyclogh North townland, comprised three areas of burnt spread activity with the fill of one of the three troughs yielding a date of 2020–1770 BC (Wk 20671), which would be broadly contemporary with this site. Approximately 100m further south was Site A022/040, a shallow burnt mound with a further shallow burnt spread and a single pit. None of the features on this site were radiocarbon dated but lithics found in the burnt spread suggested that it was a result of Bronze Age activity.

To the south of Ballyclogh in Cloghoge, there was a burnt mound (Site A022/081). Further south in the townlands of Ballynapark, Cranagh and Cloghoge there was a complex of five burnt mounds. Sites A022/039 and A022/037 were both undated but lithics associated with the Bronze Age were found at the former. Between these sites was Site A022/038 which also contained a burnt mound and several pits and was dated to the early/middle Bronze Age. Approximately 1km to the south lithic analysis at burnt mound Site A022/035 dated one phase of activity to the Neolithic, probably the middle Neolithic. Radiocarbon dating indicated an early Bronze Age date for the remainder of the activity on site. Site A022/032, 1.1km to the south consisted of a burnt mound dated to the early Bronze Age. Two possible pit burials dated to the middle Bronze Age were recorded at Sites A022/033 and A022/034, also in Cranagh.

To the north the closest site to the subject site was Site A022/044, which was located in the townland of Ballyclogh North. This site comprised burnt mound style activity which was dated to the early Bronze Age period (1920–1690 BC, Wk 20706). Excavation revealed two areas of archaeology; Area A comprised a trough, an adjacent line of postholes/stakeholes and associated spreads of burnt mound material. Area B comprised a trough, an adjacent pit and an associated spread of material. Site A022/045 was located 25m further north in Ballyclogh North and comprised more burnt mound activity; a spread and two troughs were present on site, the larger trough contained several timbers which may have formed a platform (1420–1200 BC, Wk 20673) and a partial wood lining. The second trough cut a crescent shaped slot trench and was dated to 1370–1050 BC (Wk 20672). Analysis of the lithics recovered from site has suggested a final Neolithic/ early Bronze Age date for the assemblage.

Further north at Site A022/046 in Ballyclogh North and comprised two concentrations of burnt mound activity, the southern of these, Area A, comprised a trough, two pits, with associated working platform and overlying spread, these have been dated to the late Neolithic/Beaker Period, c. 2450–2200 BC, through pottery analysis. To the

north, Area B, comprised a trough, with two spreads, a wattle screen and associated working platform dated to 1320–1000 BC (Wk20674), putting this phase of activity in the middle Bronze Age.

Further north two undated burnt mounds were excavated at Kilmurry South. These were Site A022/047 and A022/048, which has been dated to the late Neolithic/early Bronze Age through analysis of lithics. Also in Kilmurry South was Site A022/049, comprised of two pits in isolation, one of which produced pottery during the test excavation phase of works. The sherds recovered were identified as Beaker pottery and suggested to date to c. 2300 BC (Grogan and Roche 2007). The location of this site on higher ground separated it from the generally low lying sites in this vicinity, which were predominantly related to burnt mound style activity.

Only one known RMP site was located in the vicinity of the site; WI036:016, which is the site of an enclosure in Ballinaclea townland. A mill stone and a possible mace head were found by a landowner in the vicinity of Site A022/035.

The evidence from these surrounding excavations suggests that the area was occupied continuously from the early Neolithic period, through to Bronze Age period. Much of this activity is in the form of burnt mounds which is to be expected given the low-lying nature of the natural topography.

2.2.3 Typological Background of Burnt Mounds

This site revealed archaeology related to burnt mound activity. Burnt mound sites (also commonly referred to as *fulacht fiadh*) are one of the most common field monuments found in the Irish landscape. The last published survey (Power et al. 1997), carried out over a decade ago, recorded over 7,000 burnt mound sites and in excess of 1,000 sites have been excavated in recent years through development led archaeological investigations. In spite of this no clear understanding of the precise function of these sites has been forthcoming.

Burnt mound sites are typically located in areas where there is a readily available water source, often in proximity to a river or stream or in places with a high water table. In the field burnt mounds may be identified as charcoal-rich mounds or spreads of heat shattered stones, however, in many cases the sites have been disturbed by later agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

Ó Néill (2003–2004, 82) has aptly identified these sites as the apparatus and by-product of pyrolithic technology. This technology involved the heating or boiling of water by placing fire-heated stones into troughs of water. Small shallow round-bottomed pits, generally referred to as pot boiler pits or roasting pits, are often associated with burnt mound sites. The purpose of these pits remains unclear. Occasionally large pits are also identified and may have acted as wells or cisterns. Linear gullies may extend across the site, often linked to troughs and pits, and demonstrate a concern with onsite water management. Post and stakeholes are often found on burnt mound sites and these may represent the remains of small structures or wind breakers.

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley et al. 1989–90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan et al. 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh, 1990, 47), have been dated to the medieval period. Thus although burnt mound sites

generally form a components of the Bronze Age landscape, the use of pyrolithic technology has a long history in Ireland.

Although there is a general consensus that burnt mound sites are the result of pyrolithic technology for the heating or boiling of water, the precise function of these sites has, to date, not been agreed upon. Several theories have been proposed but no single theory has received unanimous support. The most enduring theory is that burnt mounds sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie et al. 2007).

3 METHODOLOGY

3.1 Introduction

The excavation at Site A022/043, Ballyclogh North was undertaken as part of archaeological mitigation for the N11 Rathnew to Arklow Road Improvement in the townland of Ballyclogh North .

3.2 Methodology

The topsoil was reduced to the interface between natural and topsoil using a 20 tonne excavator machine equipped with a flat toothless bucket under strict archaeological supervision. The remaining topsoil was removed by the archaeological team with the use of shovels, hoes and trowels in order to expose and identify the archaeological remains. A site grid was set up at 10m intervals and was subsequently calibrated to the national grid using GPS survey equipment.

All features were subsequently fully excavated by hand and recorded using the single context recording system with plans and sections being produced at a scale of 1:50, 1:20 or 1:10 as appropriate.

A complete photographic record was maintained throughout the excavation. Digital photographs were taken of all features and of work in progress.

An environmental strategy was devised at the beginning of the excavation. Features exhibiting large amounts of carbonised material were the primary targets as well as waterlogged preserved wooden features.

Lithics uncovered on site they were dealt with in accordance with the guidelines as issued by the NMI and in consultation with the relevant specialists. The archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland

Dating of the site was carried out by means of AMS (Accelerator Mass Spectrometry) Radiocarbon Dating of identified and recommended charcoal samples. All calibrated radiocarbon dates are quoted to 2 sigma. Dating of the site also involved flint analysis through typological study.

3.3 Report Production Methodology

Groups and subgroups

For the purpose of this report the archaeological remains are described by way of sub-groups (stratigraphically connected contexts, generally derived from a defined and stratigraphically independent archaeological action or sequence of actions). Groups define related sub-groups. Phasing of the site is based on the grouping of the groups, and this is described in the discussion (Section 5).

In the following text, the author has used three types of brackets:

{ } = These enclose Subgroup numbers.

() = These enclose Deposit/Fill numbers

[] = These enclose both Cut and Masonry Structure numbers

The author has allocated Subgroup numbers starting from {1000} to avoid confusion with existing context numbers.

Example:

- Subgroup {1400} consists of Cut [x] and fills (y) and (z)

- Subgroup {1456} consists of Cut [a] and fill (b), Cut [c] and fill (d), Cut [e] and fill (f). Cuts [a], [c], and [e] have been shown to be related and can therefore be placed in one collective Subgroup.

All sites on the scheme have been referenced in the text with their site code and townland. A full list of sites from the scheme is available in Appendix 3.

4 EXCAVATION RESULTS

4.1 GROUP I: Natural Drift Geology

4.1.1 Subgroup: {1001} Natural Drift Geology

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
2	Deposit			-	-	-	Yellow, sandy clay	Natural
11	Fill			0.26	8.6	-	Loose red / yellow, sand with inclusions of small stones and pebbles. Situated in southeast of burnt mound,	Natural deposition of mottled sand, associated with iron panning and water leeching activity
25	Deposit			0.1	1.9	-	Firm, grey clay with inclusions of small stones.	Natural deposit

Finds: None

Interpretation:

The natural subsoil was generally yellow sandy clay (C2). Natural deposits (C11) and (C25) represent variations within this.

GROUP I Discussion: Natural Drift Geology

Group	Subgroup	Subgroup Type	Period by Finds/Stratigraphy	Period by Interpretation	Group Interpretation
1	1001	Natural	N/A		Natural geology

All archaeological features cut through or overlay these natural deposits.

4.2 GROUP II: Prehistoric Activity

4.2.1 Subgroup {1002} Pit C53

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
51	Fill	C53		0.33	1.9	1.6	Moderately compact, grey/black, sandy clay frequent inclusions of angular heat-shattered stone	Fill of pit
53	Cut		C51	0.33	1.9	1.6	Sub-circular cut with an imperceptible break of slope at the top. Steeply sloping sides with an imperceptible break of slope at the base.	Cut of pit, truncated by trough c54

Finds: None

Interpretation:

Subgroup {1002} (Figure 4) comprised a pit that was truncated by trough [C54], and sealed by burnt spread material. The pit [C53] was sub-circular in plan and contained one fill (C51) which consisted of grey / black sandy clay containing heat-affected stone. This pit was associated with the burnt mound activity linked to trough [C54] and was sealed by the burnt mound.

4.2.2 Subgroup {1003} Trough C54

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
36	Fill	C54		0.36	2.2	2.5	Loose, black, gritty clay with inclusions of stones and charcoal.	Fill of trough
42	Timber-lining	C54		0.1	1.7	1.2	Rectangular timberstructure within cut of trough	Timber lining of trough
54	Cut		C36	0.5	2.3	2.3	Rectangular shaped cut with rounded corners, gradual break of slope at top. Steep sloping north side and gradual on other sides. Break of slope at the base was gradual and the base was flat.	Cut of trough

Finds: None

Interpretation:

The trough [C54] (Figures 4, 6, 7, Plates 1, 2 and 3) was cut through the natural subsoil. An oak platform was located to its northwest (Plate 1).

The base and sides of the trough were lined with planks which were in a very poor state of preservation. This lining consisted of three planks on the sides of the trough and four along the base. One side the trough was constructed of oak (*Quercus spp.*) and the other of alder (*Alnus glutinosa*). And similarly, the base timbers consisted of one alder and one oak plank. All of the trough timbers were half split (O'Carroll, Appendix 2.1).

The base of the trough was below the water table and as a result it filled naturally with water from the adjacent stream. Once the trough filled with water, heat-affected stones would have been placed in the water to boil it. Various interpretations have been put forward for the use of these burnt mound sites. The firing debris was cleaned out of the trough after each use and this produced the burnt mound. This type of site could have been used for cooking, bathing, dyeing or industrial activity. The primary purpose of these sites however, was to boil water.

4.2.3 Subgroup {1004} Wooden Platform

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
10	Wood			0.10	2.1	1.24	Wooden platform containing 15 timbers – numbered 1-15	Wood - lined timber trough.
15	Layer			0.04	2.0	0.60	Loose, grey, silty sand with frequent inclusions of small rounded pebbles	Deposit situated around timbers 5-10
16	Layer			0.04	2.0	0.65	Loose, red / brown, clayey silt with occasional inclusions of small sub-rounded stones and roots	Deposit situated around timbers 1 - 5
17	Fill	C18		0.22	0.10	0.10	Loose, brown sandy clay with inclusions of wood fragments.	Fill of stakehole
18	Cut		C17	0.22	0.10	0.10	Circular in plan. Sharp break of slope at top with vertical sides. It had an imperceptible break of slope at base.	Cut of supporting stakehole for timber platform (c.10)
19	Fill	C20		-	0.10	0.10	Loose, brown silt with inclusions of wood fragments associated with stake contained therein.	Fill of stakehole
20	Cut		C19	-	0.10	0.10	Circular in plan with a sharp break of slope at top, vertical sides and, rounded base.	Cut of supporting stakehole for timber platform (c.10)

21	Fill	C22		0.30	0.06	0.06	Wood fragments (remnants of stake)	Fill of stakehole
22	Cut		C21	0.30	0.06	0.06	Circular in plan, sharp break of slope at top with vertical sides.	Cut of supporting stakehole for timber platform (c.10)
23	Fill	C24		0.10	0.07	0.07	Loose compaction of wood fragments (remnants of stake).	Fill of stakehole
24	Cut		C23	0.10	0.07	0.07	Circular in plan with angular corners, sharp break of slope at top. The base was flat.	Cut of supporting stakehole for timber platform (c.10)
26	Fill	C27		0.15	0.10	0.10	Loose, brown silty sand with inclusions of wood fragments.	Fill of stakehole
27	Cut		C26	0.15	0.10	0.10	Triangular in plan, rounded corners, sharp break of slope at top and vertical sides.	Cut of stakehole
28	Fill	C29		0.25	0.08	0.06	Loose, brown silty clay with inclusions of wood chippings	Fill of stakehole
29	Cut		C28	0.25	0.08	0.06	Circular in shape with vertical break of slope at top.	Cut of stakehole
30	Fill	C31		0.15	0.04	0.04	Loose, brown, silty clay with inclusions of wood fragments.	Fill of stakehole
31	Cut		C30	0.15	0.04	0.04	Circular in shape and vertical break of slope at top.	Cut of stakehole
32	Fill	C33		0.16	0.10	0.07	Loose compaction of brown silty peat with no inclusions.	Fill of stakehole
33	Cut		C32	0.16	0.10	0.07	Circular in plan.	Cut of stakehole
34	Fill	C35		-	0.15	0.12	Loose, brown silt containing a stake.	Fill of stakehole
35	Cut		C24	-	0.15	0.12	Oval in plan with a sharp break of slope at the top. Shape of slope at base was pointed mimicking stake shape	Cut of stakehole

Finds: None

Interpretation:

Subgroup {1004} (Figure 4, 6, 7, Plates 4 and 5) comprised a wooden platform located northwest of trough [C54], that was sealed by burnt mound material. The platform was placed on the natural subsoil.

Platform (C10) was a rectangular shaped feature. All of the timbers identified from the platform were of oak (O'Carroll, Appendix 2.1). The wood was in a good state of preservation. Fifteen half split and radial splits oak timbers were identified from the platform and nine posts were driven into the subsoil to hold the platform in place. The wood from these posts was in a poor state of preservation (Plate 6). The post identified from (C19) was made of ash (*Fraxinus excelsior*), as was the charcoal identified from the same feature (O'Carroll, Appendix 2.1).

The wooden platform (C10) was identified as oak (*Quercus spp.*). A sample sent for C14 dating returned a result of 3000 +/- 52BP. This gave a two sigma radiocarbon date range of 1400 – 1050BC placing this activity in the middle Bronze Age period (WK20707, Appendix 2.2).

This platform was connected with the burnt mound activity associated with trough [C54] and was sealed by the burnt mound. This platform was quite substantial and may have functioned as a dry, flat area where certain activities like the preparation or eating of food was carried out.

4.2.4 Subgroup {1005} Posthole C57

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
56	Fill	C57		0.21	0.24	0.23	Loose, dark brown / black, silty sandy clay with infrequent inclusions of charcoal flecks.	Fill of post hole
57	Cut		C56	0.21	0.24	0.23	Circular in plan with a sharp break of slope at top and vertical sides, it had a gradual break of slope at base and the base was flat/	Cut of post hole

Finds: None

Interpretation:

This subgroup (Figure 4; Plate 7) represents a posthole located to the northwest of trough [C54]. It was filled by (C56), a dark brown / black, silty, sandy clay with infrequent charcoal fleck inclusions. This posthole was connected with the burnt mound activity associated with the trough.

4.2.5 Subgroup {1006} Pit C40

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
38	Fill	C40		0.12	0.86	0.75	Loose, grey, sandy silt with frequent stone inclusions	Fill of pit
40	Cut		C38 C43	0.30	1.6	1.3	Circular in plan with a sharp break of slope at the top. Slightly concave sides with a gradual break of slope at base. The base was flat.	Cut of pit
43	Fill	C40		0.3	1.6	1.3	Loose, grey / brown, sandy silt with charcoal fleck inclusions	Fill of pit

Finds: None

Interpretation:

Subgroup {1006} (Figure 4) comprised a pit, located to the southeast of trough [C54], that was sealed by burnt spread material. It contained two fills (C38) and (C43), both of which were sandy silts. This pit was associated with the burnt mound activity to its north.

4.2.6 Subgroup {1007} Pit C49

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
48	Fill	C49		0.09	0.72	0.64	Black / brown, sandy clay with frequent inclusions of sub-angular stone.	Fill of pit
49	Cut		C48 C50	0.09	0.80	0.76	Circular in plan with a gradual break of slope at the top. The sides were concave and the break of slope at base was gradual. The base was flat.	Cut of pit
50	Fill	C49		0.15	0.80	0.76	Loose, black / brown sandy clay with frequent inclusions of sub-angular stone.	Fill of pit

Finds: None

Interpretation:

Subgroup {1007} (Figures 4 and 5; Plate 8) consisted of a pit, located immediately south of pit [C44] and northeast of pit [C55] and was sealed by burnt spread material. The pit contained two fills (C48) and (C50) both of which were of black / brown sandy clay with frequent inclusions of sub-angular stones. This pit was connected to the nearby burnt mound activity.

4.2.7 Subgroup {1008} Pit C44

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
44	Cut		C52	0.12	0.81	0.74	Circular in plan with a gradual break of slope at top and concave sides. The break of slope at base was gradual and the base was flat.	Cut of pit
52	Fill	C44		0.12	0.81	0.74	Loose, black / brown, sandy clay with frequent inclusions of sub-angular stone.	Fill of pit

Finds: None

Interpretation:

Subgroup {1008} (Figure 4; Plate 8) represents a pit located immediately north of pit [C49] that was sealed by burnt mound material. Pit [C44] contained one fill (C52) of friable black / brown, sandy clay with frequent sub-angular stone inclusions. This pit was connected with the surrounding burnt mound activity.

4.2.8 Subgroup {1009} Pit C55 and Upcast From Its Excavation

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
37	Fill	C55		0.04	2.0	2.4	Loose, dark grey / black, silty clay with frequent inclusions of sub-angular pebbles, charcoal and red ochre.	Burnt mound material
46	Spread			0.28	3.30	2.20	Irregular shaped spread. Very firm compaction of yellow, sandy clay. It had no inclusions	Upcast from digging of pit C55
47	Fill	C55		0.15	0.9	0.54	Firm. sandy clay with no inclusions/	Fill of pit
55	Cut		C47	0.38	2.48	1.8	Irregular shaped feature with an imperceptible break of slope at top, gradual sides and an imperceptible break of slope at base. The base was flat.	Cut of pit

Finds:

Find #	Context #	Material	Period	Description
E3229/A022/043:37:56	37	Flint	Mid/late Neolithic	Flint flake

Interpretation:

This subgroup (Figures 4, 6 and 7; Plate 1) represents a possible pit located northeast of trough [C54] sealed by burnt mound material and the subsoil that was removed to create it. It contained two fills (C47) and (C37). The top fill (C37) was dark grey / black, silty clay with frequent inclusions of sub-angular pebbles, charcoal and pockets of fire-reddened clay. The basal fill (C47) was a firm. sandy clay with no inclusions. This pit was associated with the surrounding burnt mound activity.

A single flint (E3229/A022/043:37:56) was recovered from this pit. The lithic was included in the assemblage of finds sent for specialist analysis and suggests that this element of the site most likely dated to the later phases of the middle Neolithic or early phases of the late Neolithic period.

GROUP II Discussion: Prehistoric Activity

Group	Subgroup	Subgroup Type	Period by Finds/Stratigraphy	Period by Interpretation	Group Interpretation
2	{1002}	Pit	Unknown	Bronze Age	Burnt mound features
2	{1003}	Trough	Unknown	Bronze Age	Burnt mound features
2	{1004}	Wooden Platform	Unknown	Bronze Age	Burnt mound features
2	{1005}	Posthole	Unknown	Bronze Age	Burnt mound features
2	{1006}	Pit	Unknown	Bronze Age	Burnt mound features
2	{1007}	Pit	Unknown	Bronze Age	Burnt mound features
2	{1008}	Pit	Unknown	Bronze Age	Burnt mound features
2	{1009}	Pit	Mid/late Neolithic	Bronze Age	Burnt mound features

This group represents all of the archaeological features identified and recorded underneath the burnt mound on this site. A series of pits, a posthole, a trough and a wooden platform feature were recorded. These features most likely represent the remains of contemporary activity associated with burnt mound/*fulacht fiadh* activity.

A sample of oak from wood platform (**C10**) was sent for C14 dating and returned a date of 3000 +/- 52BP. This gave a two sigma radiocarbon date range of 1400–1050BC places the activity in the middle Bronze Age period (WK20707, Appendix 2.2).

A single flint artefact (E3229/A022/043:37:56) was recovered from pit [C55]. The lithic was included in the assemblage of finds sent for specialist analysis. The collection of flint finds recovered on site most likely dates to later phases of the middle Neolithic or early phases of the late Neolithic period. However this may well be residual (Sternke, Appendix 2.3).

4.3 GROUP III: Burnt Mound

4.3.1 Subgroup {1010} Burnt Mound

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation
9	Spread			0.34	16.10	12.55	Sub-circular in plan. Loose brown / black, silty sand with frequent inclusions of burnt stone.	Burnt mound material
12	Fill			0.40	-	0.60	Firm, red, yellow silt with black patches of clay and inclusions of small stones.	Re-deposited clay
13	Spread			0.28	13	4.45	Loose, red / brown silty sand.	Burnt mound material
14	Deposit			0.24		3.9	Loose, red / brown silty sand almost peat-like in texture with small stone inclusions	Decayed peat - like material
39	Deposit			0.11	3.20	3.10	Loose, dark brown / black sandy silt with frequent inclusions of heat-shattered angular stone and charcoal flecks	Burnt mound material
41	Deposit			0.18	5.40	4.30	Compact mid brown / grey clay with occasional inclusions of small angular and sub-angular stones.	Redeposited material

Finds:

Find #	Context #	Material	Period	Description
E3229/A022/043:9:1	9	Flint	Mid/late Neolithic	Retouched Flake
E3229/A022/043:9:2-5	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:6	9	Flint	Mid/late Neolithic	Core
E3229/A022/043:9:7-8	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:9	9	Flint	Mid/late Neolithic	Scraper
E3229/A022/043:9:10	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:11	9	Flint	Mid/late Neolithic	Natural Chunk
E3229/A022/043:9:12	9	Flint	Mid/late Neolithic	Core
E3229/A022/043:9:13	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:14a	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:14b	9	Flint	Mid/late Neolithic	Debitage
E3229/A022/043:9:15	9	Flint	Mid/late Neolithic	Natural Chunk
E3229/A022/043:9:16-18	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:19	9	Flint	Mid/late Neolithic	Polished Flake
E3229/A022/043:9:20	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:21	9	Flint	Mid/late Neolithic	Scraper
E3229/A022/043:9:22-26	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:27	9	Flint	Mid/late Neolithic	Debitage
E3229/A022/043:9:28	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:29	9	Flint	Mid/late Neolithic	Natural Chunk
E3229/A022/043:9:30	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:31	9	Flint	Mid/late Neolithic	Debitage
E3229/A022/043:9:32-33	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:34	9	Flint	Mid/late Neolithic	Debitage
E3229/A022/043:9:35	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:36	9	Flint	Mid/late Neolithic	Debitage
E3229/A022/043:9:37-38	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:39-41	9	Flint	Mid/late Neolithic	Debitage
E3229/A022/043:9:42	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:43-44	9	Flint	Mid/late Neolithic	Core
E3229/A022/043:9:45	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:46	9	Flint	Mid/late Neolithic	Retouched Flake
E3229/A022/043:9:47	9	Flint	Mid/late Neolithic	Natural Chunk
E3229/A022/043:9:48	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:49-50	9	Flint	Mid/late Neolithic	Retouched Flake
E3229/A022/043:9:51-52	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:53	9	Flint	Mid/late Neolithic	Retouched Flake
E3229/A022/043:9:54	9	Flint	Mid/late Neolithic	Distally Trimmed Blade
E3229/A022/043:9:55	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:57	9	Flint	Mid/late Neolithic	Scraper
E3229/A022/043:9:58	9	Flint	Mid/late Neolithic	Core
E3229/A022/043:9:59	9	Flint	Mid/late Neolithic	Retouched Flake
E3229/A022/043:9:60	9	Flint	Mid/late Neolithic	Flake
E3229/A022/043:9:61	9	Flint	Mid/late Neolithic	Natural Chunk
E3229/A022/043:9:62	9	Flint	Mid/late Neolithic	Flake

Interpretation:

Subgroup {1010} (Figure 4, Plates 9 & 10) comprised a burnt mound spread which sealed all archaeological features recorded in Group II. The spread consisted of six layers, some of which can be attributed to natural silting or re-deposited natural. A large amount of flint artefacts were discovered within the main deposit of the spread (C9); these flint finds formed the majority of the lithic assemblage recovered at this site. They were subsequently sent for specialist analysis (Figure 9). The assemblage most likely dates to later phases of the middle Neolithic or early phases of the late Neolithic period (Sternke, Appendix 2.3). The lithic assemblage is made up of 14 retouched artefacts: 40 flakes and 6 cores. It also includes 10 pieces of flint debitage (Sternke, Appendix 2.3).

GROUP III Discussion: Burnt Mound

Group	Subgroup	Subgroup Type	Period by Finds/Stratigraphy	Period by Interpretation	Group Interpretation
3	1010	Burnt spread	mid/late Neolithic	Mid Bronze Age	Burnt mound

Subgroup {1010} comprised waste material associated with the workings of the site. The spread was a black silty sand containing frequent inclusions of heat-shattered sandstone and occasional charcoal flecking. A large amount of flint artefacts were discovered within the main deposit of the spread (C9) and these flint finds formed the majority of the lithic assemblage recovered. The collection of flint artefacts most likely date to the later phases of the middle Neolithic or early phases of the late Neolithic period (Sternke, Appendix 2.3). The use of a predominantly scalar technology is particularly common in the final stages of the Neolithic period, particularly in the south half of the island of Ireland and is the basis of the suggested dating of the assemblage (Sternke, Appendix 2.3).

This spread represented the remains of firing debris that are often found to have been heaped up around the trough in a 'horseshoe' shape at burnt mound or *fulacht fiadh* sites. It is likely that as no surface expression of this site remained, the mound has been gradually flattened by agricultural practices.

4.4 GROUP IV: Topsoil

4.4.1 Subgroup {1011} Topsoil

Contexts:

C	Area	Fill of	Filled by	Interpretation	Description
1	Site	N/A	N/A	Topsoil	Dark brown, sandy clay which contained a moderate amount of sub-angular stone inclusions.
3	Site	N/A	N/A	Topsoil	Same as C1

Finds:

Find #	Context #	Material	Period	Description
E3229/A022/043:1:1	1	Flint	mid/late Neolithic	Scraper
E3229/A022/043:1:2	1	Flint	mid/late Neolithic	Core
E3229/A022/043:3-5	1	Flint	mid/late Neolithic	Scraper
E3229/A022/043:1:6	1	Flint	mid/late Neolithic	Arrow head
E3229/A022/043:1:7	1	Flint	mid/late Neolithic	Debitage
E3229/A022/043:1:8	1	Stone	Natural	Unworked
E3229/A022/043:1:9	1	Flint	mid/late Neolithic	Scraper
E3229/A022/043:3:1-2	3	Flint	mid/late Neolithic	Flake
E3229/A022/043:3:3	3	Flint	mid/late Neolithic	Debitage
E3229/A022/043:3:4	3	Flint	mid/late Neolithic	Retouched Flake

Interpretation:

Subgroup {1011} consisted of a layer of topsoil which sealed all archaeological features on the site. 9 flint artefacts were discovered during the removal of the topsoil.

GROUP IV Discussion: Topsoil

Group	Subgroup	Subgroup Type	Period by Finds/Stratigraphy	Period by Interpretation	Group Interpretation
4	1011	Topsoil	N/A	N/A	Topsoil

The topsoil sealed all archaeological features on site and was removed using an excavator equipped with a flat, toothless bucket under strict archaeological supervision. These flint finds were included in the lithic assemblage recovered at this site, which was sent for specialist analysis. The collection of flint artefacts recovered on site most likely dates to later phases of the middle Neolithic or early phases of the late Neolithic period (Sternke, Appendix 2.3).

5 DISCUSSION

5.1 Physical Setting

The geology of the region surrounding Ballyclogh North consists of rolling lowland composed of a glacial drift mixture of shaley sandstone and slates; on either side of Wicklow uplands, “Ordovician shales and slates form a jagged edge to the rounded granite” (Alaen, F.H.A. 1997). The soils of the county have developed on glacial materials deposited by successive glaciations. Generally, the soils in the county are fertile except for the peaty podzols, notable in the central upland.

The predominant soil at this site was well-drained mid-brown clayey silt with occasional small stone inclusions. The profile was characterised by a dark brown surface horizon to a depth of c. 0.40m. Below this level, the parent material consisted of grey / yellow silty clay firm *in situ* and friable *ex situ*; with occasional small stone inclusions.

The main focus of the site at Ballyclogh North occupied a low-lying area characterised as a wetland/*turlough* landscape. Turlough landscapes are seasonal ground water dependent wetlands. Few turloughs can be considered as truly dry or wet; most are intermediate or dry-wet mosaics (www.bioone.org, 2008).

5.2 Summary of the Site Specific Archaeological Landscape

To the south of the site were burnt spread Sites A022/042, A022/041, A022/040, A022/038, A022/039, A022/030 and Sites A022/032 – 035. These were dated to between the middle Neolithic and the middle Bronze Age. Site A022/031 contained four pits which dated from the early Neolithic to the Medieval period. No suitable material for dating was recovered from Site A022/042 immediately south of the site.

To the north three further burnt mound sites were excavated in Ballyclogh North and South. The three sites A022/044, 045, and 046 ranged in dates that indicate Bronze Age activity. To the north two more undated burnt mounds were excavated at Kilmurry South, Sites A022/047 and A022/048.

5.3 Summary of Excavation Results

The archaeological material identified comprised of middle Bronze Age burnt mound/*fulacht fiadh* activity. Trough [C54], a posthole [C57] a group of pits and a wooden platform (C10) were all sealed by a spread of burnt mound material. The site was located in close proximity to three other sites, Sites A022/044, 045 and 046. These four sites appeared to be part of a burnt mound complex as all sites were located within c. 30m of one another.

The main focus of activity was trough [C54]. The base of the trough was located below the water table and as a result filled naturally with water from an adjacent stream. The remnants of a wood lining of oak and alder were discovered within this trough. The firing debris was cleaned out of the trough after each use and this produced the characteristic surrounding burnt mound.

All of the other features on the site were in close proximity to the trough. The group of postholes were possibly evidence of an upright structure whose function was associated with the burnt spread activity on the site. It is suggested that the postholes represent a fixing such as windbreak, a butchering stand, a hut structure, or alternatively they may have acted as the basis for posts or poles for hanging meat prior to cooking.

A wooden platform (**C10**) was located to the north of the trough and was sealed by burnt mound material. The platform was placed on the natural subsoil (Plates 4 and 5, Figure 5b). A sample of Oak from wood platform (**C10**) was also sent for C14 dating and returned a two sigma radiocarbon date of 1400–1050BC, placing the platform in the middle Bronze Age period (WK20707, Appendix 2.2).

Wooden platforms associated with burnt mound sites have also been excavated and analysed at other sites such as Derragh 1 (King, 2002). Wood from this platform comprised mainly of split alder wood, however ash, hazel and willow were also identified in smaller quantities. The oak identified from the wooden platform on this site is not comparable to other excavated platform sites where alder and ash are the main species identified from the platform structures. Platform (**C10**) was quite substantial in size and may have functioned as a dry flat area where activities like the preparation or eating of food was carried out. Oak is also not normally a dominant species identified from late Bronze Age dated sites. The fact that this platform was constructed of oak may give it a higher status or it may have performed a different function to the other analysed platforms.

The waste material associated with the workings of the site resulted in the burnt mound. A total of seventy six lithics were recovered from the site, thirteen were topsoil finds and the remainder came from burnt mound context (**C9**). These flint finds were included in the lithic assemblage recovered at this site, which was sent for specialist analysis. The collection of flint finds recovered on site most likely dates to later phases of the middle Neolithic or early phases of the late Neolithic period. The use of a predominantly scalar technology is particularly common in the final stages of the Neolithic period, particularly in the south half of the island of Ireland and is the basis of the suggested dating of the assemblage. Bipolar technology is scarce in this assemblage (Sternke, Appendix 2.3). The burnt spread represented the remains of firing debris traditionally heaped up around the trough in a 'horseshoe' shape at burnt mound or *fulacht fiadh* sites. It is likely that as no surface expression of this site remained, that the mound has been gradually flattened by agricultural practices.

5.4 Summary of Specialist Analysis

A number of specialists provided analysis of samples and artefacts recovered from the site as part of the post-excavation works. This work in part formed the basis for the dating evidence for the site. The detailed reports on the results of all analysis are detailed in Appendix 2.

5.4.1 Wood and Charcoal Analysis – Ellen O'Carroll

Charcoal and wood was analysed from this site. Ash brushwood was the only species identified from the charcoal remains associated with the wooden platform. The most commonly occurring wood species was oak which accounted for all of the platform timbers identified and two of the trough timbers identified. Two of the trough timbers were identified as alder. Ash was used in the manufacture of the post associated with the wooden platform.

There were eight oak half splits, three radial splits and three indeterminate split oak timbers recorded on the analysed timbers. The narrow restricted age range indicate that the oak wood may have been selected from a similar stand of trees possibly coppice woods.

One of the vertical timbers (posts) used in the construction of the platform was of ash. It was chisel pointed and was fashioned from a slow growing ash tree. Apart from the fact that the post was pointed there was no other woodworking evidence noted on the posts. All of the timbers from the trough and the platform were split from their parent trees (O'Carroll 2007).

5.4.2 Radiocarbon Dating

A sample of oak from wood platform (C10) was sent for C14 dating and returned a date of 3000 +/- 52BP. This gave a two sigma radiocarbon date range of 1400–1050BC placing this activity in the middle Bronze Age period (WK20707, Appendix 2.2)

5.4.3 Lithic Analysis

The lithic finds from this site are predominantly waste flakes from a lithic production involving a scalar technology which is typical for the southeast region. The assemblage can be dated to the Neolithic period based on technological and typological grounds. This assemblage might be linked to other Neolithic activity in the area and may have been associated with domestic activities at this site.

The lithic assemblage at this site makes an important contribution to the hitherto scarce evidence for Neolithic settlement along the east Wicklow coast (Sternke 2007).

5.5 Discussion

This site appears to be related to several other sites in the area as part of a complex of burnt mounds. This complex was made up of the present site (Site A022/043) and Sites A022/044, 045, 046, 047 and 048.

The area around Site A022/046, which contained a double walled wicker lined trough, appeared to have been in use over a considerable period of time with evidence for early and middle Bronze Age as well as Beaker activity being recovered. Site A022/044 dated to the middle Bronze Age and Sites A022/045 and A022/046 dated to the later Bronze Age. Sites A022/048 and 049, at the northern end of this group of burnt mounds, were undated. This complex of burnt mound sites is evidence of intense activity in the middle and late Bronze Age. It is possible that associated settlement sites were located on the higher ground to the east and west of the CPO boundary.

The presence of the Neolithic lithic assemblage is not consistent with the radiocarbon date for the site which has given a middle Bronze Age date. This could imply that the lithic assemblage is associated with earlier Neolithic activity in the vicinity of this site.

The results of the excavation are not unexpected given the nature of the physical landscape and the archaeological landscape which shows several complexes of typologically similar sites to the north and the south.

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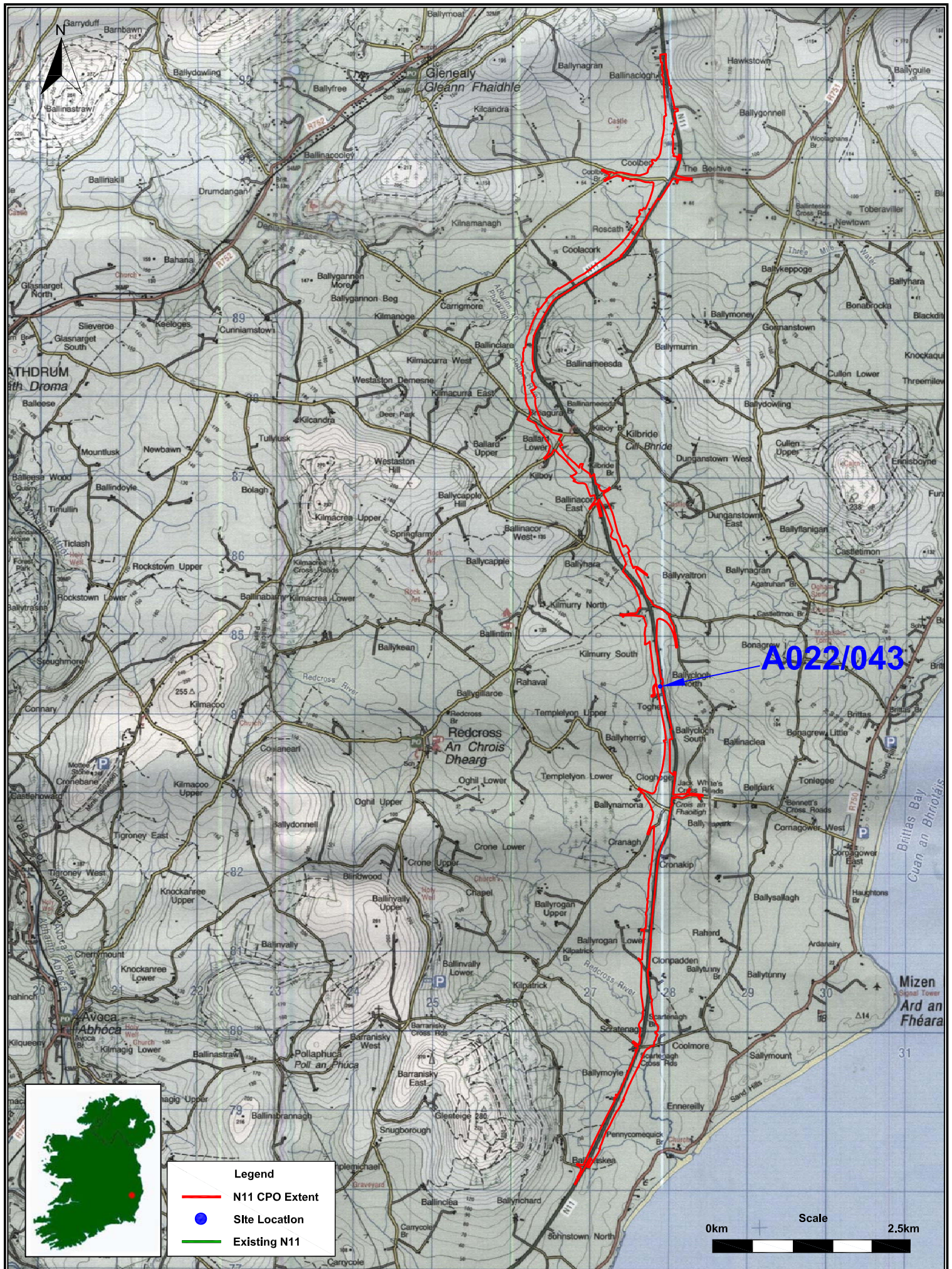
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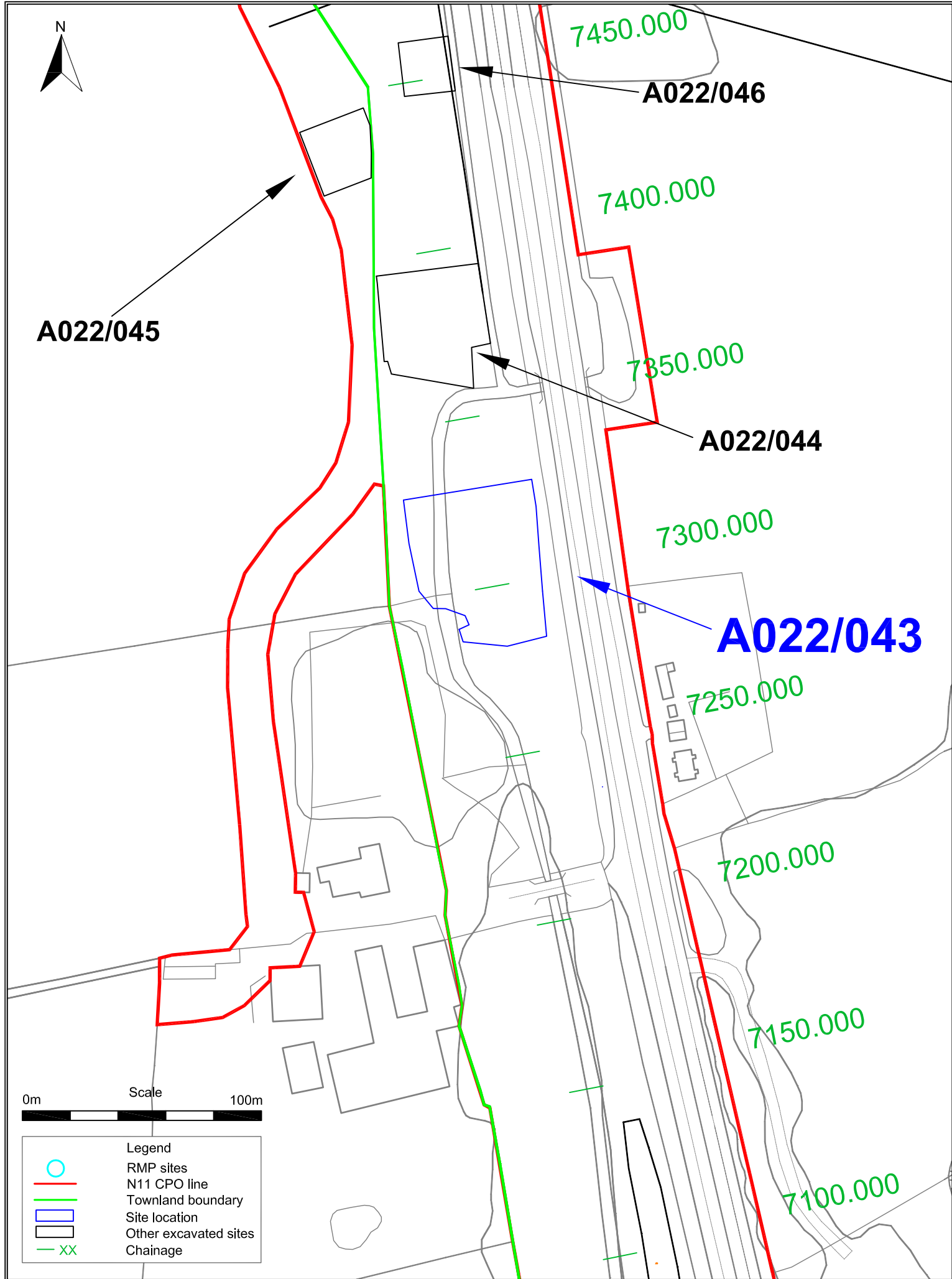
Other Sources

Record of Monuments and Places (RMP), The Department of the Environment, Heritage and Local Government, 7 Ely Place Upper, Dublin 2.

Topographical Files of the National Museum of Ireland, Kildare Street, Dublin 2.



Legend	
—	N11 CPO Extent
●	Site Location
—	Existing N11



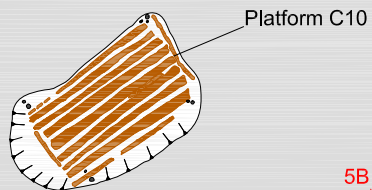
Legend

- RMP sites
- N11 CPO line
- Townland boundary
- Site location
- Other excavated sites
- Chainage

	Title: Site A022/043 E3229, showing detail of site within development	Scale: 1:2000 @A4
	Project: N11 Rathnew to Arklow Road Improvement	Date: 17/12/09
	Client: Wicklow County Council	Produced by: P Higgins
		Job No: J2283
		Figure No: 3

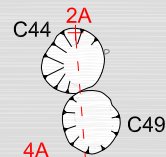


Limit of burnt mound C9



Platform C10

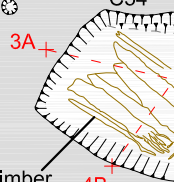
28.671



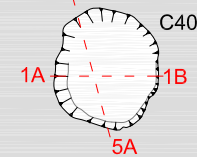
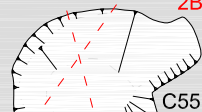
Posthole C57

Trough C54

Timber lining C42



Trough C54



327860,
184371

28.871

327860,
184361

327850,
184361

Limit of Excavation

Scale

0m

5m

Legend

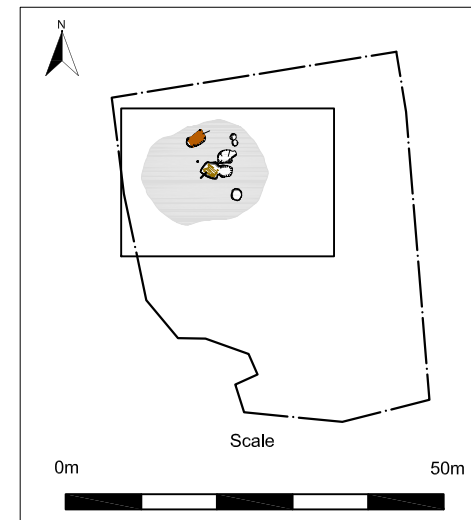
- Break of slope
- - - Sections
- Cxx Cut numbers
- Burnt mound deposits
- Timbers
- Stone
- xx.xx Levels - metres OD
- + xxxxxx National grid reference

IAC Irish Archaeological Consultancy

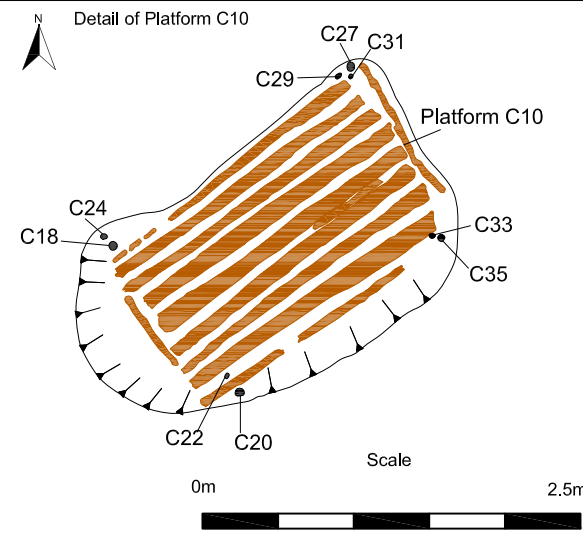
Title: Site A022/043 E3229, plan of site
Project: N11 Rathnew to Arklow Road Improvement
Client: Wicklow County Council

Scale: 1:100 @ A4
Date: 15/12/09
Produced by: G Kearney
Job No: J2283
Figure No: 4

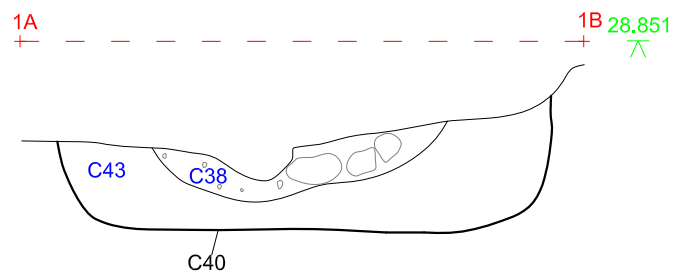
Location of Plan



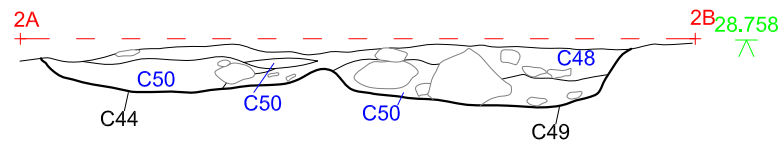
Detail of Platform C10



South facing section of C40



West facing section of C49



Legend

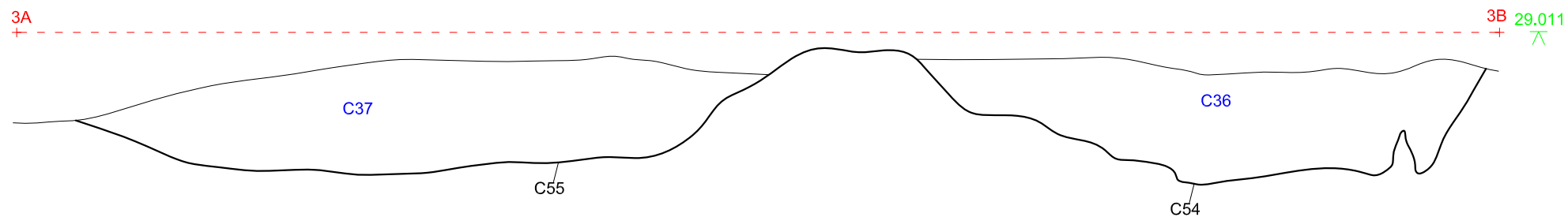
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
#	Charcoal
xx.xx	Levels - metres OD



IAC Irish Archaeological
Consultancy

Title:	Site A022/043 E3229, Sections through [C40], [C44] and [C49]
Project:	N11 Rathnew to Arklow Road Improvement
Client:	Wicklow County Council

Scale:	1:20 @A4
Date:	15/12/09
Produced by:	G Kearney
Job No:	J2283
Figure No:	5

Northwest facing section of C55

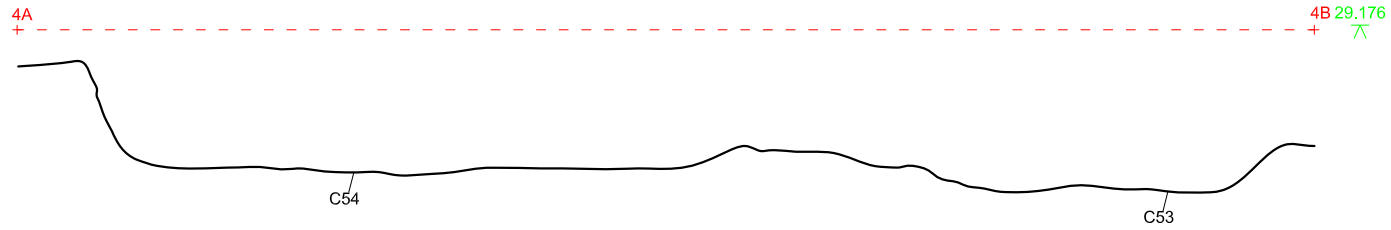


Legend	
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
#	Charcoal
xx.xx	Levels - metres OD
	

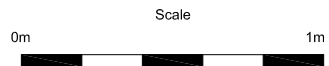
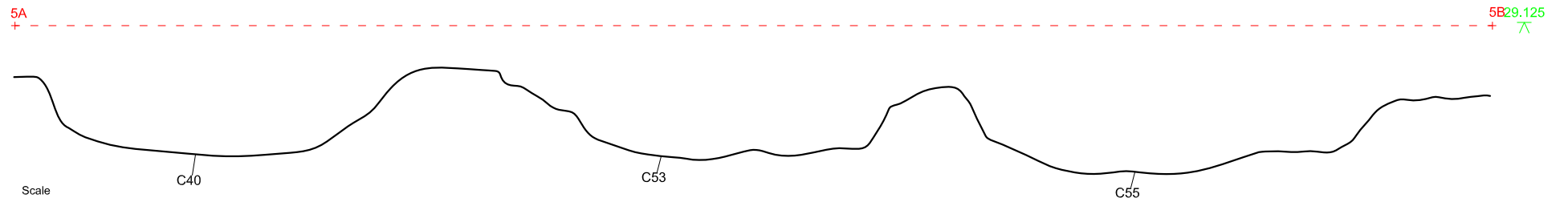
IAC Irish Archaeological Consultancy

Title:	Site A022/043 E3229, Section through [C54] and [C55]	Scale:	1:20 @A4
Project:	N11 Rathnew to Arklow Road Improvement	Date:	15/12/09
Client:	Wicklow County Council	Produced by:	G Kearney
		Job No:	J2283
		Figure No:	6

Profile of C54,C55



Profile of C40,C53,C55



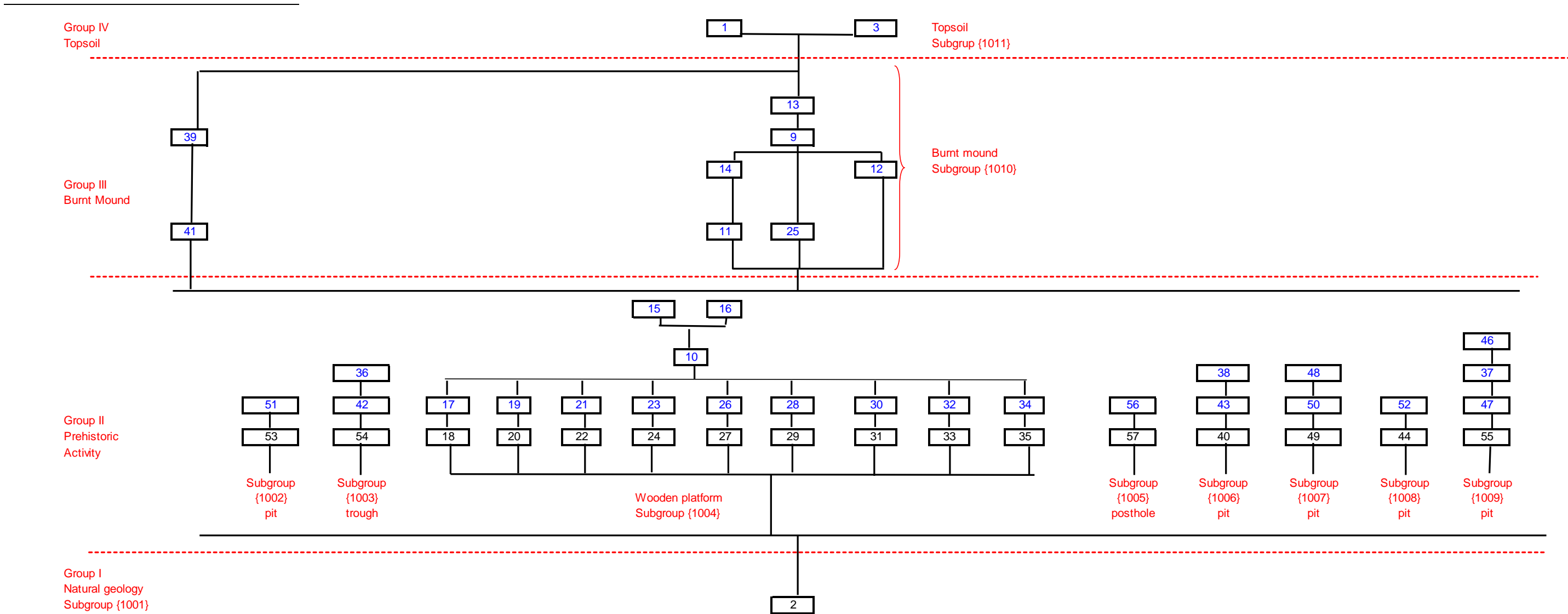
Legend


Cxx	Cut numbers
Cxx	Fill numbers
○	Stone
#	Charcoal
xx.xx	Levels - metres OD
^	

IAC Irish Archaeological
Consultancy

Title:	Site A022/043 E3229, Profiles through [C53], [C54], [C55] and [C40]
Project:	N11 Rathnew to Arklow Road Improvement
Client:	Wicklow County Council

Scale:	1:25 @A4
Date:	15/12/09
Produced by:	G Kearney
Job No:	J2283
Figure No:	7

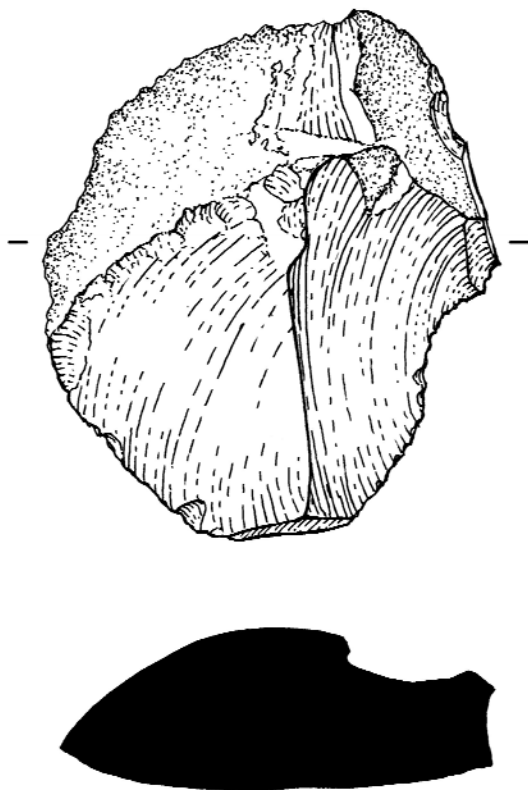


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Project: N11 Rathnew to Arklow Road Improvement		
Client: Wicklow County Council		
Scale: N.T.S. @A3	Job No: J2283	
Date: 14/01/10	Figure No: 8	
Produced by: P Higgins		

43:1:6



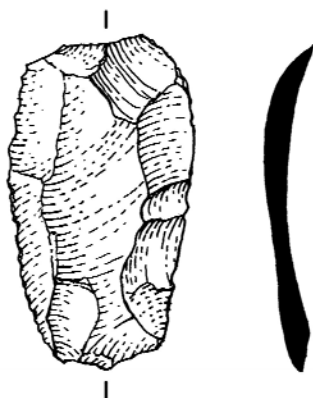
43:9:1



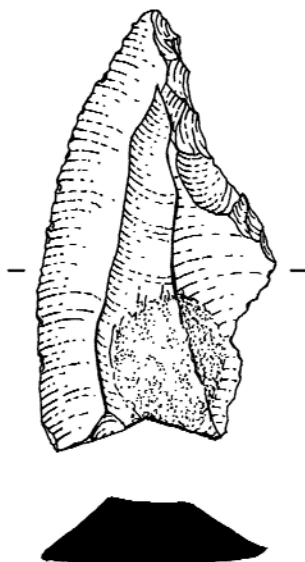
43:9:9



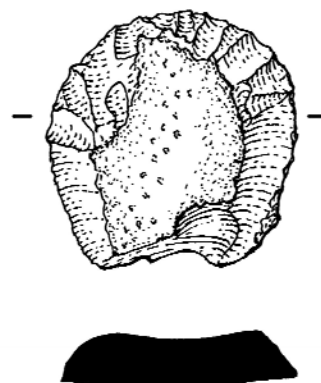
43:9:53



43:9:54



43:9:57



0m Scale 50mm



Plate 1 Trough [C54] (left) and associated pit [C55] (right) pre-excitation,
facing west



Plate 2 Trough [C54] mid-excitation, facing east



Plate 3 Trough [C54] following removal of fills showing timber lining (C42),
facing west

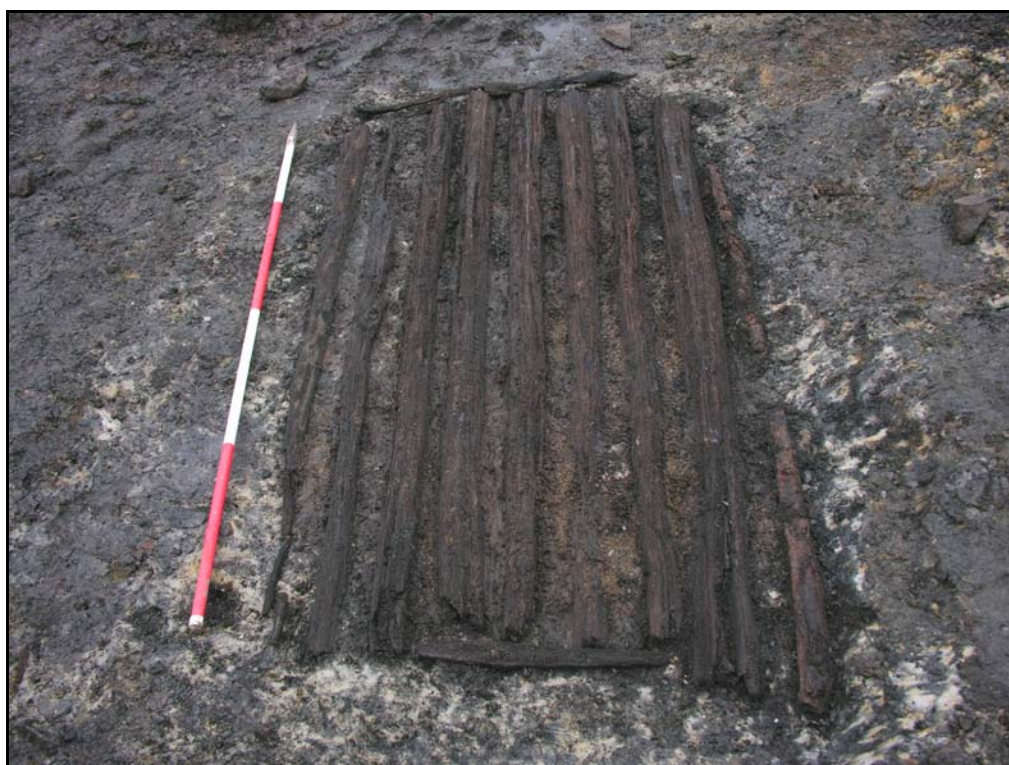


Plate 4 Timber platform (C10) mid-excavation, facing northeast



Plate 5 Timber platform (**C10**) mid-excavation, facing southwest



Plate 6 Stakeholes [**C18**] and [**C24**] pre-excavation, facing southeast



Plate 7 Posthole [C57] post excavation, facing west



Plate 8 Pit [C49] (left) and [C44] (right) post excavation, facing west



Plate 9 North facing section of burnt mound



Plate 10 Site pre-excitation facing east

APPENDIX 1: CATALOGUE OF PRIMARY DATA

Appendix 1.1: List of Contexts

Context	Type	Definition	Group	Subgroup	Subgroup Summary	Depth (m)	Length (m)	Width (m)
1	Topsoil	Topsoil	4	1011	Topsoil	-	-	-
2	Subsoil	Subsoil	1	1001	Natural drift geology	-	-	-
3	Topsoil	Same C1 Topsoil	4	1011		-	-	-
4-8	Void							
9	Spread	Burnt mound material	3	1010	Burnt mound	0.34	16.10	12.55
10	Wooden platform	Part of wood - lined timber trough.	2	1004	Wooden Platform	0.10	2.1	1.24
11	Fill	Natural deposition of mottled sand, associated with iron panning and water leeching activity	1	1001	Natural drift geology	0.26	8.6	-
12	Fill	Re-deposited clay.	3	1010	Burnt mound	0.40	-	0.60
13	Layer	Burnt mound material	3	1010	Burnt mound	0.28	13	4.45
14	Layer	decayed peat-like material	3	1010	Burnt mound	0.24		3.9
15	Layer	Deposit created from silting and seepage from timber water-containing trough above.	2	1004	Wooden Platform	0.04	2.0	0.60
16	Layer	Silting deposit situated around timbers 1 - 5	2	1004	Wooden Platform	0.04	2.0	0.65
17	Fill	Fill of stakehole	2	1004	Wooden Platform	0.22	0.10	0.10
18	Cut	Cut of supporting stakehole for timber platform	2	1004	Wooden Platform	0.22	0.10	0.10
19	Fill	Fill of stakehole	2	1004	Wooden Platform	-	0.10	0.10
20	Cut	Cut of supporting stakehole for timber platform	2	1004	Wooden Platform	-	0.10	0.10
21	Fill	Fill of stakehole	2	1004	Wooden Platform	0.30	0.06	0.06

22	Cut	Cut of supporting stake hole for timber platform (c.10)	2	1004	Wooden Platform	0.30	0.06	0.06
23	Fill	Fill of stakehole	2	1004	Wooden Platform	0.10	0.07	0.07
24	Cut	Cut of supporting stakehole for timber platform	2	1004	Wooden Platform	0.10	0.07	0.07
25	Layer	Natural deposit under C9	1	1001	Natural drift geology	0.1	1.9	-
26	Fill	Fill of stakehole	2	1004	Wooden Platform	0.15	0.10	0.10
27	Cut	Cut of stakehole	2	1004	Wooden Platform	0.15	0.10	0.10
28	Fill	Fill of stakehole	2	1004	Wooden Platform	0.25	0.08	0.06
29	Cut	Cut of stakehole	2	1004	Wooden Platform	0.25	0.08	0.06
30	Fill	Fill of stakehole	2	1004	Wooden Platform	0.15	0.04	0.04
31	Cut	Cut of stakehole	2	1004	Wooden Platform	0.15	0.04	0.04
32	Fill	Fill of stakehole	2	1004	Wooden Platform	0.16	0.10	0.07
33	Cut	Cut of stakehole relating to the grouping of stakeholes supporting c.10	2	1004	Wooden Platform	0.16	0.10	0.07
34	Fill	Fill of stakehole	2	1004	Wooden Platform	-	0.15	0.12
35	Cut	Cut of stakehole	2	1004	Wooden Platform	-	0.15	0.12
36	Fill	Fill of trough	2	1003	Trough C54	0.36	2.2	2.5
37	Layer	Burnt mound material	2	1009	Pit C55	0.04	2.0	2.4
38	Fill	Fill of pit	2	1006	Pit C40	0.12	0.86	0.75
39	Deposit	Burnt mound material	3	1010	Burnt mound	0.11	3.20	3.10
40	Cut	Cut of pit	2	1006	Pit C40	0.30	1.6	1.3


41	Deposit	Thin layer under burnt mound material	3	1010	Burnt mound	0.18	5.40	4.30
42	Timber lining	Timber lining of trough	2	1003	Trough C54	0.1	1.7	1.2
43	Fill	Fill of pit	2	1006	Pit C40	0.3	1.6	1.3
44	Cut	Cut of pit	2	1008	Pit C44	0.12	0.81	0.74
45	cancelled							
46	Spread	Upcast from digging of pit C55	2	1009	Pit C55	0.28	3.30	2.20
47	Fill	Fill of pit	2	1009	Pit C55	0.15	0.9	0.54
48	Fill	Fill of pit	2	1007	Pit C49	0.09	0.72	0.64
49	Cut	Cut of pit	2	1007	Pit C49	0.09	0.80	0.76
50	Fill	Fill of pit	2	1007	Pit C49	0.15	0.80	0.76
51	Fill	Fill of pit	2	1002	Pit C53	0.33	1.9	1.6
52	Fill	Fill of pit	2	1008	Pit C44	0.12	0.81	0.74
53	Cut	Cut of pit, truncated by trough c.54	2	1002	Pit C53	0.33	1.9	1.6
54	Cut	Cut of trough	2	1003	Trough C54	0.5	2.3	2.3
55	Cut	Cut of pit	2	1009	Pit C55	0.38	2.48	1.8
56	Fill	Fill of posthole	2	1005	Posthole C57	0.21	0.24	0.23
57	Cut	Cut of posthole	2	1005	Posthole C57	0.21	0.24	0.23

Appendix 1.2: Artefact Catalogue

Find No.	Context	Material	Description
E3229/A022/043:1:1	1	Flint	Flake
E3229/A022/043:1:2	1	Flint	Core
E3229/A022/043:1:3	1	Flint	Retouched Flake
E3229/A022/043:1:4	1	Flint	Flake
E3229/A022/043:1:5	1	Flint	Flake
E3229/A022/043:1:6	1	Flint	Arrowhead
E3229/A022/043:1:7	1	Flint	Debitage
E3229/A022/043:1:8	1	Stone	Unworked
E3229/A022/043:1:9	1	Flint	Flake
E3229/A022/043:3:1	3	Flint	Flake
E3229/A022/043:3:2	3	Flint	Flake
E3229/A022/043:3:3	3	Flint	Debitage
E3229/A022/043:3:4	3	Flint	Retouched Flake
E3229/A022/043:9:1	9	Flint	Retouched Flake
E3229/A022/043:9:2	9	Flint	Flake
E3229/A022/043:9:3	9	Flint	Flake
E3229/A022/043:9:4	9	Flint	Flake
E3229/A022/043:9:5	9	Flint	Flake
E3229/A022/043:9:6	9	Flint	Core
E3229/A022/043:9:7	9	Flint	Flake
E3229/A022/043:9:8	9	Flint	Flake
E3229/A022/043:9:9	9	Flint	Scraper
E3229/A022/043:9:10	9	Flint	Flake
E3229/A022/043:9:11	9	Flint	Natural Chunk
E3229/A022/043:9:12	9	Flint	Core
E3229/A022/043:9:13	9	Flint	Flake
E3229/A022/043:9:14a	9	Flint	Flake
E3229/A022/043:9:14b	9	Flint	Debitage
E3229/A022/043:9:15	9	Flint	Natural Chunk
E3229/A022/043:9:16	9	Flint	Flake
E3229/A022/043:9:17	9	Flint	Flake
E3229/A022/043:9:18	9	Flint	Flake
E3229/A022/043:9:19	9	Flint	Polished Flake
E3229/A022/043:9:20	9	Flint	Flake
E3229/A022/043:9:21	9	Flint	Scraper
E3229/A022/043:9:22	9	Flint	Flake
E3229/A022/043:9:23	9	Flint	Flake
E3229/A022/043:9:24	9	Flint	Flake
E3229/A022/043:9:25	9	Flint	Flake
E3229/A022/043:9:26	9	Flint	Flake
E3229/A022/043:9:27	9	Flint	Debitage
E3229/A022/043:9:28	9	Flint	Flake
E3229/A022/043:9:29	9	Flint	Natural Chunk
E3229/A022/043:9:30	9	Flint	Flake

E3229/A022/043:9:31	9	Flint	Debitage
E3229/A022/043:9:32	9	Flint	Flake
E3229/A022/043:9:33	9	Flint	Flake
E3229/A022/043:9:34	9	Flint	Debitage
E3229/A022/043:9:35	9	Flint	Flake
E3229/A022/043:9:36	9	Flint	Debitage
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E3229/A022/043:9:40	9	Flint	Debitage
E3229/A022/043:9:41	9	Flint	Debitage
E3229/A022/043:9:42	9	Flint	Flake
E3229/A022/043:9:43	9	Flint	Core
E3229/A022/043:9:44	9	Flint	Core
E3229/A022/043:9:45	9	Flint	Flake
E3229/A022/043:9:46	9	Flint	Retouched Flake
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E3229/A022/043:9:48	9	Flint	Flake
E3229/A022/043:9:49	9	Flint	Retouched Flake
E3229/A022/043:9:50	9	Flint	Retouched Flake
E3229/A022/043:9:51	9	Flint	Flake
E3229/A022/043:9:52	9	Flint	Flake
E3229/A022/043:9:53	9	Flint	Retouched Flake
E3229/A022/043:9:54	9	Flint	Distally Trimmed Blade
E3229/A022/043:9:55	9	Flint	Flake
E3229/A022/043:9:56	9	Flint	Too small for analysis
E3229/A022/043:9:57	9	Flint	Scraper
E3229/A022/043:9:58	9	Flint	Core
E3229/A022/043:9:59	9	Flint	Retouched Flake
E3229/A022/043:9:60	9	Flint	Flake
E3229/A022/043:9:61	9	Flint	Natural Chunk
E3229/A022/043:9:62	9	Flint	Flake
E3229/A022/043:37:56	37	Flint	Flake

Appendix 1.3: Archive Index

Project: N11 Rathnew To Arklow Road Improvement	Irish Archaeological Consultancy Ltd	
Site Name: Ballyclogh North		
Ministerial Number: A022/043		
Site director: Yvonne Whitty		
Date: May 2009		
Field Records	Items (quantity)	Comments
Site drawings (plans)	12	
Site sections, profiles, elevations	7	
Other plans, sketches, etc.		
Timber drawings		
Stone structural drawings		
Site diary/note books	1	
Site registers (folders)	5	
Survey/levels data (origin information)		Plans, Digital also
Context sheets		
Wood Sheets		
Skeleton Sheets		
Worked stone sheets		
Digital photographs	57	
Photographs (print)		
Photographs (slide)		
Finds and Environ. Archive		
Flint/chert	75	
Stone artefacts	1	
Pottery (specify periods/typology)		
Ceramic Building Material (specify types eg daub, tile)		
Metal artefacts (specify types - bronze, iron)		
Other find types or special finds (specify)		
Human bone (specify type eg cremated, skeleton, disarticulated)		
Animal bone		
Metallurgical waste		
Enviro bulk soil (specify no. of samples)	25 (timber) 2 (charcoal) 1 possible lead ore 12 soil samples	
Enviro monolith (specify number of samples and number of tins per sample)		
Security copy of archive	Yes	Digitised

APPENDIX 2: SPECIALIST REPORTS

- Appendix 2.1: Wood And Charcoal Report – Ellen O'Carroll
Appendix 2.2: Radiocarbon Dating Report – University of Waikato
Appendix 2.3: Lithic Report – Farina Sternke

APPENDIX 2.1: WOOD AND CHARCOAL REPORT – ELLEN O’CARROLL

AN ANALYSIS OF THE WOOD AND CHARCOAL EXCAVATED FROM A TROUGH AND A PLATFORM AT BALLYCLOGH NORTH TOWNLAND, CO. WICKLOW A022/043

**JUNE 2007
ELLEN O’CARROLL**

CONTENTS

1. Introduction
2. Methods
3. Definitions of Element Types and woodworking terminology
4. Description of feature type
5. Results
6. Discussion of Wood & Charcoal Assemblage
7. Comparative material
8. Conclusions on Wood & Charcoal Assemblage
9. Woodworking evidence
10. References

List of Tables & Figures

Table 1: Taxa identified from charcoal samples

Figure 1: Results from wood identifications at site A022/043

Appendix: *Catalogue of identified wood & Charcoal*

1. INTRODUCTION

In recent years there has been a considerable amount of structural as well as non-structural wood recovered from archaeological deposits in Ireland. Wood was a vital and widely used raw material from prehistoric to medieval times although its importance is rarely reflected in the analysis of archaeological assemblages mainly due to its perishable nature. It is important to note that people in prehistoric, early Christian and medieval communities were mainly dependant on woodland resources for the construction of buildings and for the manufacture of most implements. The woods in a surrounding catchment area were exploited and often managed to provide an essential raw material for the community. The economic importance of wood cannot be over estimated. A study of the range of species on an archaeological site offers us an indication of the composition of local woodland in its period of use.

Large assemblages of wood from the numerous road schemes are currently under excavation and subsequent analysis of the sampled wood is currently on-going in Ireland. To date none of this analysis is published therefore comparisons are somewhat difficult. From preliminary analysis of some of these assemblages it is clear that oak was the most common species used for wall-posts and planks, hazel was preferred for wattle structures and species such as ash, willow, alder, birch and holly were utilised for a variety of other structural requirements. Alder and oak are the most frequent species used in the construction of plank lined troughs while hazel and ash are selected for posts also used in the construction of wattle troughs. The work undertaken here at Ballyclogh will add important information to the rapidly expanding database of environmental indicators particularly in relation to the Bronze Age period of the area. This area of work is especially important in Ireland where there were no written records up to the 18th century relating to the amount and type of woodland (McCracken 1971, 15).

Twenty two wood samples and one charcoal sample were analysed by the author. A two sigma radiocarbon date of 1400-1050 BC was returned from wooden platform (C10) dating this assemblage to the middle Bronze Age (WK20707, Appendix 2.2). The wood was sampled from the trough lining (C42) which had a rectangular shape in plan and was constructed from split side and floor timbers. A wooden platform (C10) was also analysed within the framework of this study. The charcoal was sampled from (C10) the wooden platform.

The analysis presented here concentrates on species identification, species selection and the composition of the local woodland during the middle Bronze Age period in the area surrounding Ballyclogh North. Woodworking analysis which is sometimes a useful indicator of tool types being used was also undertaken.

2. METHODS

The process for identifying wood, whether it is charred, dried or waterlogged is carried out by comparing the anatomical structure of wood samples with known comparative material or keys (Schweingruber 1990). Thin slices were taken from the transversal, tangential and longitudinal sections of each piece of wood and sampled using a razor blade. These slices were then mounted on a slide and glycerine was painted onto the wood to aid identification. Each slide was then examined under a microscope at magnifications of 10x to 250x. The identification of charcoal material involves breaking the charcoal piece so as a clean section of the wood can be obtained. This charcoal is then identified to species under an Olympus stereomicroscope with a magnification of 200. By close examination of the microanatomical features of the samples the species were determined. The diagnostic features used for the identification of wood are micro-structural characteristics such as the vessels and their arrangement, the size and arrangement of rays, vessel pit arrangement and also the type of perforation plates.

All wood samples were washed and recorded on wood working sheets on site and then wrapped in cling film for further analysis. Where appropriate, the samples were measured and described in terms of their function and wood technology (see appendix). Species identification and ring width analysis were completed in the laboratory. The wooden lining (C42) from the trough (C54) was in very poor condition and in some instances only scraps and fragments of wood were remaining to analyse. Measurements for (C42) were taken from the sheets and are projected lengths along the line of the fragments of the wood.

The points of the samples from (C19) were recorded to determine if there was any preference of one point type over another. The points enabled the posts to be driven easily into the soil. The cutting angles of the points were also recorded to reconstruct whether the inhabitants had an efficient metal tool to enable them to sharpen the point to different angles (O Sullivan 1996, 319).

An individual toolmark is referred to as a facet and a complete toolmark leaves behind an impression called a jam curve. Toolmarks, facets, facet junctions and jam curves were noted and measured with callipers. The length and width of one facet from each piece of worked wood was recorded (Appendix 1). Each toolmark was also examined for its degree of concavity i.e. whether it was flat, slightly concave or concave in profile. This observation is important particular in relation to differentiating stone and metal axes.

3. DEFINITIONS OF ELEMENT TYPES AND WOODWORKING TERMINOLOGY

Constructional Elements

<i>Brushwood:</i>	Stems or rods measuring 6 cm or less in diameter.
<i>Roundwood:</i>	A piece of worked or unworked wood in the round and over 6 cm in diameter.
<i>Vertical Stake/Post:</i>	Upright brushwood or roundwood driven vertically or at an angle into the ground. Sometimes but not always used for stabilization.
<i>Horizontal:</i>	Brushwood/roundwood or split timber laid flat on the ground.
<i>Twigs:</i>	Small shoots or branches measuring around 1 cm in diameter.
<i>Split timber:</i>	Wood converted from the round including planks, half splits and split pegs.

Woodworking terms and definitions

<i>Chisel point:</i>	The end of a piece of wood cut to a point on one single face.
<i>Conversion:</i>	The way in which the primary trunk has been split into smaller elements.
<i>Facet:</i>	The cut surface produced on a piece of wood by a tool blow. The blow can leave behind a particular signature if the cutting edge of the tool is flawed.
<i>Facet junction:</i>	The nature of the junctions between each facet was also assessed as to whether they were clean, ragged or stepped
<i>Jam curves:</i>	A complete toolmark on wood retaining the impression of the complete width of the blade used

Pencil point: The end of a piece of wood cut to a point on one multiple faces.

Wedge point: The end of a piece of wood cut to a point on one two faces.

4. DESCRIPTION OF FEATURE TYPE

Context (C42) comprised the remains of a wooden lining within sub oval trough [C54] which measured 2.2m long, 2m wide and 0.5m in depth. The cut was rectangular in plan with rounded corners. The trough had a northwest-southeast orientation with a gradual break of slope at top. The sides were steeply sloped on the north side and diagonal and there was a gradual break of slope at the base which was flat. The trough contained two fills, (C42) and (C36). The base and sides of the trough were lined with planks which were in a very poor state of preservation. The side planks were recorded as : T1,4,5,6 and 9 -while the base planks were recorded as T2,3,7 and 8.

Context (C10) represents a wooden platform which was located to the northwest of the trough and was sealed by the burnt mound material. The platform was placed on the natural subsoil. The platform was a rectangular shaped feature, which was northeast-southwest orientated and measured 2.2m in length and 1.3m in width. The platform was constructed with nine oak half split roundwood planks. The wood was in a very good state of preservation and two possibly hazel pegs were driven into the natural at each corner to hold the platform in place. A peg was also identified from [C19] which is a vertical post associated with the wooden platform.

5. RESULTS

A total of 22 wood samples and one charcoal sample was analysed with regard to species identification, species selection and wood working technology. Two samples from the trough lining (C42) were unidentifiable due to their desiccated nature.

Site No.	Context No.	Sample No.	Species Type	Comment and Weight
43	10	16	ash brushwood (14-20yrs)	11grammes

Table 1: Taxa identified from charcoal samples

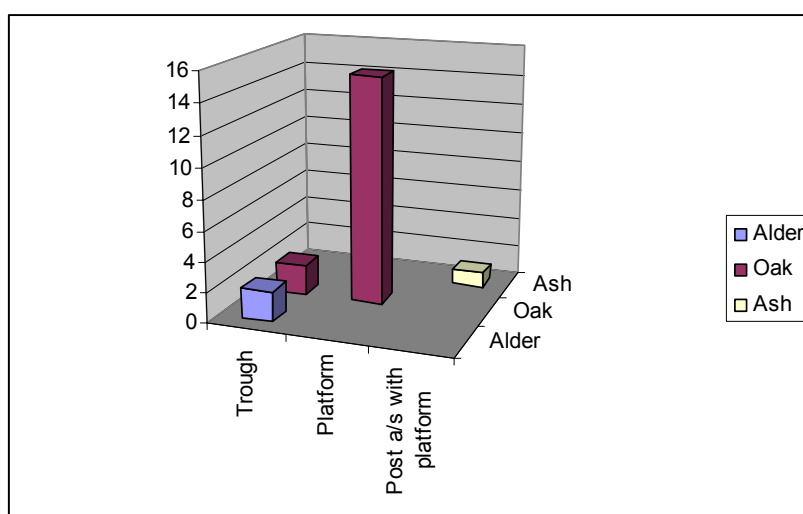


Figure 1: Results from wood identifications at site A022-43

Oak (*Quercus sp*) was by far the most dominant species which occurred in the assemblage. The platform was constructed from all oak split planks while the trough was constructed from two alder (*Alnus glutinosa*) and two oak planks. The one post analysed from the platform was identified as ash (*Fraxinus excelsior*). The charcoal also identified from remains associated with the wooden platform was identified as ash brushwood of 14 to 20 years in age.

The Platform C10

All of the timbers identified from the platform were of oak (*Quercus spp*). Overall the oak wood was in good condition and the timbers measured between 15 and 4cm in width and between 2.07 metres and 10cm in length. There were eight half splits, three radial splits and three indeterminate split logs recorded on the analysed timbers. In radial conversion, the roundwood is divided into planks along the natural radial axis from the centre of the log towards the bark. In tangential conversion, roundwood is divided into planks across the log, taking no advantage of the anatomy of the wood. Half splits are split through the very centre of the tree to form semi-circular shaped timbers. The flat surface would have been used as the walking or preparatory surface for different functions associated with the platform. The age range of the oak timbers were restricted to between 21 and 25yrs which suggests that the wood was all selected from the same stand of trees. These may have been coppiced oak trees.

Ash charcoal was also identified from a sieved soil sample associated with C10. The ash consisted of brushwood with 14 – 20 annual tree rings present on the charcoal fragments.

The Post C19

The ash (*Fraxinus excelsior*) post measured 7cm in width and 42cm in length. It was chisel pointed at an angle of 20° and was shown to have a slow growth rate. There were 62 annual tree rings present on the post.

The Trough Lining C42

One side timber was constructed of oak and one as alder. A similar scenario is also seen in the analysis of the base timbers where one is of alder (*Alnus glutinosa*) and one is of oak (*Quercus spp*). All the side and base timbers of the trough were half splits.

The size range for the alder wood from the trough averaged 4 cm in diameter and lengths ranged from 1.46 to 0.58 meters. The alder wood was too degraded to count their annual rings. The oak wood ranged from 15 to 5 cm in diameter and 1.41 to 1.60 metres in length. The two oak timbers had 30 and 35 annual tree rings present and were of a moderate growth rate.

6. DISCUSSION OF WOOD & CHARCOAL ASSEMBLAGE

Three taxa were present in the wood samples from Ballyclogh North A022/043. The most commonly occurring species was oak (*Quercus sp*) which accounted for all of the platform timbers identified and two of the trough timbers identified. Two of the trough timbers were identified as alder (*Alnus glutinosa*) and ash was used in the manufacture of the post. Ash charcoal was also identified from the assemblage.

The trees and shrubs listed above are all representative of mixed woodland conditions in Ireland. From the results above the local environment of the sites suggests both a dryland environment where open forests prevailed to support some large trees on good soils and a wetter area where alder and willow would have grown. The wood analysis indicates the site was located close to a wetland and dryland environment, which is a typical location for *fulacht fiadh* or burnt spread site.

There was a definite preference for oak wood in the construction of the platform and both alder and oak were used in equal amounts for the construction of the trough.

Oak *Quercus spp*

Fifteen half split and radial splits oak timbers were identified from the platform. It is not surprising that oak was selected for the construction of the timber platform as oak has excellent properties of great durability and strength and was frequently used for the production of planks, posts and stakes. Visual cross matching failed to identify conclusively if the split oak timbers were made from the same tree. Their restricted age profiles suggest that they may have been selected from the same stand of trees.

Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*) are both native and common to Ireland and the wood of these species cannot be differentiated on the basis of their anatomic characteristics. Pendunculate oak is found growing in areas of heavy clays and loams, particularly where the soil is alkaline. Sessile oak is found on acid soils and often in pure stands. Unlike pendunculate oak, it thrives on well drained soils but is tolerant of flooding (Beckett 1979, 40-41). Both species of oak grow to be very large trees (30-40m high) and they were the most important species of wood for the production of large timbers.

Alder *Alnus glutinosa*

Two horizontal half-split alder timbers lined the trough [C54]. They were in a poor degraded state therefore there was little evidence of woodworking present on the samples. It was also impossible to count the annual tree rings on the samples.

Alder is a widespread native tree and prefers wet habitats along stream and river banks. It is an easily worked and split timber and therefore quite commonly manufactured into planks.

Alder poles were a favourite timber for underground foundations in damp or wet conditions. It was used as piles under houses, bridges, boat jetties, canal lock gates, pumps and troughs. The timber can resist decay in a wet environment almost indefinitely. Venice floats partly on the strength of alder trees. However, it is not very good for fencing in dry land, since the wood seems to need the water to balance its fire power in order to remain solid. Alder fencing posts can rot within the year at the part between the earth and the air.

ASH *Fraxinus excelsior*

The post excavated and identified from (C10) was of ash wood as was the charcoal identified from the same feature.

Ash is a native species preferring lime-rich freely draining soils. It is not a very durable timber in waterlogged conditions but has a strong elastic nature. It is easily worked and lends itself well to a range of different requirements like the turning of wooden bowls.

7. COMPARATIVE MATERIAL

Wooden platforms associated with *fulacht fiadh* sites have also been excavated and analysed at Derragh 1 (01E0315), and Meeltran & Ballyhowley (00E0239) in Co. Mayo. Wood from these platforms comprised mainly of split alder wood although ash, hazel and willow were also identified albeit in smaller quantities. The oak identified from the wooden platform (C10) Ballyclogh North A022/043 is not comparable to other excavated platform sites where alder and ash are the main species identified from these platform structures. This platform was quite substantial in size and may have functioned as a dry flat area where certain activities like the preparation or eating of food was carried out. Oak is also not normally a dominant species identified

from middle Bronze Age dated sites. The fact that this platform was constructed of oak may give it a higher status or it may have performed a different function to the other analysed platforms.

Similar troughs have been identified from site A022/044 (C58) & A022/041 (C11) where alder was the main species also identified. In Charlesland, Co. Wicklow, charcoal and wood were analysed from four *fulachta fiadh* by O'Donnell, dating from the early to the late Bronze Age. Troughs, hearths, mounds, and a burnt spread were analysed from this site. The charcoal assemblage was dominated by ash, alder, willow and hazel. The wood from two of the *fulacht* sites was mainly alder along with some hazel.

8. CONCLUSIONS ON WOOD & CHARCOAL ASSEMBLAGE

Charcoal and wood was analysed from Ballyclogh North A022/043. Ash brushwood was the only species identified from the charcoal remains associated with the wooden platform. The most commonly occurring wood species was oak which accounted for all of the platform timbers identified and two of the trough timbers identified. Two of the trough timbers were identified as alder. Ash was used in the manufacture of the post associated with the wooden platform.

There were eight oak half splits, three radial splits and three indeterminate split oak timbers recorded on the analysed timbers. The narrow restricted age range indicates that the oak wood may have been selected from a similar stand of trees possibly coppice woods.

9. WOODWORKING EVIDENCE

One of the vertical timbers (posts) used in the construction of the platform was of ash. It was chisel pointed and was fashioned from a slow growing ash tree (Appendix). Apart from the fact that the post was pointed there was no other woodworking evidence noted on the posts. All of the timbers from the trough and the platform were split from their parent trees.

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Plate 1 Trough [C54] (left) and associated pit [C55] (right) pre-excitation,
facing west



Plate 2 Trough [C54] mid-excitation, facing east



Plate 3 Trough [C54] following removal of fills showing timber lining (C42),
facing west

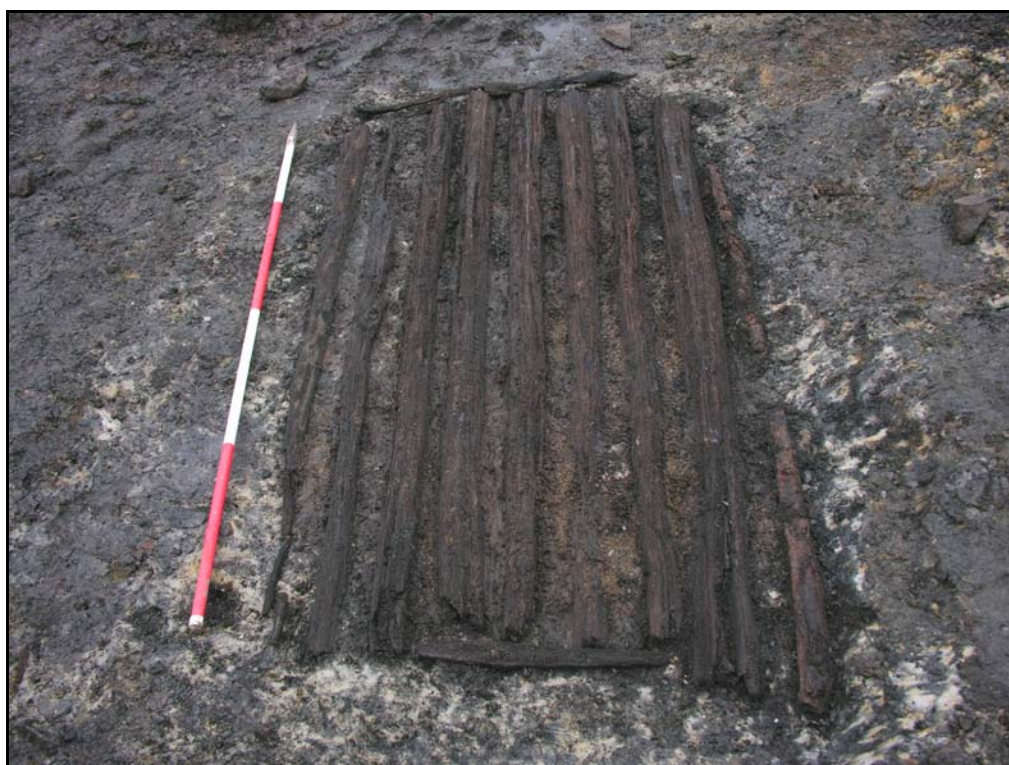


Plate 4 Timber platform (C10) mid-excavation, facing northeast



Plate 5 Timber platform (**C10**) mid-excavation, facing southwest



Plate 6 Stakeholes [**C18**] and [**C24**] pre-excavation, facing southeast



Plate 7 Posthole [C57] post excavation, facing west



Plate 8 Pit [C49] (left) and [C44] (right) post excavation, facing west



Plate 9 North facing section of burnt mound



Plate 10 Site pre-excitation facing east

APPENDIX

C	Sample No.	Sample Type	Species	Wood Quality	Diameter/ Width x Depth	Length	Age (yrs)	Growth	Woodworking	Point Type	Facet (cm)	Jam curve	Cutting Angle	Comment	Context Type
42	1	Horizontal	<i>Quercus</i> spp	Good	15 x 8cm	1.41cm	30+yrs	Moderate	Half split	N/A	N/A	N/A	N/A	Straight grained	Trough timber-side
42	2	Horizontal	<i>Quercus</i> spp	Fair	2.6 x 5cm	1.60m	35+	Moderate	Half split	N/A	N/A	N/A	N/A	Slightly knotty. Possibly charred	Trough timber-base
42	3	Horizontal	<i>Alnus glutinosa</i>	Poor	2.4 x 4cm	1.46m	Indeterminate	Indeterminate	Half split	N/A	N/A	N/A	N/A		Trough timber-base
42	4	Poss. vertical	Unidentifiable	Very Poor	9 x 6cm	64cm	Indeterminate	Indeterminate	Indeterminate	N/A	N/A	N/A	N/A		Trough timber-side
42	6	Horizontal	<i>Alnus glutinosa</i>	Very Poor	4 x 2cm	58cm	Indeterminate	Indeterminate	Half split	N/A	N/A	N/A	N/A		Trough timber-side
42	7	Horizontal	Unidentifiable	Very Poor	5.2 x 1cm	1.66m	Indeterminate	Indeterminate	Half split	N/A	N/A	N/A	N/A	Straight grained	Trough timber-base
10	1	Horizontal	<i>Quercus</i> spp	Good	9 x 2cm	1.47m	25yrs	Varied	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	2	Horizontal	<i>Quercus</i> spp	Good	7 x 3cm	1.99m	22yrs	Varied	Half split	N/A	N/A	N/A	N/A	Slightly knotty.	Platform
10	3	Horizontal	<i>Quercus</i> spp	Good	9 x 6cm	2.07m	23yrs	Varied	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	4	Horizontal	<i>Quercus</i> spp	Good	11 x 5cm	2.04m	25yrs	Varied	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	5	Horizontal	<i>Quercus</i> spp	Good	14 x 10cm	2.06m	23yrs	Moderate	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	6	Horizontal	<i>Quercus</i> spp	Good	10 x 7cm	2.05m	22yrs	Varied	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	7	Horizontal	<i>Quercus</i> spp	Good	6 x 3cm	0.48m	21yrs	Moderate		N/A	N/A	N/A	N/A		Platform
10	8	Horizontal	<i>Quercus</i> spp	Good	7 x 6cm	2.03m	23yrs	Moderate	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	9	Horizontal	<i>Quercus</i> spp	Good	15 x 13cm	2.05m	22yrs	Moderate	Half split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	10	Horizontal	<i>Quercus</i> spp	Poor	4 x 2cm	1.72m	Indeterminate	Indeterminate	Radial split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	11	Horizontal	<i>Quercus</i> spp	Good	6 x 6cm	0.46m	23yrs	Varied	Radial split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	12	Horizontal	<i>Quercus</i> spp	Fair	6 x 6cm	0.95m	22yrs	Moderate	Radial split	N/A	N/A	N/A	N/A	Straight	Platform

														grained	
10	13	Horizontal	<i>Quercus</i> spp	Poor	3 x 3cm	0.1m	Indeterminate	Varied	Split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	14	Horizontal	<i>Quercus</i> spp	Good	3 x 3cm	0.1m	Indeterminate	Moderate	Split	N/A	N/A	N/A	N/A	Straight grained	Platform
10	15	Horizontal	<i>Quercus</i> spp	Poor	2 x 2cm	0.1m	Indeterminate	Moderate	Split	N/A	N/A	N/A	N/A		Platform
19	1	Vertical post	<i>Fraxinus excelsior</i>	Poor	7cm	0.42m	62yrs	Slow	Yes	Chisel	No	No	20°		Platform
10	16	Charcoal	ash brushwood	Charcoal	N/A	N/A	14-20yrs	Fast	N/A					Burnt wood	Platform

APPENDIX 2.2: RADIOCARBON DATING REPORT – UNIVERSITY OF WAIKATO

The University of Waikato *Radiocarbon Dating Laboratory*



Private Bag 3105
Hamilton,
New Zealand.
Fax +64 7 838 4192
Ph +64 7 838 4278
email c14@waikato.ac.nz
Head: Dr Alan Hogg

Report on Radiocarbon Age Determination for Wk- 20707

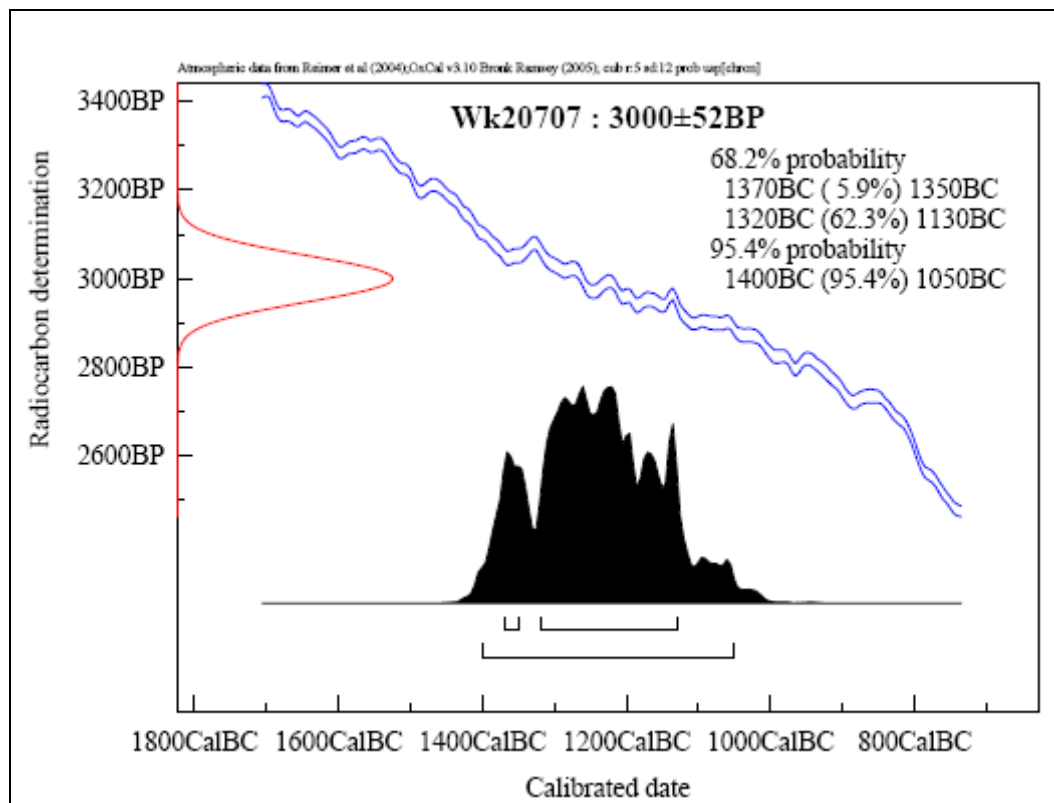
Submitter I Johnston
Submitter's Code A022/043 10/13
Site & Location N11 Rathnew – Arklow Project, Ireland
Sample Material Wood
Physical Pretreatment Surfaces scraped clean. The wood was washed in ultrasonic bath, then ground.
Chemical Pretreatment Sample was washed in hot 10% HCl, rinsed and treated with hot 0.5% NaOH. The NaOH insoluble fraction was treated with hot 10% HCl, filtered, rinsed and dried.

$\delta^{14}\text{C}$	-316.0 ± 4.4	‰
$\delta^{13}\text{C}$	-28.1 ± 0.2	‰
D^{14}C	-311.7 ± 4.4	‰
% Modern	68.8 ± 0.4	%
Result	3000 \pm 52 BP	

Comments


18/7/07

- Result is *Conventional Age* or % *Modern* as per Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier of 1.
- The isotopic fractionation, $\delta^{13}\text{C}$, is expressed as ‰ wrt PDB.
- Results are reported as % *Modern* when the conventional age is younger than 200 yr BP.



APPENDIX 2.3: LITHIC REPORT – FARINA STERNKE

N11 RATHNEW TO ARKLOW ROAD IMPROVEMENT

LITHICS FINDS REPORT FOR A022/043 BALLYCLOGH NORTH

Dr. Farina Sternke

MA, PhD

**Department of Archaeology
University College Cork**

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10

INTRODUCTION

Seventy-five lithic finds from the archaeological investigations of a Neolithic site along the route of the N11 Rathnew To Arklow Road Improvement at Ballyclogh North, were presented for analysis (Table 1). The finds are associated with the remains of a burnt spread.

Find Number	Context	Material	Type	Cortex	Condition	Length (mm)	Width (mm)	Thickn. (mm)	Complete	Retouch
A022/043:1:1	1	Flint	Flake	Yes	Slightly Patinated	22	30	6	No	No
A022/043:1:2	1	Flint	Core	Yes	Slightly Patinated	30	30	18	Yes	No
A022/043:1:3	1	Flint	Retouched Flake	Yes	Slightly Patinated	33	23	8	No	right edge inverse semiabrupt
A022/043:1:4	1	Flint	Flake	Yes	Patinated	29	24	10	Yes	No
A022/043:1:5	1	Flint	Flake	Yes	Patinated	18	22	4	Yes	No
A022/043:1:6	1	Flint	Arrowhead	No	Patinated	33	22	7	No	No
A022/043:1:7	1	Flint	Debitage							
A022/043:1:9	1	Flint	Flake	Yes	Patinated	28	24	4	Yes	No
A022/043:3:1	3	Flint	Flake	Yes	Patinated	29	21	7	No	No
A022/043:3:2	3	Flint	Flake	Yes	Patinated	51	36	9	Yes	No
A022/043:3:3	3	Flint	Debitage							
A022/043:3:4	3	Flint	Retouched Flake	Yes	Patinated	29	34	8	Yes	right edge direct abrupt
A022/043:9:1	9	Flint	Retouched Flake	Yes	Patinated	68	61	21	Yes	right edge direct one large flake
A022/043:9:2	9	Flint	Flake	Yes	Patinated	57	37	11	Yes	No
A022/043:9:3	9	Flint	Flake	Yes	Patinated	37	40	16	Yes	No
A022/043:9:4	9	Flint	Flake	Yes	Patinated	38	29	22	Yes	No
A022/043:9:5	9	Flint	Flake	Yes	Patinated	26	33	10	Yes	No
A022/043:9:6	9	Flint	Core	Yes	Patinated	35	32	17	Yes	No
A022/043:9:7	9	Flint	Flake	Yes	Patinated	43	51	39	Yes	No
A022/043:9:8	9	Flint	Flake	Yes	Slightly Patinated	38	44	12	No	No
A022/043:9:9	9	Flint	Scraper	Yes	Patinated	29	31	18	Yes	distal and right edge abrupt
A022/043:9:10	9	Flint	Flake	Yes	Patinated	32	36	12	Yes	No
A022/043:9:11	9	Flint	Natural Chunk							
A022/043:9:12	9	Flint	Core	Yes	Patinated	43	24	11	Yes	No
A022/043:9:13	9	Flint	Flake	Yes	Patinated	42	23	8	Yes	No
A022/043:9:14a	9	Flint	Flake	Yes	Patinated	31	24	7	No	No
A022/043:9:14b	9	Flint	Debitage							
A022/043:9:15	9	Flint	Natural Chunk							
A022/043:9:16	9	Flint	Flake	Yes	Patinated	25	16	4	No	No
A022/043:9:17	9	Flint	Flake	Yes	Patinated	23	25	5	Yes	No
A022/043:9:18	9	Flint	Flake	Yes	Patinated	15	36	5	No	No
A022/043:9:19	9	Flint	Polished Flake	No	Slightly Patinated	44	18	8	Yes	No
A022/043:9:20	9	Flint	Flake	Yes	Patinated	22	15	5	Yes	No
A022/043:9:21	9	Flint	Scraper	Yes	Patinated	28	22	5	Yes	distal direct abrupt, proximal direct semiabrupt
A022/043:9:22	9	Flint	Flake	Yes	Patinated	30	19	7	No	No
A022/043:9:23	9	Flint	Flake	No	Patinated	11	22	5	Yes	proximal inverse abrupt
A022/043:9:24	9	Flint	Flake	Yes	Patinated	18	21	5	Yes	No
A022/043:9:25	9	Flint	Flake	Yes	Patinated	24	17	10	No	No
A022/043:9:26	9	Flint	Flake	No	Patinated	21	24	6	Yes	No

Find Number	Context	Material	Type	Cortex	Condition	Length (mm)	Width (mm)	Thickn. (mm)	Complete	Retouch
A022/043:9:27	9	Flint	Debitage							
A022/043:9:28	9	Flint	Flake	Yes	Patinated	20	21	6	Yes	No
A022/043:9:29	9	Flint	Natural Chunk							
A022/043:9:30	9	Flint	Flake	Yes	Patinated	23	17	7	Yes	No
A022/043:9:31	9	Flint	Debitage							
A022/043:9:32	9	Flint	Flake	No	Slightly Patinated	26	28	8	Yes	No
A022/043:9:33	9	Flint	Flake	Yes	Patinated	19	25	8	No	No
A022/043:9:34	9	Flint	Debitage							
A022/043:9:35	9	Flint	Flake	Yes	Patinated	45	27	9	No	No
A022/043:9:36	9	Flint	Debitage							
A022/043:9:37	9	Flint	Flake	Yes	Patinated	35	21	7	Yes	No
A022/043:9:38	9	Flint	Flake	No	Patinated	25	23	6	Yes	No
A022/043:9:39	9	Flint	Debitage							
A022/043:9:40	9	Flint	Debitage							
A022/043:9:41	9	Flint	Debitage							
A022/043:9:42	9	Flint	Flake	Yes	Patinated	24	21	8	Yes	No
A022/043:9:43	9	Flint	Core	Yes	Slightly Rolled	46	39	31	Yes	No
A022/043:9:44	9	Flint	Core	Yes	Patinated	33	26	25	Yes	No
A022/043:9:45	9	Flint	Flake	Yes	Patinated	37	23	9	No	No
A022/043:9:46	9	Flint	Retouched Flake	Yes	Patinated	37	36	8	Yes	bifacial left edge
A022/043:9:47	9	Flint	Natural Chunk							
A022/043:9:48	9	Flint	Flake	Yes	Patinated	22	27	7	No	No
A022/043:9:49	9	Flint	Retouched Flake	Yes	Patinated	47	21	11	Yes	proximal right edge direct abrupt
A022/043:9:50	9	Flint	Retouched Flake	No	Patinated	37	33	9	Yes	distal inverse and right edge direct semiabrupt
A022/043:9:51	9	Flint	Flake	Yes	Patinated	24	28	9	No	No
A022/043:9:52	9	Flint	Flake	Yes	Burnt	35	29	7	Yes	No
A022/043:9:53	9	Flint	Retouched Flake	No	Patinated	44	25	4	Yes	proximal left edge direct semiabrupt
A022/043:9:54	9	Flint	Distally Trimmed Blade	Yes	Slightly Rolled	59	30	10	No	distal right edge abrupt
A022/043:9:55	9	Flint	Flake	Yes	Patinated	24	25	10	Yes	No
A022/043:9:57	9	Flint	Scraper	Yes	Slightly Patinated	34	34	7	Yes	distal, left and right edge semiabrupt
A022/043:9:58	9	Flint	Core	Yes	Patinated	52	43	17	Yes	No
A022/043:9:59	9	Flint	Retouched Flake	Yes	Patinated	30	27	10	Yes	left edge inverse low angle
A022/043:9:60	9	Flint	Flake	Yes	Patinated	64	33	11	Yes	No
A022/043:9:61	9	Flint	Natural Chunk							
A022/043:9:62	9	Flint	Flake	Yes	Slightly Patinated	41	29	9	Yes	No
A022/043:37:56	37	Flint	Flake	Yes	Patinated	23	33	7	Yes	No

Table 1 Composition of the lithic assemblage from Ballyclogh North (A022/043)

METHODOLOGY

All lithic artefacts were examined visually and catalogued using Microsoft Excel. The following details were recorded for each artefact which measured at least 2 cm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 2 cm were classed asdebitage and not analysed further. The same was done with natural chunks.

QUANTIFICATION

The lithics are all flints, five of which are natural chunks. Sixty artefacts are struck and larger than 2 cm in length and width and were therefore recorded in detail.

PROVENANCE

The lithics were recovered from the topsoil, two related burnt spreads and a pit (Table 2).

Find Number	Context	Description	Type
A022/043:1:1	1	Topsoil.	Flake

A022/043:1:2	1	Topsoil.	Core
A022/043:1:3	1	Topsoil.	Retouched Flake
A022/043:1:4	1	Topsoil.	Flake
A022/043:1:5	1	Topsoil.	Flake
A022/043:1:6	1	Topsoil.	Arrowhead
A022/043:1:7	1	Topsoil.	Debitage
A022/043:1:9	1	Topsoil.	Flake
A022/043:3:1	3	Topsoil.	Flake
A022/043:3:2	3	Topsoil.	Flake
A022/043:3:3	3	Topsoil.	Debitage
A022/043:3:4	3	Topsoil.	Retouched Flake
A022/043:9:1	9	Burnt mound-main spread	Retouched Flake
A022/043:9:2	9	Burnt mound-main spread	Flake
A022/043:9:3	9	Burnt mound-main spread	Flake
A022/043:9:4	9	Burnt mound-main spread	Flake
A022/043:9:5	9	Burnt mound-main spread	Flake
A022/043:9:6	9	Burnt mound-main spread	Core
A022/043:9:7	9	Burnt mound-main spread	Flake
A022/043:9:8	9	Burnt mound-main spread	Flake
A022/043:9:9	9	Burnt mound-main spread	Scraper
A022/043:9:10	9	Burnt mound-main spread	Flake
A022/043:9:11	9	Burnt mound-main spread	Natural Chunk
A022/043:9:12	9	Burnt mound-main spread	Core
A022/043:9:13	9	Burnt mound-main spread	Flake
A022/043:9:14a	9	Burnt mound-main spread	Flake
A022/043:9:14b	9	Burnt mound-main spread	Debitage
A022/043:9:15	9	Burnt mound-main spread	Natural Chunk
A022/043:9:16	9	Burnt mound-main spread	Flake
A022/043:9:17	9	Burnt mound-main spread	Flake
A022/043:9:18	9	Burnt mound-main spread	Flake
A022/043:9:19	9	Burnt mound-main spread	Polished Flake
A022/043:9:20	9	Burnt mound-main spread	Flake
A022/043:9:21	9	Burnt mound-main spread	Scraper
A022/043:9:22	9	Burnt mound-main spread	Flake
A022/043:9:23	9	Burnt mound-main spread	Flake
A022/043:9:24	9	Burnt mound-main spread	Flake
A022/043:9:25	9	Burnt mound-main spread	Flake
A022/043:9:26	9	Burnt mound-main spread	Flake
A022/043:9:27	9	Burnt mound-main spread	Debitage
A022/043:9:28	9	Burnt mound-main spread	Flake
A022/043:9:29	9	Burnt mound-main spread	Natural Chunk
A022/043:9:30	9	Burnt mound-main spread	Flake
A022/043:9:31	9	Burnt mound-main spread	Debitage
A022/043:9:32	9	Burnt mound-main spread	Flake
A022/043:9:33	9	Burnt mound-main spread	Flake
A022/043:9:34	9	Burnt mound-main spread	Debitage

A022/043:9:35	9	Burnt mound-main spread	Flake
A022/043:9:36	9	Burnt mound-main spread	Debitage
A022/043:9:37	9	Burnt mound-main spread	Flake
A022/043:9:38	9	Burnt mound-main spread	Flake
A022/043:9:39	9	Burnt mound-main spread	Debitage
A022/043:9:40	9	Burnt mound-main spread	Debitage
A022/043:9:41	9	Burnt mound-main spread	Debitage
A022/043:9:42	9	Burnt mound-main spread	Flake
A022/043:9:43	9	Burnt mound-main spread	Core
A022/043:9:44	9	Burnt mound-main spread	Core
A022/043:9:45	9	Burnt mound-main spread	Flake
A022/043:9:46	9	Burnt mound-main spread	Retouched Flake
A022/043:9:47	9	Burnt mound-main spread	Natural Chunk
A022/043:9:48	9	Burnt mound-main spread	Flake
A022/043:9:49	9	Burnt mound-main spread	Retouched Flake
A022/043:9:50	9	Burnt mound-main spread	Retouched Flake
A022/043:9:51	9	Burnt mound-main spread	Flake
A022/043:9:52	9	Burnt mound-main spread	Flake
A022/043:9:53	9	Burnt mound-main spread	Retouched Flake
A022/043:9:54	9	Burnt mound-main spread	Distally Trimmed Blade
A022/043:9:55	9	Burnt mound-main spread	Flake
A022/043:9:57	9	Burnt mound-main spread	Scraper
A022/043:9:58	9	Burnt mound-main spread	Core
A022/043:9:59	9	Burnt mound-main spread	Retouched Flake
A022/043:9:60	9	Burnt mound-main spread	Flake
A022/043:9:61	9	Burnt mound-main spread	Natural Chunk
A022/043:9:62	9	Burnt mound-main spread	Flake
A022/043:37:56	37	Fill of pit [C55]	Flake

Table 2 Context Information for the Assemblage from Ballyclogh North (A022/043)

CONDITION:

The lithics survive in variable condition (Table 3). Sixty artefacts are struck and larger than 2 cm in length and width. Sixteen of these are incomplete.

CONDITION	AMOUNT
Slightly Patinated	8
Patinated	49
Slightly rolled	2
Burnt	1
Total	60

Table 3 Assemblage Condition from Ballyclogh North (A022/043)

TECHNOLOGY/MORPHOLOGY:

The assemblage comprises various types of flaking products and natural chunks (Table 4).

TYPE	AMOUNT
Core	6
Flake	40
Debitage	10
Retouched Artefact	14
Natural Chunk	5
Total	75

Table 4 Assemblage Composition from Ballyclogh North (A022/043)

The six cores can be classified as two scalar cores (A022/043:9:6 and A022/043:9:58), one bipolar core (A022/043:9:12) and three single platform cores (A022/043:1:2, A022/043:9:43 and A022/043:9:44). All are made on split beach pebble flint. Cores A022/043:9:12 and A022/043:9:58 were produced on flakes.

The recovered flakes and debitage correspond to this type of technology and represent its waste products. About 90 percent of the flakes show some degree of cortex on their dorsal surfaces and were discarded as unwanted flake products. These flakes rarely exceed 40mm in length (Figure 1).

One flake (A022/043:9:48) shows use wear on its right edge which suggests that flakes were also used as tools without further modification.

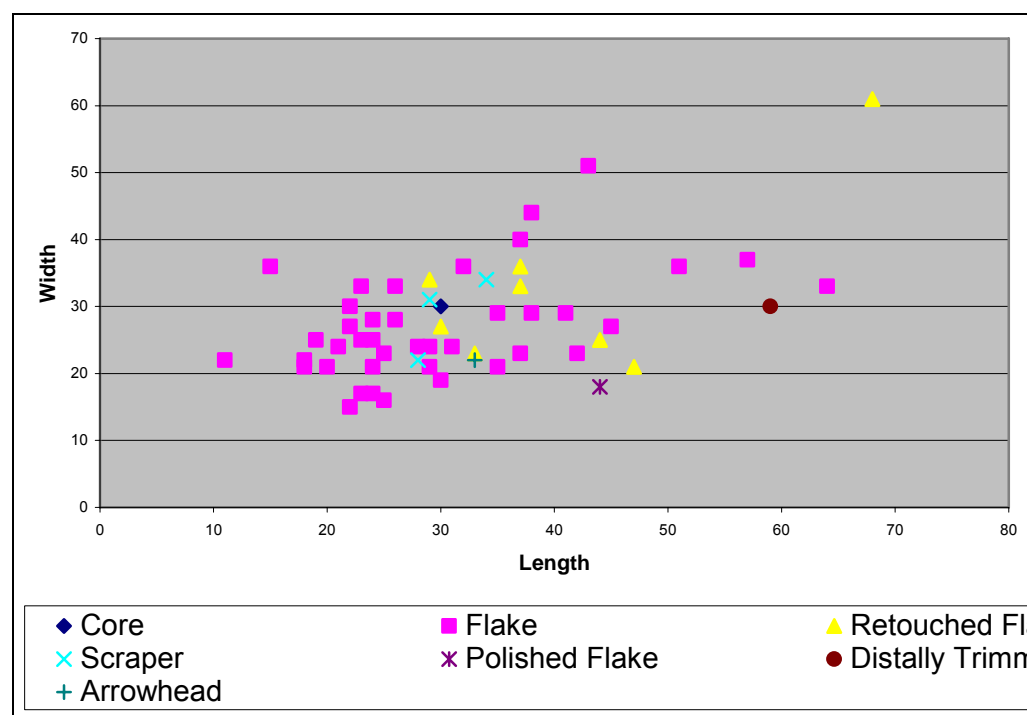


Figure 1 Dimension (mm) of the Assemblage Components from Ballyclogh North (A022/043)

Flake (A022/043:9:19) is unusual in that it displays two highly polished surfaces. This flake was produced from a polished flint axe - Subtype A (Woodman 1992) which presumably broke and attempt was made to rework it (see further below). There is no evidence that actual axe production took place at the site. It can therefore be assumed that the axe was brought to the site as a broken piece or sustained damage at the site and was then reworked and subsequently removed.

RETOUCHED ARTEFACTS:

The fourteen retouched artefacts recovered at Ballyclogh North can be separated into three groups: one distally trimmed blade, one arrowhead, three scrapers and eight miscellaneous retouched artefacts.

The distally trimmed blade (A022/043:9:54) is slightly rolled and shows retouch on its right edge, while it sustained damage on its distal end and is missing its left edge.

The arrowhead (A022/043:1:6) is patinated and of the lozenge type. It is missing its tip.

The three scrapers are a hollow scraper (A022/043:9:21) and two convex end scrapers (A022/043:9:9 and A022/043:9:57).

Of interest among the eight miscellaneous retouched artefacts (A022/043:1:3, A022/043:3:4, A022/043:9:1, A022/043:9:46, A022/043:9:49, A022/043:9:50, A022/043:9:53 and A022/043:9:59), are a possible hollow scraper with use wear in a natural hollow (A022/043:9:1) and a retouched axe production flake (A022/043:9:53) with use wear on its right and left edges. This flake derives from the same polished flint axe as the polished flake (A022/043:9:19) and represents part of the reworking of the same axe.

DATING:

The most obvious diagnostic artefacts at Ballyclogh North are the lozenge shaped arrowhead, the hollow scrapers and the two axe flakes, all of which suggest a Neolithic date for this assemblage. Hollow scrapers are often recovered from court tombs (Herity 1987) and are predominantly a late Neolithic phenomenon (Woodman *et al.* 2006), while lozenge shaped arrowhead appear to disappear in the late Neolithic. Thus, this assemblage most likely dates to the later phases of the middle Neolithic or earlier phases of the late Neolithic.

The use of a predominantly scalar technology is particularly common in the final stages of the Neolithic period, particularly in the southern half of the island of Ireland (O'Hare 2005; Woodman pers. comm.) and confirms the suggested dating of the assemblage. Bipolar technology is scarce in this assemblage as expected.

The distally trimmed blade is a stray late Mesolithic find which suggests the presence of late Mesolithic activity in the area.

CONSERVATION

Lithics do not require specific conservation, but should be stored in a dry, stable environment. Preferably, each lithic should be bagged separately and contact with other lithics should be avoided, so as to prevent damage and breakage, in particular edge damage which could later be misinterpreted as retouch. Larger and heavier items are best kept in individual boxes to avoid crushing of smaller assemblage pieces.

COMPARATIVE MATERIAL

At least 120 Neolithic polished stone axes are known in Co. Wicklow (Cooney and Mandal 1998). They were predominantly found at higher altitudes, e.g. several examples were recovered at Baltinglass passage tomb (Walshe 1941). However, polished flint axes are very rare in Ireland, only 300 examples are known and only one example from Co. Wicklow at Coolbeg (Woodman 1992).

Apart from the axes, an arrowhead from Rathdown, a hollow based arrowhead from Sugar Loaf Mountain (Delaney 2000) and a collection of scrapers from Rathmeague (Delaney 2000), very little Neolithic settlement evidence has hitherto been found in east Wicklow.

However, similar assemblages were recovered recently from other Neolithic sites which were excavated as part of the same project, e.g. at Ballymoyle (A022/019) and Ballinapark (A022/035) (Sternke 2007a and b).

Late Mesolithic material was also recovered at Site A022/082 Ballyclogh North which is situated 8km southwest of Wicklow town (Sternke 2007c).

DISCUSSION

Flint is available in larger and smaller nodules on the south Wicklow coast (Delaney 2000). The use of a scalar technology is a direct result of this availability. The majority of these flint nodules are rather small pebbles with an average dimension of 7cm and often only permit the use of a scalar or bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant scalar and split pebble bipolar, rather idiosyncratic character of the southeastern lithic assemblages (O'Hare 2005, 123).

The lithic finds from the archaeological investigations at Ballyclogh North along the route of the N11 Rathnew To Arklow Road Improvement are predominantly waste flakes from a lithic production involving a scalar technology which is typical for the southeast region. The assemblage can be dated to the Neolithic period based on technological and typological grounds. This assemblage might be linked to other Neolithic activity in the area and most likely was associated with domestic activities at this site.

The Neolithic site at Ballyclogh North (A022/043) makes an important contribution to the hitherto scarce evidence for Neolithic settlement along the east Wicklow coast.

Recommendations for Illustration

- Arrowhead (A022/043:1:6)
- Hollow scraper (A022/043:9:1)
- Convex end scraper (A022/043:9:9)
- Axe production or reworking flake (A022/043:9:53)
- Distally trimmed Blade (A022/043:9:54)
- Convex end scraper (A022/043:9:57)

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APPENDIX 3: LIST OF N11 RATHNEW TO ARKLOW ROAD IMPROVEMENT SITE NAMES

Ministerial Direction No.	Townland	NMS Registration Number	Director
A022/016	Ballinaskea	E3201	Yvonne Whitty
A022/017	Ballinaskea	E3202	Yvonne Whitty
A022/018	Ballinaskea	E3203	Yvonne Whitty
A022/019	Ballymoyle	E3204	Yvonne Whitty
A022/020	Ballymoyle	E3205	Yvonne Whitty
A022/021	Scratenagh	E3206	Goorik Dehaene
A022/022	Scratenagh	E3207	Goorik Dehaene
A022/023	Scratenagh	E3208	Goorik Dehaene
A022/024	Scratenagh	E3209	Goorik Dehaene
A022/025	Scratenagh	E3210	Goorik Dehaene
A022/026	Scratenagh	E3211	Goorik Dehaene
A022/027	Ballyrogan Lower	E3212	Goorik Dehaene
A022/028	Ballyrogan Lower	E3213	Goorik Dehaene
A022/029	Ballyrogan Lower	E3214	Goorik Dehaene
A022/030	Ballyrogan Lower	E3215	Yvonne Whitty
A022/031	Cranagh	E3216	Yvonne Whitty
A022/032	Cranagh	E3217	Ellen O' Carroll
A022/033	Cranagh	E3218	Ellen O' Carroll
A022/034	Cranagh	E3219	Ellen O' Carroll
A022/035	Ballynapark	E3220	Goorik Dehaene
A022/036	Cloghoge	E3221	Ellen O' Carroll
A022/037	Ballynapark	E3222	Ellen O' Carroll
A022/038	Ballynapark	E3223	Goorik Dehaene
A022/039	Cloghoge	E3224	Ellen O' Carroll
A022/040	Ballyclogh South	E3226	Yvonne Whitty
A022/041	Ballyclogh North	E3227	Yvonne Whitty
A022/042	Ballyclogh North	E3228	Yvonne Whitty
A022/043	Ballyclogh North	E3229	Yvonne Whitty
A022/044	Ballyclogh North	E3230	Yvonne Whitty
A022/045	Ballyclogh North	E3231	Yvonne Whitty
A022/046	Ballyclogh North	E3232	Yvonne Whitty
A022/047	Kilmurry South	E3233	Yvonne Whitty
A022/048	Kilmurry South	E3234	Yvonne Whitty
A022/049	Kilmurry South	E3235	Red Tobin
A022/050	Kilmurry North	E3236	Red Tobin
A022/051	Ballyvaltron	E3237	Goorik Dehaene
A022/052	Ballyvaltron	E3238	Goorik Dehaene
A022/053	Ballyvaltron	E3239	Goorik Dehaene
A022/054	Ballinacor East	E3240	Red Tobin
A022/055	Ballinacor East	E3241	Red Tobin
A022/056	Ballinacor East	E3242	Red Tobin
A022/057	Ballard Lower	E3243	Red Tobin
A022/058	Breagura	E3244	Ellen O' Carroll
A022/059	Breagura	E3245	Goorik Dehaene
A022/060	Ballinameesda Upper	E3246	Yvonne Whitty
A022/061	Coolacork	E3247	Yvonne Whitty
A022/062	Coolacork	E3248	Yvonne Whitty
A022/063	Roscath	E3249	Yvonne Whitty
A022/064	Coolbeg	E3250	Goorik Dehaene
A022/065	Coolbeg	E3251	Goorik Dehaene
A022/066	Coolbeg	E3252	Goorik Dehaene

Ministerial Direction No.	Townland	NMS Registration Number	Director
A022/067	Coolbeg	E3253	Goorik Dehaene
A022/068	Coolbeg	E3254	Goorik Dehaene
A022/069	Coolbeg	E3255	Goorik Dehaene
A022/070	Coolbeg	E3256	Goorik Dehaene
A022/071	Coolbeg	E3257	Goorik Dehaene
A022/072	Coolbeg	E3258	Ellen O' Carroll
A022/073	Coolbeg	E3259	Red Tobin
A022/074	Ballinaclogh	E3260	Goorik Dehaene
A022/075	Ballinaclogh	E3261	Goorik Dehaene
A022/076	Ballinaclogh	E3262	Goorik Dehaene
A022/077	Ballinaclogh	E3263	Ellen O' Carroll
A022/081	Cloghoge	E3225	Ellen O' Carroll