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N11 RATHNEW TO ARKLOW ROAD IMPROVEMENT



**NMSR No.: E3219
SITE A022/034
NGR: 327832/182841
TOWNLAND: CRANAGH
COUNTY: WICKLOW**

FINAL REPORT

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

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JUNE 2009

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ABSTRACT

This site is located in the townland of Cranagh, 10km 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 discovered during archaeological testing carried out by IAC Ltd. under the same contract during July 2005. The testing revealed an irregular-shaped spread that measured c.6.25m x 2.5m and was 0.15m deep. It consisted of black charcoal-rich clay, which was cut by a modern north-south orientated plough furrow. To the east of the spread was a small area of *in situ* burning measuring 0.75m x 0.5m. The landowner suggested at the time that this area may have been used for charcoal production as his grandfather produced charcoal in this area for export to England.

Subsequent excavation revealed a possible pit burial and two associated pits. The spread and *in situ* burning were related to modern field clearance burning. The excavation area measured 375m². The pit burial and two associated pits were dated to the early Bronze Age. Two sigma radiocarbon dates of 2140–1910 BC and 2290–1960 BC were retrieved from oak charcoal (*Quercus* sp) recovered from the fills of the two pits (WK20667, Appendix 2.2). The fragments of bone recovered from the pit burial were so small that detailed analysis was not possible.

It is likely that the pits excavated at this site consisted of a simple cremation pit and two associated pits dating to the late Neolithic/early Bronze Age. Oak was identified in the samples and oak is also the dominant species found in cremation pits. It is probable that oak was consciously selected for use as pyre fuel at this cremation site although no evidence of the pyre or related activity was identified. A similar pit burial site, Site A022/033, was located to east. However, it returned a radiocarbon date that was c. 300 years later than the dates returned from this site.

Cremation was the dominant rite in the treatment of human remains during the Bronze Age in Ireland. Cremation pits are a common form of burial in the Bronze Age in which the dead would have been burnt on a wooden pyre and the ashes placed in a small pit. Burials can be found in isolation, or grouped together in cemeteries. Recent excavations along the many linear infrastructure projects have revealed hundreds of these pit burials and analysis indicates that these pits may indeed not be 'isolated' features as such and may be part of the wider landscape of Bronze Age burial rites in Ireland (Grogan, O Donnell & Johnstown 2007, 115).

The cremation pit and associated pits excavated at Cranagh are most likely related to the funerary rites of the Bronze Age peoples who were interacting with the surrounding landscape as evidenced from the many burnt mounds excavated in the surrounding area.

ACKNOWLEDGMENTS

The archaeological excavation at Cranagh, 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 archaeological excavation carried out in the townland of Cranagh, Co. Wicklow (Figure 1) as part of an archaeological mitigation programme associated with the N11 Rathnew to Arklow Road Improvement. Archaeological fieldwork was directed by Ellen O' Carroll 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 Cranagh townland, Dunganstown parish and the barony of Arklow to the immediate west of the current N11, c. 10km northeast of Arklow (County Wicklow OS sheet 36). The site details are:

- Site Cranagh, Ministerial Direction No.: A022/034, NMS Registration No.: E3219, Route Chainage (Ch) 5750, NGR 327832/82841.

The site was identified as a result of a test trenching exercise undertaken by IAC Ltd. under the same contract in July 2005 (Ministerial Direction A022/005, Dave Bayley). The route was divided into 14 different test areas for the initial ground testing / assessment phase. Testing revealed an irregular shaped spread that measured c.6.25m x 2.5m and was 0.15m deep. It consisted of black charcoal rich clay, which was cut by a modern plough furrow orientated north-south. To the east of the spread was a small area of *in situ* burning measuring 0.75m x 0.5m. Two possible postholes also lay c. 1.75m to the east of the area of *in situ* burning. One of the possible postholes measured 0.75m in diameter, and the second measured 0.6m in diameter. The landowner suggested at the time that this area may have been used for charcoal production as his grandfather produced charcoal in this area for export to England. Subsequent excavation revealed a possible pit burial and two further pits that may be prehistoric in date. The excavation area measured 30m by 12.5m (375m²).

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 dual carriageway 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 Newtownmountkennedy 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 19/06/2006. The order and date of the excavation is as follows:

- Site excavation commenced on 19/06/2006 with a team of 1 field director, 1 supervisor, 2 assistant archaeologists and 3 general operatives. This involved cleaning back and pre-excavation planning and was followed by hand recording and resolution of the site.
- Excavation and recording of all features were completed by 25/06/2006.

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 is located in the townland of Cranagh, Dunganstown parish and the barony of Arklow 10km northeast of Arklow town, Co. Wicklow. The site was located in low-lying relatively flat countryside surrounded by gentle hills and a small stream.

2.2 Archaeological Landscape

As part of the general research along the scheme and the particular research focussed on this site (Site A022/034), 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 (Site A022/034) revealed a pit burial and two associated pits. This has been dated to the early Bronze Age.

2.2.1 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* 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, unearthed 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, 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,).

Five 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, 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

The immediate landscape in Cranagh and adjacent townland Ballynapark contained five burnt mound sites. Of these, lithic analysis at 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 also returned an early Bronze Age date, while Site A022/038 returned an early to middle Bronze Age date. No radiocarbon date was returned from Site A022/039, but it is interpreted as being Bronze Age in date. A possible pit burial dated to the early Bronze Age was excavated nearby at Site A032/033 in Cranagh.

To the immediate south, also in Cranagh, one site was excavated. Site A022/031 comprised four pits, three of which were dated to the early Neolithic as a total of 31 sherds of Neolithic Carinated Bowl were recovered from the fill of two of the pits. A radiocarbon date from oak charcoal recovered from the fill of a pit that contained 29

sherds returned a Mesolithic result, but this discrepancy can most likely be explained by the phenomenon known as the 'old oak effect', which means that radiocarbon dates using oak charcoal can be unreliable. An isolated pit in the west of the site returned an early medieval/medieval radiocarbon date. This pit probably functioned as a charcoal production pit.

Further south, in Ballyrogan Lower, two burnt spread sites were excavated. Site A022/027 returned a middle Bronze Age date, while Site A022/030 was not dated but is interpreted as being Bronze Age. Two other sites, Site A022/028 and Site A022/029, were excavated in Ballyrogan Lower, but were not of archaeological significance.

To the north, in Cloghoge, the edge of a burnt spread was excavated at Site A022/081. The majority of the burnt spread was located outside the landtake of the proposed road. No suitable material for radiocarbon dating was recovered, but lithics recovered were dated by technology and typology to the Bronze Age.

Further north, seven burnt mound sites were excavated in Ballyclogh North and South. No suitable material for dating was recovered from Site A022/042 but the remaining six sites in Ballyclogh North and South – Sites A022/040, 041, 043, 044, 045, and 046 ranged in date from 2020–1770 BC and 1320–1000 BC, indicating early to middle Bronze Age 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.

2.2.3 Typological Background of Pit Burials

Cremation was the dominant rite in the treatment of human remains during the Bronze Age in Ireland. Cremation pits are a common form of burial in the Bronze Age in which the dead would have been burnt on a wooden pyre and the ashes placed in a small pit. Burials can be found in isolation, or grouped together in cemeteries. Recent excavations along the many linear infrastructure projects have revealed hundreds of these pit burials and analysis indicates that these pits may indeed not be 'isolated' features as such and may be part of the wider landscape of Bronze Age burial rites in Ireland (Grogan, O'Donnell & Johnstown 2007, 115). In the middle and later Bronze Age the quantity of cremated bone deposited represented a token deposit rather than the full cremated body.

3 METHODOLOGY

3.1 Introduction

The excavation at Site A022/034, Cranagh was undertaken as part of archaeological mitigation for the N11 Rathnew to Arklow Road Improvement in the townland of Cranagh.

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 5 m 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.

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 dating of the site was carried out by means of Standard Radiometric Radiocarbon Dating of identified and recommended charcoal samples. All calibrated radiocarbon dates are quoted to two sigma.

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 {3400} consists of Cut [x] and fills (y) and (z)
- Subgroup {3456} 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 1: Natural Geology

4.1.1 Subgroup: {1001} Natural Geology

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation	Area
2	Subsoil						Yellow / brown, sandy silt	Subsoil	

Finds: None

Interpretation:

The natural subsoil was uniform across the site. The composition was consistent and the topography was level.

GROUP 1 Discussion: Natural Geology

Group	Subgroup	Subgroup type	Period by finds/stratigraphy	Period by interpretation	Group interpretation
1	1001	Subsoil	N/A		Natural geology

The natural subsoil of the site comprised of yellow brown sandy silt.

4.2 GROUP 2: Early Bronze Age Activity

4.2.1 Subgroup: {1002} Possible Pit Burial

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation	Area
4	Fill	C20		0.03	0.45	0.45	Loose, black, silt with frequent inclusions of charcoal and burnt bone	Pit fill	
20	Cut		C4, C22	0.16	0.45	0.45	A circular cut with a sharp break of slope at the top and base. The cut had vertical sides and a flat base	Cut of pit	
22	Fill	C20		0.13	0.45	0.45	Loose, brown, clay with occasional small stone inclusions and a small quantity of burnt bone	Pit fill	

Finds: None

Interpretation:

This subgroup represents a possible circular pit burial [C20] filled with two layers of charcoal-rich silts and clays, (C4) and (C22) (Figures 4 and 5; Plate 1). A small amount of burnt bone was also found in the fills. The bone fragments were so small that detailed analysis was not possible. This pit was probably associated with Bronze Age funerary activity.

4.2.2 Subgroup {1003}: Pit

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation	Area
13	Fill	C23		0.63	0.08	0.76	Loose, brown / black, sandy clay with occasional small stone inclusions and frequent flecks of	Pit fill	

							charcoal		
23	Cut		C13, C24	0.23	0.74	0.74	A circular cut with a moderately sharp break of slope at the top. The sides were concave and the break of slope at the base was uneven	Cut of pit	
24	Fill	C23		0.07	0.64	0.06	Compact, yellow / brown, sandy clay with occasional flecks of charcoal	Pit fill	

Finds: None

Interpretation:

This subgroup consists of a circular pit [C23] that was filled with two layers of sands and clays which small stones and frequent flecks of charcoal (Figures 4 and 5).

Analysis of the charcoal recovered from pit fill (C13) indicated that oak (*Quercus* spp) was the only species present (O'Carroll, Appendix 2.1). This pit did not appear to be a pit burial due to the lack of bone in the fill. However, the oak charcoal retrieved from fill (C13) may suggest that it had a function relating to the pit burial [C20] as oak is generally the main taxa identified from cremated remains (*ibid*).

A sample of this charcoal was chosen for radiocarbon dating and returned a date of 2140–1910 BC (WK20667, Appendix 2.2), which dates the pit to the early Bronze Age.

4.2.3 Subgroup {1004}: Pit

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation	Area
14	Fill	C25		0.13	0.09	0.74	Loose, brown / black, sandy clay with occasional small stone inclusions and frequent flecks of charcoal	Pit fill	
21	Fill	C25		0.1	0.16	0.26	Loose, yellow / grey, sandy clay with occasional flecks of charcoal	Pit fill	
25	Cut		C14, C21	0.27	0.64	0.74	A circular cut with a moderately sharp break of slope at the top. The sides were concave and the break of slope at the base was uneven	Cut of pit	

Finds: None

Interpretation:

This subgroup consists of a circular pit [C25] filled with two layers of sands and clays, (C14) and (C21), which contained occasional small stone inclusions and charcoal flecking.

Analysis of the charcoal recovered from fill (C14) showed that oak (*Quercus* spp) was the only species present (O'Carroll, Appendix 2.1). This pit did not appear to be a pit burial due to the lack of bone in the fill. However, the oak charcoal retrieved from fill (C14) may suggest that it had a function relating to the pit burial [C20] as oak is generally the main taxa identified from cremated remains (*ibid*).

A sample of this charcoal was chosen for radiocarbon dating and returned a date of 2290–1960 BC (WK20668, Appendix 2.2), which places pit [C25] in the early Bronze Age.

GROUP 2 Discussion: Early Bronze Age Activity

Group	Subgroup	Subgroup type	Period by finds/stratigraphy	Period by interpretation	Group interpretation
2	{1002}	Possible pit burial	N/A	Bronze Age	Bronze Age
2	{1003}	Pit	N/A	Bronze Age	Bronze Age
2	{1004}	Pit	N/A	Bronze Age	Bronze Age

Group 2 consists of a single, possible pit burial and two further pits. The possible pit burial was filled with charcoal-rich silts and clays and a small amount of burnt bone. This pit may have been associated with Bronze Age funerary activity. The other two pits were probably associated with the pit burial and are likely to be connected with the funerary rites of the Bronze Age peoples. The two pits were both similar in shape and were filled with two layers of clays and sands with occasional small stone inclusions and a small quantity of charcoal. This charcoal was shown to contain only oak (*Quercus* spp). This strengthens the probability of a link with the pit burial as oak is generally the main taxa identified from cremated remains.

Radiocarbon dates from the fills, (C13) and (C14), of the two pits, [C23] and [C25], dated them to the early Bronze Age, with two sigma radiocarbon dates of 2140–1910 BC and 2290–1960 BC respectively (WK20667, Appendix 2.2).

4.3 GROUP 3: Topsoil

4.3.1 Subgroup {1005} Topsoil

Contexts:

C	Type	Fill of	Filled by	Depth (m)	Length (m)	Width (m)	Description	Interpretation	Area
1	-	-	-	-	-	-	Topsoil		

Finds: None

Interpretation:

This subgroup represents the topsoil (C1) which sealed all archaeological features on the site. It comprised mid-brown clayey silt with occasional small stone inclusions and was consistent across the site.

GROUP 3 Discussion: Topsoil

Group	Subgroup	Subgroup type	Period by finds/stratigraphy	Period by interpretation	Group interpretation
3	{1005}	Topsoil	Modern	Modern	Modern

Topsoil sealed the entire site.

5 SYNTHESIS AND DISCUSSION

5.1 Physical Setting

The geology of the region surrounding Cranagh is within a plain based on Palaeozoic rocks. The soils of the region developed on glacial materials deposited by successive glaciations. The subsoil within the site comprised of yellow brown, silty clay. The excavated site was located in modern agricultural, well-drained land. This consisted of low-lying, relatively flat countryside surrounded by gentle hills and a small stream.

5.2 Summary of the Site Specific Archaeological Landscape

Another possible pit burial site, Site A022/033, was recorded in Cranagh. This burial was dated to the early Bronze Age. The immediate landscape in Cranagh and adjacent townland Ballynapark contained five burnt mound sites. Lithic analysis at Site A022/035 dated one phase of activity to the middle Neolithic. Radiocarbon dating indicated an early Bronze Age date for the remainder of the activity on site. Site A022/032 and A022/038 returned early and middle Bronze Age dates. No radiocarbon date was returned from Site A022/039, but it is interpreted as being Bronze Age in date.

To the immediate south, also in Cranagh, one site (Site A022/031) was excavated and comprised four pits. Three of these pits were dated to the early Neolithic by 31 sherds of Neolithic Carinated Bowl recovered from the fills. An isolated pit in the west of the site returned an early medieval/medieval radiocarbon date. This pit probably functioned as a charcoal production pit. Further south, in Ballyrogan Lower, two burnt spread sites were excavated. Site A022/027 returned a middle Bronze Age date, while Site A022/030 was not dated but is interpreted as being Bronze Age.

To the north, in Cloghoge, the edge of a burnt spread was excavated at Site A022/081. The majority of the burnt spread was located outside the landtake of the proposed road. Further north, seven burnt mound sites were excavated in Ballyclogh North and South. Six of these sites – Sites A022/040, 041, 043, 044, 045, and 046 - returned various dates ranging from 2020–1770 BC and 1320–1000 BC, indicating early to middle Bronze Age activity.

5.3 Summary of Excavation Results

The excavation at this site revealed the remains of a possible pit burial and two other associated pits. The pit burial was filled with charcoal-rich, silt clay and a small amount of burnt bone. The bone fragments were very small and detailed analysis was not possible. The other two pits contained silty clay fills with stone and charcoal inclusions. Analysis of the charcoal revealed that oak was the only species present in both pits. This indicates a relationship between the two pits and the pit burial as oak is generally the main and sometimes only taxa identified from cremated remains. A sample of the charcoal from each pit was chosen for radiocarbon dating. These produced two sigma radiocarbon dates of 2290–1960 BC and 2140–1910 BC, dating the pits to the early Bronze Age. No artefacts were recovered from the site.

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 available in Appendix 2.

5.4.1 Species Identification of Charcoal Samples

Oak (*Quercus* sp.) was the only species identified from the charcoal remains. The fact that oak was identified from the samples indicates that these pits are most likely related to the simple cremation pit. The oak was probably consciously selected for use as pyre fuel at this cremation site. The oak identified indicates that a supply of such material was available in the area. The oak would have grown in drier conditions, preferring free-draining and nutrient rich soils. However, it can also grow on wetter areas during dry periods.

5.4.2 Radiocarbon Dating

A total of 2 charcoal samples were sent for radiocarbon dating. These samples were processed in the University of Waikato, New Zealand. Sample WK20667 was from a sample of oak charcoal (*Quercus* sp) taken from the fill (C13) of the pit [C23]. It returned a date of 2140–1910 BC and was processed using the Standard Radiometric method. Sample WK20668 was from a sample of oak charcoal (*Quercus* sp) taken from the fill (C14) of the pit [C25]. It returned a date of 2290–1960 BC and was processed using the Standard Radiometric method.

5.5 Discussion

It is likely that the pits excavated at this site consisted of a simple cremation pit and two associated pits dating to the late Neolithic/early Bronze Age. Oak was identified in the samples and oak is also the dominant species found in cremation pits. It is probable that oak was consciously selected for use as pyre fuel at this cremation site although no evidence of the pyre or related activity was identified. A similar pit burial site, Site A022/033, was located to east. However, it returned a radiocarbon date that was c. 300 years later than the dates returned from this site.

Cremation was the dominant rite in the treatment of human remains during the Bronze Age in Ireland. Cremation pits are a common form of burial in the Bronze Age in which the dead would have been burnt on a wooden pyre and the ashes placed in a small pit. Burials can be found in isolation, or grouped together in cemeteries. Recent excavations along the many linear infrastructure projects have revealed hundreds of these pit burials and analysis indicates that these pits may indeed not be 'isolated' features as such and may be part of the wider landscape of Bronze Age burial rites in Ireland (Grogan, O Donnell & Johnstown 2007, 115).

The cremation pit and associated pits excavated at Cranagh are most likely related to the funerary rites of the Bronze Age peoples who were interacting with the surrounding landscape as evidenced from the many burnt mounds excavated in the surrounding area.

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APPENDIX 1: CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Type	Fill of	Filled by	Definition	Group	Subgroup	Subgroup Summary	Depth (m)	Length (m)	Width (m)
1	-	-	-	Topsoil	3	{1005}	Topsoil	-	-	-
2	-	-	-	Subsoil	1	{1001}	Natural Geology	-	-	-
3	Void	-	-							
4	Fill	C20	-	Pit burial fill	2	{1002}	Possible Pit Burial	0.03	0.45	0.45
5-12	Void	-	-							
13	Fill	C23	-	Pit burial fill	2	{1003}	Pit	0.63	0.08	0.76
14	Fill	C25	-	Pit fill	2	{1004}	Pit	0.13	0.09	0.74
15-19	Void	-	-							
20	Cut	-	C4, C22	Cut of pit	2	{1002}	Possible Pit Burial	0.16	0.45	0.45
21	Fill	C25	-	Pit fill	2	{1004}	Pit	0.1	0.16	0.26
22	Fill	C20	-	Pit burial fill	2	{1002}	Possible Pit Burial	0.13	0.45	0.45
23	Cut	-	C13, C24	Cut of pit	2	{1003}	Pit	0.23	0.74	0.74
24	Fill	C23	-	Pit fill	2	{1003}	Pit	0.07	0.64	0.06
25	Cut	-	C14, C21	Pit cut	2	{1004}	Pit	0.27	0.64	0.74

Appendix 1.2 Artefact Catalogue

No artefacts were discovered at Site A022/034.

Appendix 1.3 Archive Index

Project: N11 Rathnew to Arklow Road Improvement	Irish Archaeological Consultancy Ltd	
Site Name: Cranagh		
Ministerial Number: A022/034		
Site director: Ellen O'Carroll		
Date: May 2009		
Field Records	Items (quantity)	Comments
Site drawings (plans)	5	
Site sections, profiles, elevations	3	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	6	
Survey/levels data (origin information)	On plans	Digital copy also
Context sheets	11	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	14	
Photographs (print)	0	
Photographs (slide)	0	
Finds and Environmental Archive		
Flint/chert	0	
Stone artefacts	0	
Pottery (specify periods/typology)	0	
Ceramic Building Material (specify types e.g. daub, tile)	0	
Metal artefacts (specify types - bronze, iron)	0	
Glass	0	
Other find types or special finds (specify)	0	
Human bone (specify type e.g. cremated, skeleton, disarticulated)	0	
Animal bone	0	
Metallurgical waste	0	
Enviro bulk soil (specify no. of samples)	5	
Enviro monolith (specify number of samples and number of tins per sample)	0	
Security copy of archive	Yes	Digitised

APPENDIX 2: SPECIALIST REPORTS

Appendix 2.1 Charcoal and Wood ID Report – Ellen O’ Carroll

Appendix 2.2 Radiocarbon Dating Results – Waikato University Laboratory

Appendix 2.1 Charcoal and Wood ID Report – Ellen O’ Carroll

1. Introduction

Two charcoal samples from archaeological investigations at Cranagh, Co. Wicklow were analysed in respect of suitability for dating and species selection in association with the excavated features. The excavated features consisted of a possible cremation pit and two associated pits. A series of modern spreads associated with the widening and deepening of the nearby stream, modern agricultural burning and furrows were also investigated.

Two samples from the fills (C13 and C14) of two pits (C23 and C25 respectively) were identified and the remaining identified samples were completed from the modern agricultural features. The pits have been dated to 2140–1910 BC (C13) and 2290–1960 BC (C14). The pits are most likely related to the funerary rites of the Bronze Age peoples who were interacting with the surrounding landscape as evidenced from the many burnt mounds excavated in the area, as there was a cremation pit adjacent to these two pits.

The charcoal was sent for species identification prior to ¹⁴C dating, and also to obtain an indication of the range of tree species which grew in the area, as well as the utilization of these species for various functions. Wood used for fuel at pre-historic sites would generally have been sourced at locations close to the site. Therefore charcoal identifications may, but do not necessarily, reflect the composition of the local woodlands. Larger pieces of charcoal, when identified, can provide information regarding the use of a species.

2. Methodology

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). 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 charcoal 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.

The identifications were completed by weight. The charcoal fragments from similar species were grouped together and then counted and weighed (Table 1).

3. Results

Date	Site No	Context No	Sample No	Species & Weight	Comment	Feature Type
2290-1960BC	34	14	3	All <i>Quercus</i> spp	16.2g	Fill of cremation pit
2140-1910BC	34	13	2	All <i>Quercus</i> spp	21.5g	Fill of cremation pit

Table 1 Wood species identification and analysis of samples

Botanical name	Species	Weight
<i>Quercus</i> spp	Oak	37.7g

Table 2 Species represented in the identified samples

4. Discussion

Oak was the only taxa identified from the charcoal remains. The oak is representative of wood associated with the cremation pit.

Oak was exclusively identified from the two possible cremation pits dating to the early Bronze Age. The fact that oak was identified from the samples indicates that these pits are most likely related to the simple cremation pit. Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*) are both native to and common in Ireland. The wood of these species cannot be differentiated based on its microstructure. Pendunculate oak is found on heavy clays and loams particularly where the soil is of alkaline pH. Sessile oak is found on acid soils often in pure stands and although it thrives on well-drained soils it is also tolerant of flooding (Beckett 1979, 40-41). Both species of oak grow to be very large trees (30-40m) and can live to an age of about 400 years. The oak identified suggests that there was a supply of oak in the surrounding environment at the time of use of the site.

5. Comparative material

The charcoal identifications from the excavations at Site A022/034 mirror the results compiled by the author at similar excavated sites. Two cremation pits excavated nearby in the same townland also produced large quantities of oak charcoal (A022-33). Charcoal analyses at other cremation sites (Bettystown (98E072), Ballybrowney Lower 1 (03E1058) and Hermitage (01E0319) has revealed that oak is the most dominant species identified from within these features. Oak makes good firewood when dried and would have been deliberately selected for use within this cremation pyre.

6. Summary & Conclusions

Oak was selected for use in association with the cremation pits.

In early Irish law the oak was classified as one of the seven *Airig fedo* or Nobles of the wood. Its association with folk beliefs and customs abounds and one such example can be seen in its specified use for kindling the bonfires of Maytime and Midsummer in Wales and Scotland (Mac Coitir 2003, 58).

Oak was probably consciously selected for use as pyre fuel at this cremation site. Similar analyses undertaken from excavated Bronze Age cremation pits throughout Ireland by this author produced similar results, which indicated that oak was the main species prevalent at these sites.

The oak identified indicates that a supply of such material was available in the area and it was selected for deliberate functions. The oak would have grown in drier conditions preferring free-draining and nutrient rich soils, although it can grow on wetter areas during dry periods.

7. References

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Appendix 2.2 Radiocarbon Dating Results – Waikato University Laboratory

The University of Waikato Radiocarbon Dating Laboratory



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Ph +64 7 838 4278
email c14@waikato.ac.nz
Head: Dr Alan Hogg

Report on Radiocarbon Age Determination for Wk- 20667

Submitter I Johnston
Submitter's Code A022/034 13/2
Site & Location N11 Rathnew – Arklow Project, Ireland
Sample Material Oak
Physical Pretreatment Possible contaminants were removed. Washed in ultrasonic bath.
Chemical Pretreatment Sample washed in hot 10% HCl, rinsed and treated with hot 1% NaOH. The NaOH insoluble fraction was treated with hot 10% HCl, filtered, rinsed and dried.

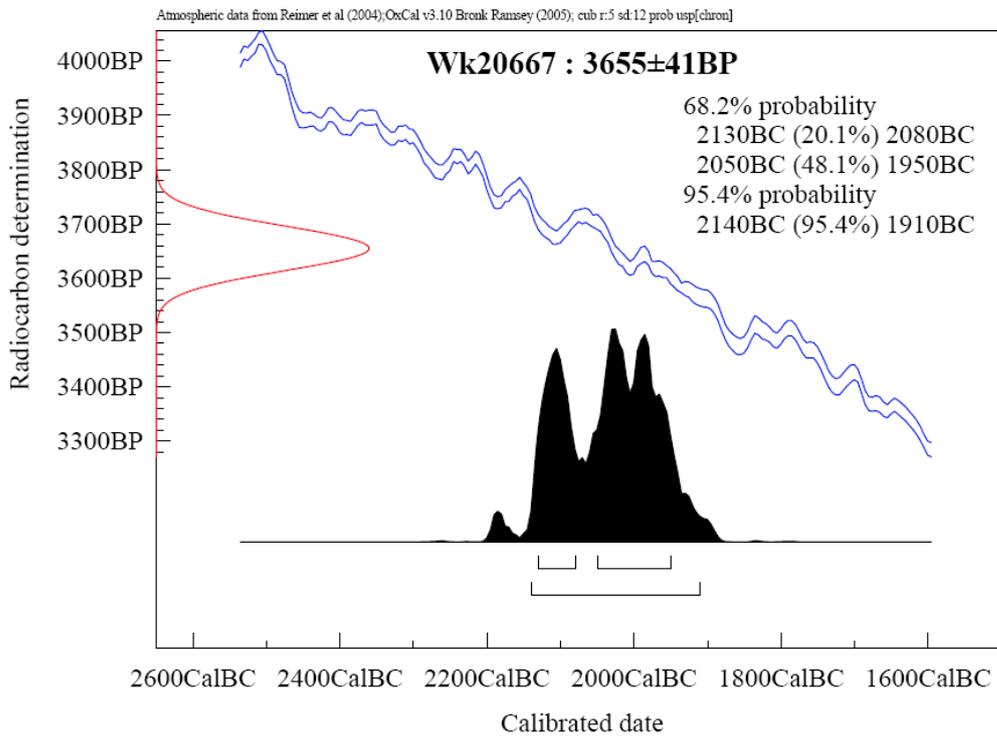
$\delta^{14}\text{C}$	-366.3 ± 3.2	‰
$\delta^{13}\text{C}$	-25.6 ± 0.2	‰
D^{14}C	-365.6 ± 3.2	‰
% Modern	63.4 ± 0.3	%
Result	3656 ± 41 BP	

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.



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Radiocarbon Dating Laboratory



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Head: Dr Alan Hogg

Report on Radiocarbon Age Determination for Wk- 20668

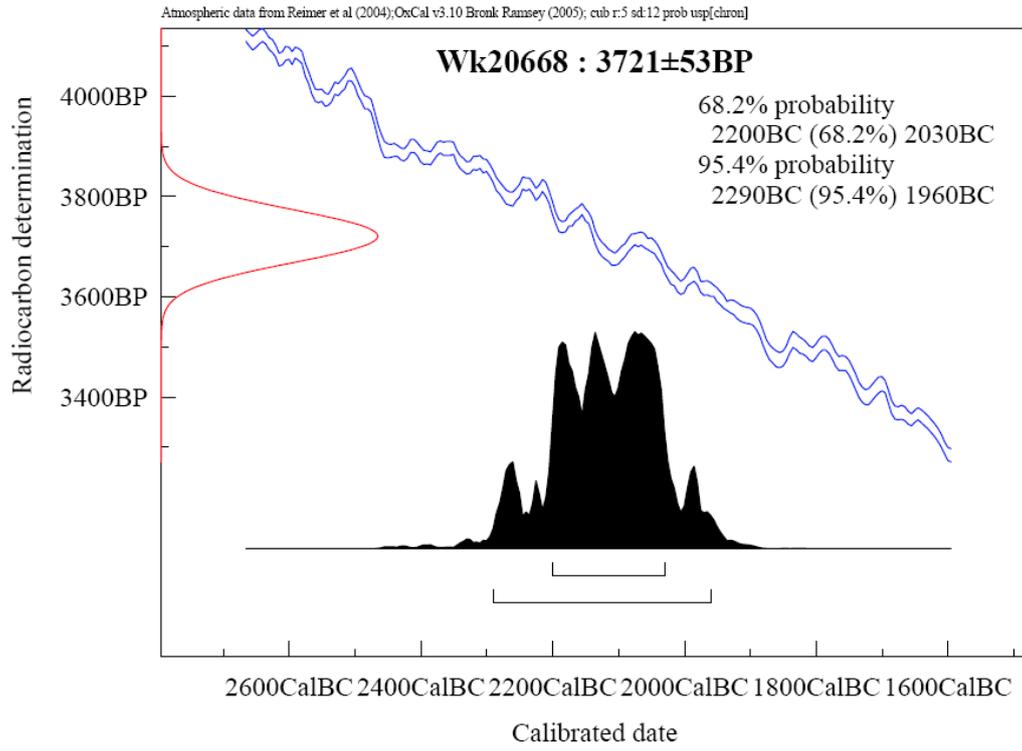
Submitter I Johnston
Submitter's Code A022/034 14/3
Site & Location N11 Rathnew – Arklow Project, Ireland
Sample Material Oak
Physical Pretreatment Possible contaminants were removed. Washed in ultrasonic bath.
Chemical Pretreatment Sample washed in hot 10% HCl, rinsed and treated with hot 1% NaOH. The NaOH insoluble fraction was treated with hot 10% HCl, filtered, rinsed and dried.

d ¹⁴ C	-371.7 ± 4.1	‰
δ ¹³ C	-25.8 ± 0.2	‰
D ¹⁴ C	-370.7 ± 4.1	‰
% Modern	62.9 ± 0.4	%
Result	3722 ± 53 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, δ¹³C, is expressed as ‰ wrt PDB.
- Results are reported as % *Modern* when the conventional age is younger than 200 yr BP.



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

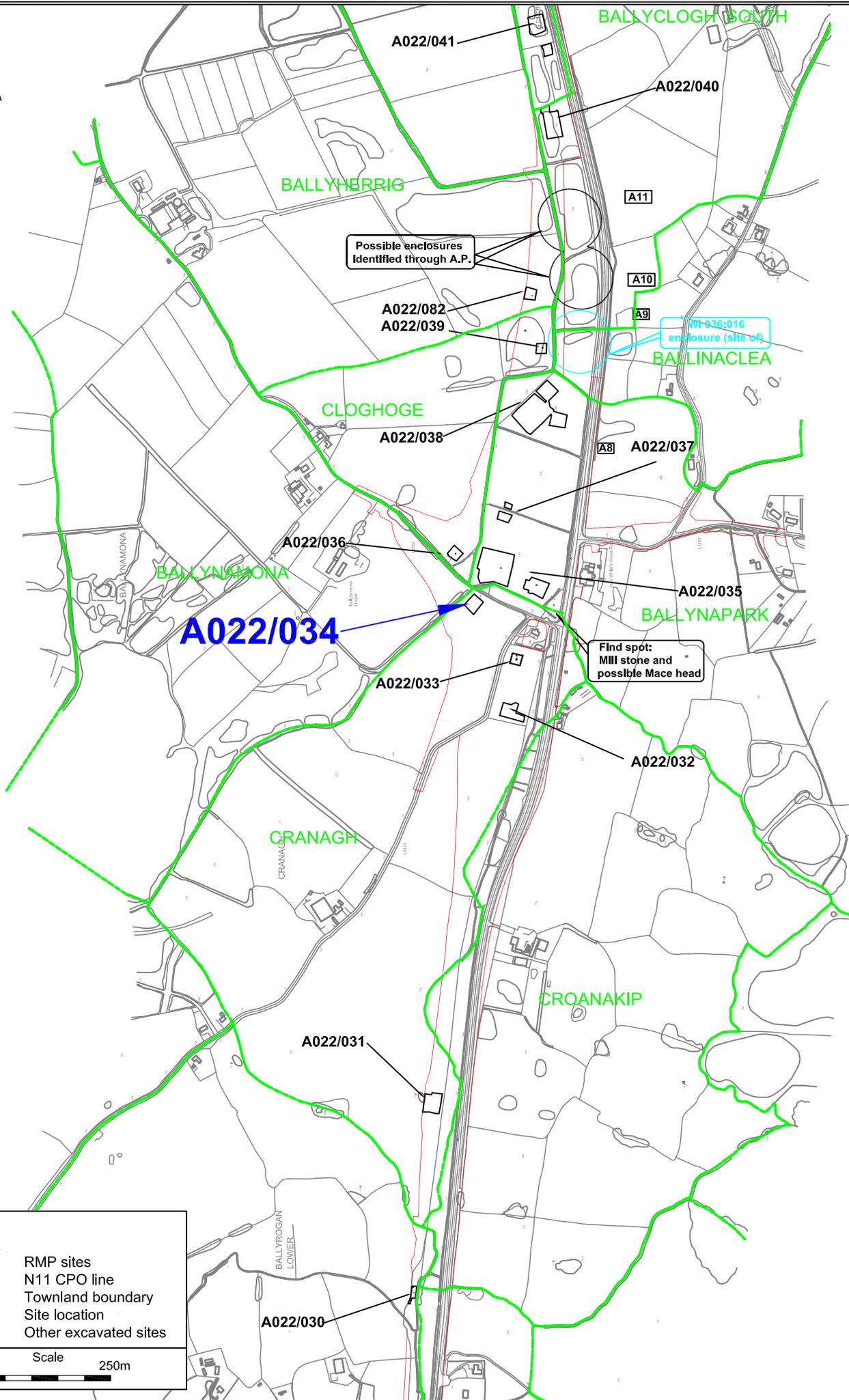


A022/034

Legend

- N11 CPO Extent
- Site Location
- Existing N11

Scale 0km 2.5km

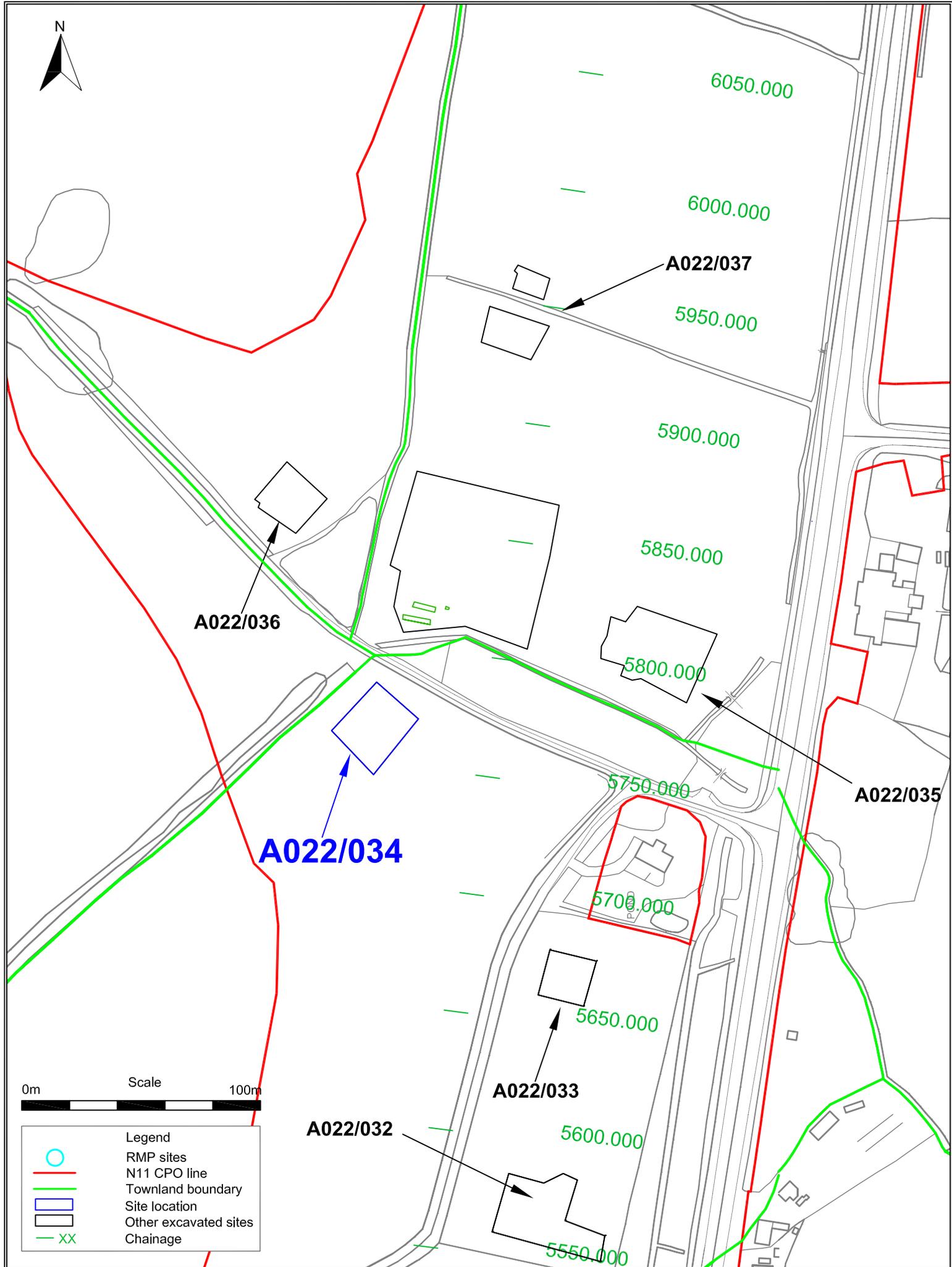


Legend

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

0m Scale 250m

Title:	Site A022/034 E3219, showing RMP and OS background	Scale:	1:10,000 @ A4
Project:	N11 Rathnew to Arklow Road Improvement	Date:	11/12/09
Client:	Wicklow County Council	Produced by:	G Kearney
		Job No:	J2883
		Figure No:	2



Legend

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

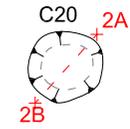
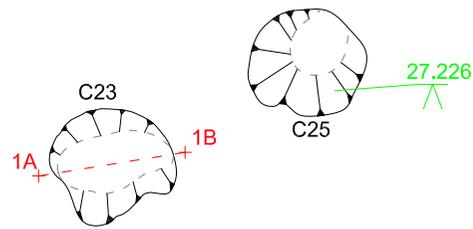
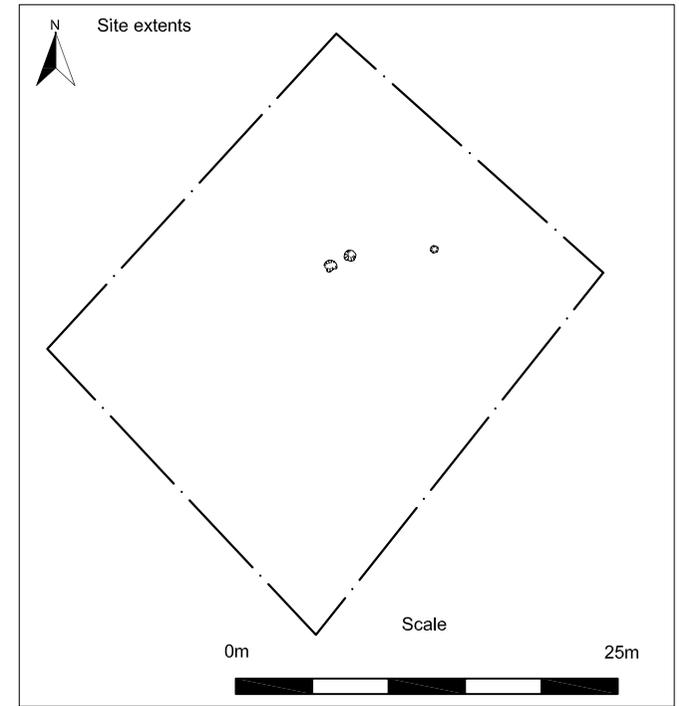


Title:	Site A022/034 E3219, showing detail of site within development
Project:	N11 Rathnew to Arklow Road Improvement
Client:	Wicklow County Council

Scale:	1:2000 @A4
Date:	17/12/09
Produced by:	P Higgins
Job No:	J2283
Figure No:	3



327829,
182848 +



327829,
182843 +

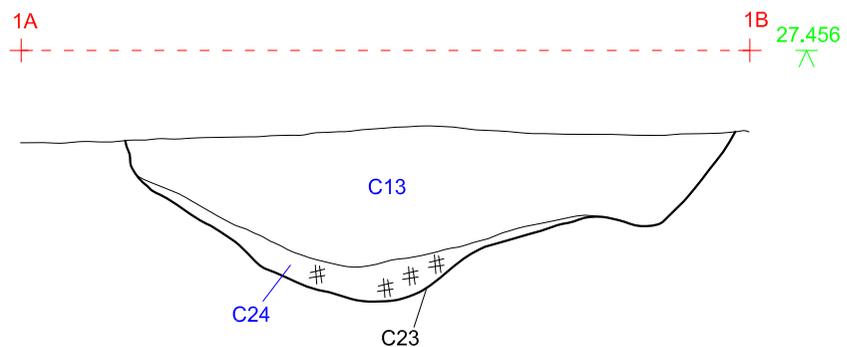
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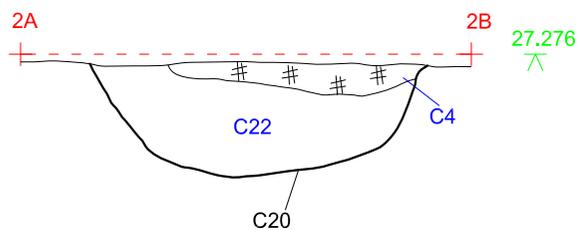
Legend	
---	Sections
Cxx	Cut numbers
■	Burnt mound deposits
xx.xx	Levels - metres OD
+ xxxxxx, xxxxxx	National Grid Reference

	Title: Site A022/034 E3219, Plan of site	Scale: 1:50 @A4
	Project: N11 Rathnew to Arklow Road Improvement	Date: 16/12/09
	Client: Wicklow County Council	Produced by: G Kearney
		Job No: J2283
		Figure No: 4

South facing section of C23



Northwest facing section of C20



Scale
0m 0.5m

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

IAC Irish Archaeological
Consultancy

Title: Site A022/034 E3219, Sections through [C23] and [C20]

Project: N11 Rathnew to Arklow Road Improvement

Client: Wicklow County Council

Scale: 1:10 @A4

Date: 16/04/09

Produced by: G Kearney

Job No: J2283

Figure No: 5

Group III: Topsoil

Group II: Archaeological features

Group I: Natural geology

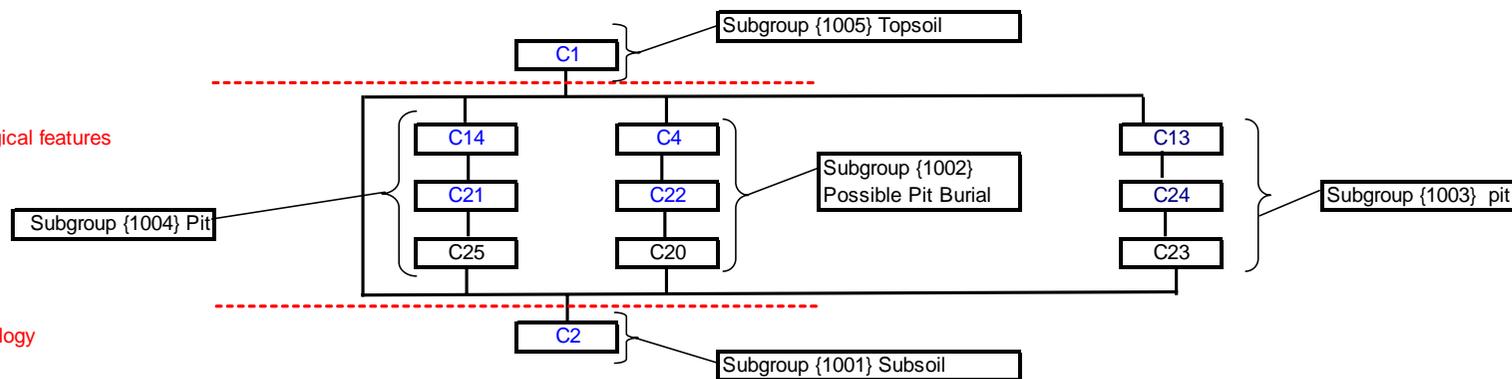




Plate 1: Post-excitation view of possible pit burial [20], facing south