N6 KINNEGAD – ATHLONE SCHEME PHASE 2: KILBEGGAN TO ATHLONE DUAL CARRIAGEWAY

SITE A016/0560; E2689: KILBEG 2

FINAL REPORT

ON BEHALF OF WESTMEATH COUNTY COUNCIL

15 JULY 2009

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project Reference No.	WH/00/112
Project	N6 Kinnegad–Athlone Road Scheme: Phase 2, Kilbeggan–Athlone Dual Carriageway
Ministerial Direction Reference No.	A016/060
NMS Registration Number	E2689
Excavation Director	Fintan Walsh
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Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Westmeath County Council
Site Name	Kilbeg 2
Site Type	Early Bronze Age Burnt Mound
Townland	Kilbeg
Parish	Ardnurcher or Horseleap
County	Westmeath
NGR (Easting)	E228870
NGR (Northing)	N236700
Chainage	24220–24240
Height m OD	66m OD
RMP No.	N/A
Excavation Start Date	22 March 2006
Excavation Duration	9 days
Report Type	Final
Report Date	15 July 2009
Report By	Fintan Walsh

ACKNOWLEDGMENTS

This report has been prepared by Irish Archaeological Consultancy Ltd on behalf of Westmeath County Council and the National Roads Authority in advance of the construction of the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme.

The excavation was carried out in accordance with the Directions of the Minister for the Environment, Heritage and Local Government (DOEHLG), in consultation with the National Museum of Ireland (NMI) issued under Section 14 of the National Monuments Acts 1930–2004.

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ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by Westmeath County Council (WCC) and the National Roads Authority (NRA), undertook an excavation in the townland of Kilbeg at the site of Kilbeg 2 in advance of the proposed N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme (Figure 1). The following report describes the final results of archaeological fieldwork at that site. The area was fully excavated by Fintan Walsh under Ministerial Direction (A016/060) and NMS Registration Number E2689 issued by the DOEHLG in consultation with the National Museum of Ireland. The fieldwork took place between 22 March and 3 April 2006.

This site was located on marginal land on the edge, and north of, a east–west flowing stream. An area, 35m by 18m, was stripped at Kilbeg 2 to reveal a burnt mound deposit (14m east–west x 8m north–south x 0.5m deep) defined by six charcoal rich deposits with inclusions of heat affected stone. Ash brushwood (*Fraxinus excelsior),* from the burnt mound returned an early Bronze Age 2 Sigma calibrated date of 1880–1690 BC. Fourteen cattle bones were recovered, some of which had evidence of cut marks. Kilbeg 2 was part of a larger cluster of burnt mounds including Kilbeg 4, 5, 6, 7 and Correagh 1 located between 50m–1.2km to the east and Kilbeg 1, positioned 600m to the west.

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1 INTRODUCTION

1.1 General

This final archaeological report describes the results of the excavation carried out at the site of Kilbeg 2 in the townland of Kilbeg, Co. Westmeath (Figures 1 and 2). The excavation was undertaken as part of an archaeological mitigation program associated with the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme. Archaeological fieldwork was carried out under ministerial direction by Fintan Walsh of Irish Archaeological Consultancy Ltd (IAC Ltd) and was funded by WCC & NRA under the National Development Plan 2000–2006, 2007–2013 and the EU Structural fund.

Kilbeg 2 was identified as a result of archaeological assessment undertaken by IAC Ltd. in July 2005 (Ministerial Direction No A016/029; NMS Registration No. E3273). All features identified during the assessment phase (a burnt mound spread) were subsequently re-identified and the site was fully excavated during the resolution phase of the project which took place between 22 March and 3 April 2006 with a team of 1 director, 1 supervisor and a maximum of 10 site assistants.

The site was located on boggy/marginal land immediately north of a small stream at a height of 66m OD c. 4.5km northwest of Kilbeggan (Westmeath OS sheet 037). Kilbeg 2 had not been previously identified and was not a recorded monument.

The site was assigned the following identification data:

Site Name: Kilbeg 2; Ministerial Direction Number.: A016/060; NMS Registration Number: E2689; Route Chainage (Ch): 24220–24240; NGR: 228870/236700.

1.2 Proposed Development

The proposed N6 Kinnegad–Athlone Scheme is to be constructed in two phases. The Phase 2 Kilbeggan–Athlone scheme will consist of a dual carriageway that will run for a distance of approximately 29km. The location of the route is predominantly to the south of the existing N6 and there will be access to the local road network through the seven grade separated junctions located at Athlone, Farnagh, Moate and Kilbeggan. The cross-section of the mainline consists of 2m wide verges, 2.5m wide hard shoulders, 7m wide two-lane carriageways and a 3m wide central reserve. This central reserve will accommodate 1m hard strips and a safety barrier. In addition to the mainline dual carriageway there is a further 0.3 km of standard dual carriageway to the south of Athlone Interchange to connect to the existing N6 and 1.2km to the south of Kilbeggan Interchange to connect to the existing N52.

1.3 Archaeological Requirements

The archaeological requirements for the N6 Kilbeggan to Athlone Dual Carriageway Scheme, are outlined in the Ministerial Directions issued to Westmeath County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930–2004 and in the terms of the contract between Westmeath County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Kilbeggan South, Co. Westmeath and Creggan Lower, Co. Westmeath.

The proposed N6 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Sheila Lane and Associates and presented in 2003. The Record of Monuments and Places, the Sites

and Monuments Record, Topographical files, aerial photography, the Westmeath Archaeological Urban Survey and literary sources were all consulted. One phase of geophysical survey was also conducted at selected sites along the proposed route by Target Archaeological Geophysics. As a result of the paper survey, field inspections and geophysical survey, a number of potential sites were recorded in proximity to this section of the overall route alignment.

Advance archaeological testing was completed by IAC Ltd and excavation of the sites identified during testing was conducted by IAC Ltd on behalf of Westmeath County Council.

1.4 Methodology

The topsoil was reduced to the interface between natural and topsoil using a 20 tonne mechanical excavator 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. These photographs were supplemented by specialist aerial photography.

An environmental strategy was devised at the beginning of the excavation. Where relevant features exhibiting large amounts of carbonised material were the primary targets.

In the instances where artefacts were uncovered on site they were dealt with in accordance with the guidelines as issued by the NMI and where warranted in consultation with the relevant specialists. All artefacts, ecofacts and paper archive are currently stored in IAC offices, Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

Radiocarbon dating of the site was carried out by means of AMS (Accelerator Mass Spectrometry) dating of identified and recommended charcoal samples. All calibrated AMS dates in this report are quoted to 2 Sigma.

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 EXCAVATION RESULTS

A single burnt mound was identified at Kilbeg 2 and is described as a single phase of archaeological activity (Phase 2). Phase 1 describes the subsoil, Phase 3 describes the topsoil. Detailed descriptions of the contexts are listed in Appendix 1. The site matrix is detailed in Figure 5.

2.1 Phase 1: Natural Drift Geology

The dominant bedrock geology identified along the corridor of the proposed route are Lower Carboniferous rocks, mainly limestone lithologies, which overlay Devonian Old Red Sandstone rocks. Carboniferous volcanic rocks were also identified as being present locally in the form of sills passing through the bedrock sequences (Riada Consult, 2003). The underlying geology of the area is overlain by occasional moraines and small glacial hillocks covered by grey brown podzolic soils.

The subsoil C2 above bedrock encountered at Kilbeg 2 was uniform across the site and consisted of a compact grey sandy clay.

2.2 Phase 2: Early Bronze Age Burnt Mound

The burnt mound deposit was the only archaeological material/feature identified (Figures 4, 5; Plates 1–4). It was central to the site area.

2.2.1 Burnt Mound Material

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
3	N/A	11.92	6.75	0.3	Irregular, mid brown silty clay, burnt stones	Disturbed mound deposit
4	N/A	13.88	7.61	0.54	Dark brown/black sandy silt, burnt stones	Burnt mound material
5	N/A	9.12	3.8	0.5	Dark brown clay with heat affected stones	Burnt mound material
6	N/A	5.18	3.1	0.3	Brown clay with heat affected stones	Burnt mound material
7	N/A	2.57	1.8	0.34	Reddish sandy clay and un-burnt stones	Burnt mound material
8	N/A	N/A	N/A	N/A	Sticky mid brown clay with wood	Original ground level

Finds: None

Interpretation:
This represents the accumulation of residual clay and heat affected stone deposits which constituted the burnt mound identified at Kilbeg 2 (Figures 4, 5; Plates 2, 3). The identified material comprised six layers (65.6m OD at bottom of mound – 66.2m OD at top of mound), and in total was 14m east–west by 8m north–south and c. 0.50m deep. The primary deposit (C8) was probably remnants of the original ground level. This deposit did not contain heat-affected stone; it was an organic rich layer with inclusions of natural occurring wood.

The primary archaeological deposit was C6 which was only evident in the western half of the mound. This was overlain by the main burnt mound deposit (C4). Deposit C4 was charcoal rich and contained the highest concentration of heat affected stone. A small fragment (0.3g) of ash brushwood (*Fraxinus excelsior*) recovered from deposit C4 returned a date of 3455+/-32 BP (UBA 8613). The 2 Sigma calibrated result for this was 1880–1690 BC (Appendix 2.3) dating this deposit to the early Bronze Age.

Seven taxa types were identified from charcoal retrieved during sieving from deposit C4 (O'Carroll, Appendix 2.2). Of these alder was the most dominant with ash (*Fraxinus excelsior*), *Prunus* spp, willow (*Salix* sp.), pomoideae, hazel (*Corylus avellana*) and oak (*Quercus* sp.) in descending order.

Deposit C7 was a similar deposit of heat-affected stone within C4. These deposits were overlain by disturbed burnt mound material (C3 and C5).

The upper layers (C3 and C5) were irregular in shape and exhibited greater evidence of disturbance. These layers were less compacted and mixed with the topsoil in places. They may be the result of recent agricultural activity on and around the site.

There were no other features identified on the site in association with these deposits. There was no evidence of a trough, hearths or associated features. The burnt mound material did not fill any subsoil cut features, though some of the deposits had settled within natural depressions.

Fourteen bone fragments with a total weight of 289g were retrieved from deposits C6, C7 and C8. The only animal identified was *Bos taurus* (cattle) and the lack of duplicate bone fragments suggests that they all were from the one individual (Lofqvist, Appendix 2.1). This animal was older than 3 years at time of death and there was evidence of butchery in the form of cut and chop-marks (*ibid.*).

2.3 Phase 3: Topsoil

2.3.1 Topsoil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
1	N/A	Site	Site	0.3	Mid brown peaty clay	Topsoil

Finds: None

Interpretation:
Phase 3 represents the topsoil that sealed all of the archaeological deposits and features at Kilbeg 2.

3 SYNTHESIS AND DISCUSSION

3.1 Landscape Setting

The new route of the N6 runs from south of Kilbeggan town to east of Athlone Co. Westmeath, crossing through the northern part of Co. Offaly for approximately 7.5km of its entire length. The landscape of this area is comprised of generally flat to undulating terrain. The underlying geology of the area is dominated by carboniferous limestone and is overlain by occasional glacial features such as moraines and eskers. The eskers dominate to the north and south of most of the route, with moraines featuring along parts of the western section toward Athlone. The soil cover varies considerably across the scheme, passing through soil complexes, grey brown podzols, boglands and alluvial deposits. The area is drained by the River Shannon through its tributaries, the Brosna, Boor, Cloghatanny and Gageborough rivers.

The site at Kilbeg 2 was located 4.5km northwest of Kilbeggan town in boggy/ marginal low-lying land (66m OD). The underlying geology of the area is carboniferous limestone, which is overlain with occasional small glacial hillocks, forming a gently undulating low-lying landscape. To the north of the site is a small ridge of eskers which extends northwest towards the village of Horseleap. Soil cover in this area consists of grey brown podzolics of the Patrickswell series. The site was located immediately north of a small stream/tributary of the Gageborough River. The 25" OS map (1887–1913) recorded several of the fields in the area to have been marshy land with occasional rock outcrops, this site been situated in one. The marsh area extends into the townland of Correagh and Kilbeg.

3.2 Archaeological Landscape (Bronze Age)

Apart from the publication of archaeological inventories in some midland counties, such as Offaly (O'Brien and Sweetman 1997), and peatland surveys by the Irish Archaeological Wetland Unit (Moloney *et al*. 1993), our knowledge of the prehistoric archaeology of the midlands is limited (there is no archaeological inventory for Co. Westmeath). We are reliant on data stored at the RMP (see Appendix 3) and information from a limited number of excavations within Westmeath and Offaly. The most important of these is Hencken's (1942) investigation at Ballinderry crannog II in the barony of Kilcoursey, Co. Offaly, which revealed a late Bronze Age settlement phase (see also Newman 1997). This picture is quickly changing as a result of commercially-driven archaeology such as the gas pipeline to the west (Grogan *et al*. 2007) which runs mostly parallel a short distance to the north of the N6, and excavations in advance of this road scheme.

The gas pipeline archaeological investigations have been extremely informative for identifying a range of archaeological sites in south Westmeath a county which has traditionally witnessed only minor scholarly research (Grogan *et al*. 2007, 24). This is most apparent for the Bronze Age as both the gas pipeline and excavations along the N6 have identified a wealth of domestic and burial evidence covering the early, middle and late parts of the period.

The area immediately surrounding Kilbeggan contains direct evidence for a range of Bronze Age sites including barrows, cists and an early Bronze Age pit burial (Grogan *et al*. 2007, 138, fig. 6.6). The cists, at Ardballymore (WM037-009) and Kilgaroan (WM037-010), are located in close proximity to a number of sites impacted by the N6 including those in the townlands of (moving east to west) Kilbeggan South, Tonaphort, Ballinderry Big, Kilgaroan, Ardballymore, Ballinderry Little, Correagh and Kilbeg. This is significant because sites within the majority of these townlands (except Ballinderry Little 1 which was not dated) have produced early to late Bronze

Age evidence almost exclusively represented by burnt mounds or components of these.

Prior to the gas pipeline, a small number of excavations had occurred to the north and the northeast of the N6 including the cemetery sites at Knockast (Hencken and Movius 1934; Grogan 2004), Edmondstown (Mount and Hartnett 1993) and Ballybrennan, Barrettstown and Redmondstown (see Waddell 1990). Added to this is the crannog at Coolure, on Lough Derravarragh within the barony of Moycashel, which was the focus of archaeological survey, environmental investigation and artefactual and landscape research (O'Sullivan *et al*. 2007). The island was first occupied in c. 850 BC, during the late Bronze Age, and several late Bronze Age weapons and ornaments have been recovered nearby in the small bay (*ibid*.). The gas pipeline excavations have added considerably to our knowledge of the Bronze Age in this region and Grogan *et al*. (2007, 139) have identified three principal Bronze Age focal zones in –

- The valleys of the Brosna and Clodiagh rivers to the south and east of Kilbeggan.
- The hilly terrain around the Hill of Uisneach.
- The slightly elevated area around Edmondstown to the west of Killucan.

Before the gas pipeline and N6 excavations south Westmeath was considered a 'quiet' zone but a much more intensive Bronze Age landscape has emerged possibly related to the major Bronze Age centre at Knockast (*ibid*., 161). The pipeline revealed a dominance of Bronze Age archaeology mainly dating to the middle and late parts of the period. Settlement, for example, is indicated by the middle Bronze Age house at Knockdomny 3km northwest of Moate town (Hull 2006), and by a number of burnt mounds such as Ballynagarbry, directly to the west of Moate, and at Williamstown (Grogan *et al*. 2007, 139). The N6 traversed the latter townland and revealed a burnt spread dating to the late Bronze Age.

Important late Bronze Age settlements were uncovered in advance of the N6 including the possible house at Creggan Lower 1 and the house, boundary fences and pits at Tober 1. The large rectangular late Bronze Age house at Ballinderry crannog II (Newman 1997 has since argued for the presence of a second rectangular Bronze Age structure) was identified as a thin black deposit which contained occupational debris and fragments of timbers and brushwoods and produced many finds including pottery, knives, flesh-hooks, awls, rings, pins, beads and a variety of stone objects (Hencken 1942, 6–8). When added together these sites demonstrate that this was a well-settled and established region notably in the later part of the period. This interpretation is further reinforced by the large number of burnt mounds that were discovered along the N6 and some notable clusters within certain townlands, for example, at Cregganmacar, Burrow or Glennanummer and Kilbeg.

In Athlone, at the western edge of the scheme and close to Creggan Lower, an assortment of high-status Bronze Age artefacts, mainly dating to the middle and late periods, are well represented including, for example, a gold lunula, bronze flat axes and rapiers and later gold items such as bar torcs, penannular bracelets, dress fasteners and ring money (Murtagh 2000, 9). The distribution of further high-status artefacts including the hoards from Ballinderry, Killulagh, Brockagh and Enniscoffey provide further evidence of a well settled Bronze Age landscape in this region (Eogan 1983; Grogan *et al.* 2007, 161). Both the pipeline and N6 excavations have demonstrated how quickly perceptions and knowledge of archaeological landscapes can change as new sites are revealed in areas previously thought to be mostly devoid of such.

Finds listed in the National Museum of Ireland archives from the Kilbeg area.
In Kilbeg townland (OS sheet 37): two fragments of horse trappings, bronze and iron, and three iron axeheads (1935:404–8) are listed. The find-spot is marked on OS map between and just below the L and B of Kilbeg which is 550m NNW of Kilbeg 2.

In July 1956 in the townland of Ardballymore, Co. Westmeath (2km to the southeast of Kilbeg 2) sherds of food vessel and cremated remains were found in a wedge-shaped tomb (possibly RMP WM037-009), in the course of a land rehabilitation project. Find spot noted as sheet 37.8 cm west x 29.3 cm south.

Early Bronze Age Kilbeg 2
Kilbeg 2 consisted of a burnt mound without any associated features such as troughs, hearths or pits and was dated to 1880–1690 BC. This site was one component of a large complex of burnt mound sites within this and adjoining townlands that were discovered in advance of the N6 (see Figure 2). The distance, moving west to east, between Kilbeg 2 and Kilbeg 6 was approximately 0.6km and this small area represented the densest cluster of burnt mound sites in the townland. Kilbeg 1 and Correagh 1 were each situated at the western and eastern edges of this cluster respectively. Kilbeg 1 was 0.6km to the west and Correagh 1 was 1.2km to the east.

Kilbeg 1, slightly more than 0.5km to the west of Kilbeg 2, consisted of a burnt mound that overlay a shallow trough and was dated to the late Bronze Age 1114–922 BC (Coughlan 2009a). Kilbeg 4 represented a cluster of seven burnt mound sites. A number of associated troughs, hearths and pits were revealed. Some troughs were wood-lined and others had distinctive associated gullies (Walsh 2009a). These burnt mounds were dated primarily to the early and middle Bronze Age.

At Kilbeg 5, two large burnt mounds (I and II) dated to the middle/late Bronze Age 1375–829 BC were each associated with a number of pits and troughs. Burnt Mound I had a circular trough and a possible structure that was defined by a number of postholes and a hearth. Burnt Mound II had a rectangular trough, with stakeholes located at its base, and a second trough which had a gully at its southern end (Walsh 2009b). Kilbeg 6, dated to the early Bronze Age (1923–1744 BC, 2 Sigma) consisted of a large burnt mound that sealed a trough with oak plank lining and a number of other pits and possible troughs (Lyne 2009a). This site also produced a late Neolithic-early Bronze Age date from an associated pit (2850–2480 BC, 2 Sigma). Another large burnt mound which sealed a wood-lined trough (with *in-situ* upright supports) was revealed at Kilbeg 7. In addition to this a brushwood deposit area and a roasting pit were also uncovered (McManus 2009). This site was dated to the early Bronze Age (2196–2029 BC, 2 Sigma). Two burnt mounds were identified at Correagh 1, located directly north of Kilbeg 7. Dates (2 Sigma) obtained from various features and troughs ranged from 2140–1129 BC reflecting repeated use of this site over a millennia. One of the burnt mounds sealed a timber-lined trough, a second clay-cut trough and pits (Lynch 2009a). The second also sealed a timber-lined trough, with two large posts at its east and west sides, a second trough and numerous pits (*ibid*.). Important finds from this site included a stone axe-head and a possible antler haft.

A number of burnt mound sites were identified c. 2km to the east in the townland of Kilgaroan. Kilgaroan 4 consisted of disturbed pockets of burnt mound spread, a potential trough and some pits (Bayley 2009a). Three evenly spaced postholes to the west of the trough may have supported a windbreak and one of the pits, again filled with burnt mound type material, produced a 2 Sigma date of 2023–1894 BC placing the site in the early Bronze Age. A number of various components of burnt mound

sites were also excavated in advance of the N6 in Kilgaroan. At Kilgaroan 2, a potential disturbed burnt mound spread was uncovered as well as some early medieval pits (Bayley 2009b). It appears that the burnt mound site was disturbed and re-deposited across the site.

Approximately 2.5km to the west, a couple of burnt mound sites were uncovered in the townland of Russagh. Russagh 2 consisted of a late Bronze Age burnt spread, dated to 1181–923 BC (2 Sigma), that overlay a trough (O'Carroll 2009a). A contemporary burnt mound site, a burnt spread that overlay charcoal-rich pits, was identified at Russagh 3 and was produced a similar 2 Sigma date of 1191–939 BC (O'Carroll 2009b).

The vast majority of burnt mound sites date to the Bronze Age and were most commonly utilised during the middle and later parts of the period (Brindley *et al* 1989/90; Corlett 1997). The burnt mound site at Kilbeg 2 was dated to the early Bronze Age and the majority of its neighbouring sites in Kilbeg and the surrounding townlands were also dated to this period indicating that this was a relatively well-settled area during the early part of the Bronze Age.

A number of burnt mound sites on the N6 consisted only of a mound or spread without any associated features. Examples include Seeoge 1 (Lyne 2009b) and Cregganmacar 4 (Lynch 2009b), which dated to the middle and early Bronze Age respectively, and this is most easily explained by these features lying outside the roadtake.

A number of other burnt mound sites – consisting only of mounds or spreads without any associated features – have been excavated in this region and include Ballinderry Whitewell (Phelan 2007, 334), Ballybrennan (Molloy 2007a, 334), Belfield (Molloy 2007b, 335–6), Cloonagh (Molloy 2007c, 336), Griffinstown (Molloy 2007d, 346) Rathcarn/Lemongrove (Molloy 2007e, 349) and Syonan (Molloy 2007f, 349). All these sites were revealed in Co. Westmeath in advance of the gas pipeline to the west (Grogan *et al* 2007). A final example includes a small irregular burnt mound deposit at Newtown 2, close to Mullingar, that was dated to 1120–850 BC (Stevens 2004a), and this site formed part of a wider group of burnt mounds in the same townland at Newtown 1 (Stevens 2004b) and Newtown 3 (Stevens 2004c).

In summary the burnt mound site at Kilbeg 2 is paralleled by a number of similar sites that were revealed along the N6 between Athlone and Kilbeggan. The presence of a number of burnt mounds in Kilbeg townland is replicated in other townlands, for example, at Cregganmacar, Burrow or Glennanummer and Williamstown and this was also evident at Newtown and Enniscoffey/Caran (Molloy 2007g, 2007h, 2007i, 341–2), during excavations in other parts of Co. Westmeath. Archaeological investigation on other sections of the N6 has also uncovered various burnt mound sites, for example at Stonehousefarm 6.1 and 6.2 (McDermott 2004).

3.3 Archaeological Typology Background (Burnt Mounds)

Burnt mound sites (also commonly refereed 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 being 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).

3.4 Discussion

One main phase of archaeological activity was identified at Kilbeg 2, an early Bronze Age burnt mound. The specific archaeological context of the site and its phases are described in detail below.

3.4.1 Phase 1: Natural Deposits

The underlying limestone geology of the area is overlain by occasional moraines and small glacial hillocks covered by grey brown podzolic soils.

The subsoil C2 above bedrock encountered at Kilbeg 2 was uniform across the site and consisted of a compact grey sandy clay.

3.4.2 Phase 2: Early Bronze Age Burnt Mound

The early bronze age burnt mound at Kilbeg 2 (Figures 4, 5; Plates 1–4) was defined

solely by a large deep deposit of burnt mound material (heat fractured stone and charcoal rich clays). No associated trough, pits or other features were identified during the excavation, however it is possible that the trough was above ground, not subsoil cut, and therefore did not survive. The burnt mound material (14m east–west by 8m north–south and 0.50m deep; 65.6m OD at bottom of mound – 66.2m OD at top of mound) comprised six layers of burnt mound material or varying consistency, charcoal content, stone content.

The original ground level was identified (C8) which consisted of an organic rich layer with inclusions of natural occurring wood, which sealed the subsoil. The main burnt mound deposit (C4) was charcoal rich and contained the highest concentration of heat affected stone. A small fragment (0.3g) of ash brushwood (*Fraxinus excelsior*) recovered from deposit C4 returned a date of 3455+/-32 BP (UBA 8613). The 2 Sigma calibrated result for this was 1880–1690 BC (Appendix 2.3) dating this deposit and the burnt mound to the early Bronze Age. The upper layers C3 and C5 were irregular in shape and exhibited greater evidence of disturbance. These layers were less compacted and mixed with the topsoil in places. They may be the result of recent agricultural activity on and around the site. There were no other features identified on the site in association with these deposits. There was no evidence of a trough, hearths or associated features. The burnt mound material did not fill any subsoil cut features, though some of the deposits had settled within natural depressions.

The significance of the site in the Bronze Age landscape

Kilbeg 2 is located within a low-lying, wet, marginal landscape. The site was immediately north of a small stream/tributary of the Gageborough River. This landscape, and the water source provided by the east–west flowing river, was obviously attractive to the Bronze Age population as there is a distinct cluster of 15 burnt mounds between Kilbeg 1 and Correagh 1 (see Figure 2). All of these sites, with the exception of Kilbeg 1, were within 30–40m of the river. The dates obtained ranged from late Neolithic to late Bronze Age, with the majority of burnt mounds dating to the early Bronze Age. The sheer quantity, the quality of the archaeological remains, and the dating evidence suggest that this was an important, well-populated Bronze Age landscape, and perhaps these burnt mounds are located at the edge of, as yet unidentified, Bronze Age settlement in the immediate area.

The immediate area is undoubtedly an important Bronze Age landscape. There is also good evidence of Neolithic – Bronze Age transition in this area. At Ardballymore 2 (Bayley 2009c) c. 1.6km to the southeast, a small number of isolated pits were dated to 2830–2470 BC (2 Sigma) using hazelnut shell and another pit was dated to 2580–2457 BC (2 Sigma) using oak charcoal. The adjacent site (Ardballymore 1; Bayley 2009d) was also dated to 2859–2496 BC (2 Sigma) using oak charcoal. Hazel charcoal from a pit at the burnt mound Kilbeg 6 returned a 2 Sigma calibrated date of 2850–2480 BC (Lyne 2009a), while a polished stone axe was recovered from one of the burnt mounds at Correagh 1 (Lynch 2009a). The discovery of Beaker pottery at Cappydonnell Big 1 (Coughlan 2009b) c. 1.4km to the northwest is further evidence that this are was well-populated at this time. Kilbeg 2 would have been contemporary with the burnt mounds identified in adjacent Kilbeg 4 (Walsh 2009a).

Function and form

Although many ideas for the function of burnt mounds have been proposed and debated (see O'Kelly 1954, Lawless 1990, Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988, Jeffrey 1991, Quinn and Moore 2007 and McClatchie *et al*. 2007) it is clear that 'hot stone technology/burnt mound' sites like this were probably used for a variety of reasons. This could include any process that would require the need for hot

water, which is essentially what is produced. The presence of cattle bone (289g), within the burnt mound deposits at Kilbeg 2, some of which had evidence of butchering (cut and chop marks), may be evidence that meat was being cooked at Kilbeg 2.

The surrounding early Bronze Age environment
Seven taxa types were identified from charcoal retrieved during sieving from deposit C4 (O'Carroll, Appendix 2.2). Of these alder was the most dominant with ash (*Fraxinus excelsior*), *Prunus* spp, willow (*Salix* sp.), pomoideae, hazel (*Corylus avellana*) and oak (*Quercus* sp.) in descending order. The alder and willow are generally symptomatic of wetland environments (*ibid.*). This suggests that there may have been ash-hazel woodlands surrounding the site in the early Bronze Age (*ibid.*). The low occurrence of oak is unusual and suggests that either oak was not that prevalent in the surrounding environment or was not used as firewood at the burnt mound (*ibid.*). The identification of cherry/blackthorn (*Prunus* spp.), pomoideae and hazel suggests that scrubland areas surrounded the site, furthermore the presence of dryland and wetland trees reaffirms that the site at Kilbeg 2 was located on the cusp of a dryland and wetland area as it is today (*ibid*.).

3.4.3 Phase 3: Post-Abandonment
The site was abandoned in the early Bronze Age and was subsequently 'flattened'. The build-up of topsoil across the site over the years is representative of this phase of activity.

4 CONCLUSIONS

Kilbeg 2 was an early Bronze Age (1880–1690 BC) burnt mound defined solely by a large deep deposit of burnt mound material (heat fractured stone and charcoal rich clays). No associated trough, pits, or other features were identified during the excavation. Kilbeg 2 is located within a low-lying, wet, marginal landscape and is part of a distinct cluster of 15 burnt mounds identified in this area. The presence of butchered cattle bone from some of the mound deposits may be evidence that meat was being cooked at Kilbeg 2. The environmental (charcoal) remains suggest that there may have been ash-hazel woodlands surrounding the site while the identification of cherry/blackthorn, pomoideae and hazel suggests that there were also scrubland areas in the vicinity.

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PLATES

Plate 1: E2689: The Kilbeg landscape with Kilbeg 2 shown

Plate 2: E2689: South-facing section through burnt mound material

Plate 3: E2689: East-facing section through burnt mound material

Plate 4: E2689: Kilbeg 2 burnt mound, during excavation, facing northwest.

DIX 1 CATALOGUE OF PRIMARY DATA

ix 1.1 Context Register

Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Finds/ecofacts
N/A	N/A	N/A	0.30	Topsoil	Mid brown peaty clay	
N/A	N/A	N/A	N/A	Natural subsoil	Compact grey sandy clay	
N/A	11.92	6.75	0.30 (max) 0.14 (min)	Disturbed burnt mound material	Irregular shape in plan. Loose compaction. Mid brown silty clay and heat affected stones.	
N/A	13.88	7.61	0.54 (max) 0.29 (min)	Burnt mound material	Irregular/oval shape in plan. Loose compaction. Dark brown/black fine sandy silt and burnt cracked stones.	
N/A	9.12	3.80	0.50 (max) 0.15 (min)	Burnt mound material	Extended oval shape in plan. NW–SE orientation. Loose compaction becoming firm at the bottom. Dark brown clay with heat affected stones.	
N/A	5.18	3.10	0.30 (max) 0.10 (min)	Burnt mound material	Firm compaction. Brown clay with heat affected stones.	Animal bone
N/A	2.57	1.80	0.34 (max) 0.28 (min)	Burnt mound material	Firm compaction. Reddish sandy clay and unburnt stones. Possibly a deposit within deposit C4.	Animal bone
N/A	13.85	7.96	0.30 (max) 0.16 (min)	Original ground level	Sticky and moderate compaction. Mid brown clay with occasional fragments of natural occurring wood.	Animal bone

ix 1.2 Catalogue of Artefacts

ere no artefacts recovered from this site.

Appendix 1.3 Catalogue of Ecofacts

One soil sample was taken at Kilbeg 2. This was processed by flotation and sieving through a 250µm mesh and the results including charcoal are listed below. Animal bone samples were hand collected during excavation, the total results are listed below.

1.3.1 Animal bone/Burnt Bone

Context number	Sample number	Feature	Sample weight (g)
6	2	Burnt mound deposit	177
7	5	Burnt mound deposit	26
8	4	Burnt mound deposit	86

1.3.2 Charcoal

Context number	Sample number	Feature	Sample weight (g)
4	1	Burnt mound deposit	136.6g

Appendix 1.4 Archive Checklist

Project: N6 Kilbeggan – Athlone	**Irish Archaeological Consultancy Ltd**	
Site Name: Kilbeg 2		
NMS Registration Number: E2689		
Ministerial Direction No.: A016/060		
Site director: Fintan Walsh		
Date: 09 December 2008		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	1	
Site sections, profiles, elevations	4	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	1	
Survey/levels data (origin information)	26	
Context sheets	8	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	15	
Photographs (print)	0	
Photographs (slide)	0	
Finds and Environ. Archive		
Flint/chert	0	
Stone artefacts	0	
Pottery (specify periods/typology)	0	
Ceramic Building Material (specify types eg daub, tile)	0	
Metal artefacts (specify types - bronze, iron)	0	
Glass	0	
Other find types or special finds (specify)	0	
Human bone (specify type eg cremated, skeleton, disarticulated)	0	
Animal bone	3 samples	14 fragments
Metallurgical waste	0	
Enviro bulk soil (specify no. of samples)	1	
Enviro monolith (specify number of samples and number of tins per sample)	0	
Security copy of archive	1	On IAC server

Appendix 1.5 Copy of Registration No. Document from DoEHLG

National Monuments
Acts (1930-2004)
Ministerial Directions
Record Number for
archaeological activity

AN ROINN COMHSHAOIL, OIDHREACHTA AGUS RIALTAIS AITIUIL
DEPARTMENT OF THE ENVIRONMENT, HERITAGE
AND LOCAL GOVERNMENT

File: Direction No. A16

Registration Number: E2689

Directions have been issued to Murty Hanly on behalf of Westmeath County Council in order to regulate archaeological activities carried out on N6 Kilbeggan to Athlone (Phase 2).

Application having been duly made to me by Mr. Fintan Walsh of c/o I.A.C., 8 Dungar Terrace,, Dun Laoghaire, Co. Dublin.

For a registration number to record excavation at the site of Kilbeg 060 being part of the townland of KILBEG in the County of Westmeath.

This registration is not an archaeological licence or consent but it is issued solely for archive purposes and to allow for the material from the activity to be registered with the National Monuments Service and the National Museum.

Signed ..... 31 October 2006

Appendix 1.6 Copy of Ministerial Direction Document

Section 14A(2) National Monuments Acts 1930-2004

Directions to Westmeath County Council for the carrying out of archaeological works on the N6 Kinnegad to Athlone dual carriageway road scheme (Phase 2 * Kilbeggan to Athlone).

1. Introduction

The project is an approved road development, having been approved by An Bórd Pleanála on 26th March 2004.

The development will consist of a dual carriageway that will run for a distance of approximately 57.5km.

In line with recommendations in the Environmental Impact Assessment for the scheme, archaeological investigations included site specific testing followed by a centreline test trench with staggered offsets. The request for directions has an attached strategy document that covers the proposed resolution works

These directions relate to Phase 2 works and are issued following the receipt by the Minister of reports on the testing work carried out in Phase 1.

2. Directions

All aspects of the archaeological works should be conducted in accordance with provisions of the policy and advice notes on archaeological excavations issued by the Department and in line with the provisions of the Code of Practice agreed with the National Roads Authority. Archaeological works shall be carried out in accordance with the Strategy for Proposed Works submitted with the application seeking Directions.

3. Project Archaeologist

The Project Archaeologist appointed for the road development should ensure that the archaeological works are carried out in accordance with the terms of the directions.
· Any changes to the agreed method statement for the excavations should be submitted to the National Monuments Section for approval.
· Any proposal to change any named director of a specific excavation should firstly be notified to the National Monuments Section for approval.

4. Conduct of Archaeological Excavations:

a) The archaeological excavations should be carried out in accordance with the specifications set out in the strategy document submitted to the Minister.
b) The National Monuments Section should be notified of the commencement date of the works on site.
c) The names of the archaeological consultants, including site directors should be submitted to the National Monuments Section in advance of the works commencing.

d) Where necessary the layout of the archaeological trenches should be adjusted to include additional archaeological features and deposits or areas of archaeological potential.
e) All archaeological objects recovered in the course of the test excavations should be treated and conserved in line with the advice notes and guidelines issued by the National Museum of Ireland.
f) A report on the progress of the archaeological works shall be submitted to the National Monuments Section every 4 weeks.

5. Record Number for the scheme:

The record number for the recording of archaeological works is A016/000. Sub-numbers may be allocated by the Project Archaeologist to the additonal works. These numbers should be notified to the National Monuments Section for agreement with full details of the archaeological works involved.

6. Detection Device:

Detection devices may be used as appropriate in the course of archaeological works to recover archaeological objects. Details of proposed methodologies should be notified to the National Monuments Section.

7. Reports:

1. A report on the results of the archaeological excavations should be submitted to the National Monuments Section within 4 weeks of the completion of the works on site. Should additional time be required to complete the report the National Monuments Section should be notified before the expiration of the 4-weeks period. A copy of the report should be sent to the National Museum of Ireland.
2. A summary of the excavation results for the site should be published in the Excavations Bulletin for the year when works are undertaken.

8. National Monuments (Subsection 14A(4)):

If during the carrying out of the archaeological excavations a site should prove to be a National Monument within the meaning of the National Monuments Acts (1930-2004) all works should stop and the National Monuments Section should be informed immediately.

9. Inspection of Works

Officers, servants or agents of the Minister may inspect the archaeological works at any time and full co-operation should be given to them in carrying out the inspections.

APPENDIX 2 SPECIALIST REPORTS

OSTEOARCHAEOLOGICAL REPORT
OF
ANIMAL BONES
FROM A016/60 KILBEG 2,
N6 ATHLONE TO KILBEGGAN ROAD SCHEME
COUNTY WESTMEATH

MOORE GROUP

ANIMAL BONE REPORT PREPARED FOR IAC LTD

AUTHOR: CAMILLA LOFQVIST,
OSTEOARCHAEOLOGICAL SERVICES SECTION

DATE: DECEMBER 2007

Introduction
The Osteoarchaeological Services Section of Moore Group was commissioned to undertake an osteoarchaeological analysis of disarticulated animal bones retrieved during archaeological work at A016/060 Kilbeg 2, N6 Athlone to Kilbeggan Road Scheme, Co. Westmeath. The osteoarchaeological analysis was carried out on behalf of IAC Ltd.

The purpose of this report is to broaden the understanding of animal consumption and animal husbandry at the site, through the osteological study of the animal remains. The aim is to use the bones as a means of archaeological interpretation of the site, either to support suggested theories or to point to other possible interpretations of the cultural heritage. As the osteological materials contain a large quantity of information; it is important from the start, to define the type of information that is going to be collected. The data gathered from this report was based on five different variables:

- Species distribution
- Anatomical distribution
- Age distribution
- Sex ratios and size variations
- Cut-/gnaw-marks and disease distribution.

In order to enable comparisons between the different materials it is important to be consistent in the use of analysis methods. If this is not fulfilled, the results would be impossible to compare. The osteological methods used in this report are presented in the section below.

Methodology
Identification of the bones was made by reference to Sisson and Grossman *The anatomy of the Domestic Animals* (Getty 1975), Schmid *Atlas of Animal bones* (1972), Hillson *Teeth* (1996), During´s *Bildkompendium i Animalosteologi* (unpubl) and a comparative collection of bones belonging to the author. A systematic bird bone identification was made by reference to Cohen & Serjeantson *A Manual for the Identification of Bird bone from Archaeological Sites* and where possible, the bones were identified to family level.

During analysis of the material, all fragments were counted and identified to species, anatomical unit, part of anatomical unit, side and fusion stage. Pathology and cut/gnaw marks were also examined. Quantification was based on three methods:

NISP: Number of Identified Specimens. Indicates the total number of fragments found. The NISP is decided by different factors like the age of the animal, the size of the animal and how well the preservation was at the place where the bones were deposited.
MNI: Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. The MNI is calculated on the specimen of the most abundant skeletal element present, taking left and right side in consideration, as well as looking at the age of the animal. However, it is important to point out that MNI is only an estimate.
MNE: Minimum Numbers of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. MNE is used to calculate MNI and is used in the Fusion data tables. To allow for a young individual to grow the bones from a juvenile at birth are made up of several different parts. When the individual gets older the different parts grow together and form one bone. The parts of the bone

grow together at different age-stages and this makes it possible to estimate the age of an animal. This means that three bone fragments can be part of the same bone element. For example: Proximal and distal epiphyses fused with the diaphysis. To avoid getting a higher MNE all loose epiphyses have to be paired with all unfused diaphysis.

Age is based on fusion data and tooth eruption. Habermehl (1961) and Silver (1969) have been used to determine stages of fusion while Schmid (1972) and Hillson (1996) have been used to determine tooth eruption data. It should be noted that bone elements from juveniles are often under-represented in bone materials, because they are very fragile and very easy to break.

Different formula are used to calculate Estimated Shoulder Heights (ESH) for the different species. Matolsci (1970) and Fock (1966) are used to estimate height of withers for cattle while Teichert (1975) is used for sheep.

The average height of withers and average weight of the meat-producing animals has increased from Bronze Age to Modern time. For example, cattle during medieval times had an average height of 1.05m but by the late 18th century had this increased to an average height of 1.35m (Davis, 1987:178; tab 8:7). Along with size, the average weight of the animals had increased. The dressing-out weight for cattle and caprinae is 50% of the animal's total, live weight. The dressing-out weight for pig is 80% of the animal's total weight (McCormick, 1997:200). The size figures of cattle are based on Davis (1987:178; tab 8:7).

The genders of the animals are estimated from measurements of the horncore and the coxae. For cattle, Armitage & Clutton Brock (1976) is used for the estimation based on the horncore and Vretemark (1997) for the estimation based on the coxae. For caprinae Vretemark (1997) is used for the coxae. For pig and horse, the upper and lower Canine teeth are used to determine the sex.

The bones were searched for traces of gnawing, cut marks and pathology. The gnaw marks give information about how exposed the bones were after being discarded. A high percentage of bones with traces of gnawing indicates that the bones were left exposed so animals like dogs, rats and other scavengers had access to the bones. The cut marks can give valuable information about how the carcasses were butchered. These marks can also give information about if the animals were kept for their milk, as a source of meat, or if they played an important part in industrial production of for example hide or bone objects.

Result

Fourteen bone fragments were submitted for examination. These were examined and all fragments were identified to species. The animal species identified in the material was: *Bos taurus* (Cattle) (Table 1)

Showing the total number of fragments (NISP), total number of anatomical elements (MNE), total number of individuals (MNI) and total weight for all species present.

Species	NISP	NISP in %	MNE	MNE in %	MNI*	MNI in %	Weight	Weight %
Cattle	14	100%	8	100%	1	100%	289	100%
Grand total	14	100%	8	100%	1	100%	289	100%

Table 1. NISP, MNE, MNI and weight for all species. (*MNI=Minimum Number of Individuals)

The condition of the bone was in general fair but fragmented. Only two anatomical units, two tarsals, were fairly complete. The average weight per fragment of the 14 fragments identified to species was 20.6g.

Cattle; Bos

Fourteen bone fragments from eight anatomical units were retrieved from Kilbeg 2 and they were all identified as cattle. The fragments identified were tarsals, tibia, skull, metatarsal and radius. From a fairly complete tarsal (calcaneus) it can only be concluded that this individual was older then 3 years at time of death, as that is the time of fusion for this bone element. The total weight of the cattle bone was 289g.

Only one bone, an astragalus, was measured but unfortunately this bone can not be used in an estimation of stature:

GLl: 61.91, GLm: 56.14, Bd: 36.83mm

Five bone fragments (c. 36% of the total number of bone) had traces of cut-marks. These were tibia, metatarsal and radius fragments and all had their diaphyses chopped up, indicating that the animal had been slaughtered and butchered.

Cattle were valued for their meat, hides, milk and traction power. They are less adaptable than sheep in areas of sparse, low-quality grazing, or in arid regions, or in mountain regions.

Summary

Fourteen bone fragments (14) with a total weight of 289g were submitted for examination. The bone sample was assessed and identified to species level. The animal identified was cattle and the lack of duplicate bone fragments suggests that they all were from the one individual. This animal was older than 3 years at time of death and several (36%) of the fragments displayed cut and chop-marks suggesting butchering.

No definite conclusions could be made from the Kilbeg 2 bone assemblage due to the limited size of the bone sample.

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CHARCOAL IDENTIFICATIONS

N6 KINNEGAD – ATHLONE SCHEME
PHASE 2: KILBEGGAN TO ATHLONE
DUAL CARRIAGEWAY

MINISTERIAL DIRECTION NUMBER: A016/060
NMS REGISTRATION NUMBER: E2689
KILBEG 2

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1. Introduction

One charcoal sample was identified from excavations from a disturbed burnt mound dated to the early Bronze Age and excavated at Kilbeg 2, Co. Westmeath. This site is located in the townland of Kilbeg, c. 5km west of Kilbeggan town, Co. Westmeath. The archaeological excavation was carried out by Irish Archaeological Consultancy Ltd on behalf of Westmeath County Council and the National Roads Authority in advance of the construction of the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme.

The analysis of charcoal can provide information on two different levels. Charcoal analysis is an important component of any post-excavation environmental work as it can help in re-constructing an environment hitherto lost to us, although this must be done with caution as sufficient sample numbers are required for a complete and full understanding of the immediate environment. Keepax suggests 50 samples in a European temperate climate. Charcoal is also analysed and identified to determine what species are used and selected for particular functions on site i.e. postholes, wall posts, burnt remains of wattle and so on.

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). A wood reference collection from the Botanical Gardens in Glasnevin, Dublin was also used.

Charcoal

The soil samples were processed on-site. The flots were sieved through a 250 micron or a 1mm sieve, while the retent was put through a 2mm or 4mm sieve. All of the charcoal remains from the soil samples were then bagged and labeled.

The identification of charcoal material involves breaking the charcoal piece along its three sections (transverse, tangential and radial) so clean sections of the wood pieces can be obtained. This charcoal is then identified to species under a universal compound microscope reflected and transmitted light sources at magnifications x 10–400. By close examination of the microanatomical features of the samples the charcoal species are determined.

The purpose of the charcoal identifications was two-fold. In some cases the identifications were carried out prior to C14 dating in order to select specific species for dating and in other cases the charcoal was analysed for fuel selection policies and selection of wood types for structural use. Each species was identified, bagged together and then weighed. Insect channels were noted on the charcoal fragments identified as this may indicate the use of dead or rotting wood used for fuel or other such functions. The distinction can sometimes be made between trunks, branches and twigs if the charcoal samples are large enough. This was noted where possible. When charcoal samples showed indications of fast or slow growth this was also recorded. The samples identified for environmental reconstruction and wood usage were counted per fragment and then weighed. The smaller sample amounts with less than 50 fragments were all identified while 50 fragments were identified from the larger samples.

There are inherent problems in re-constructing the environment at the time of use of the site due to the low quantity of samples and charcoal fragments identified from the assemblages. Notwithstanding the charcoal sample numbers, it is clear that the charcoal results coupled with the wood analysis throw up some interesting results

and trends in relation to wood selection and use and woodland cover in the early Bronze age period in Co. Westmeath.

A number of wood taxa cannot be identified to species or sub-species level anatomically. Sessile oak *(Quercus petraea)* and pedunculate oak *(Quercus robur)* are both native and common in Ireland and the wood of these species cannot be differentiated on the basis of their anatomic characteristics. English elm *(Ulmus procera)* and wych elm *(Ulmus glabra)* cannot be separated by their wood structure and identifications of elm are shown as *Ulmus* spp. There are also two species of birch (*Betula pendula* and *Betula pubescens*) and several species of willow therefore the identifications are given as *Betula* spp and *Salix* spp respectively. *Prunus* includes blackthorn (*Prunus spinosa*) and cherry (*Prunus padus/avium*) and sometimes it is difficult to differentiate between the different species of *Prunus* spp.

3. Description of the feature types

The site at Kilbeg 2 comprised a burnt mound deposit defined by six charcoal rich deposits with inclusions of heat affected stone. Overall the deposit was 14m long, 8m wide and 0.5m deep. There was no evidence of a trough, hearths or associated features. No finds were discovered during the course of excavation. Charcoal from the burnt mound has been dated to the early Bronze Age (1880–1690 BC).

4. Results

Fifty one fragments were identified from one sample submitted for dating and environmental re-construction and woodland use. The charcoal (C4) is related to the burnt mound spread. The fragment count of each taxon represented in the samples is given below in Figure 1 and Table 1.

Figure 1: All taxa identified from the charcoal samples analysed

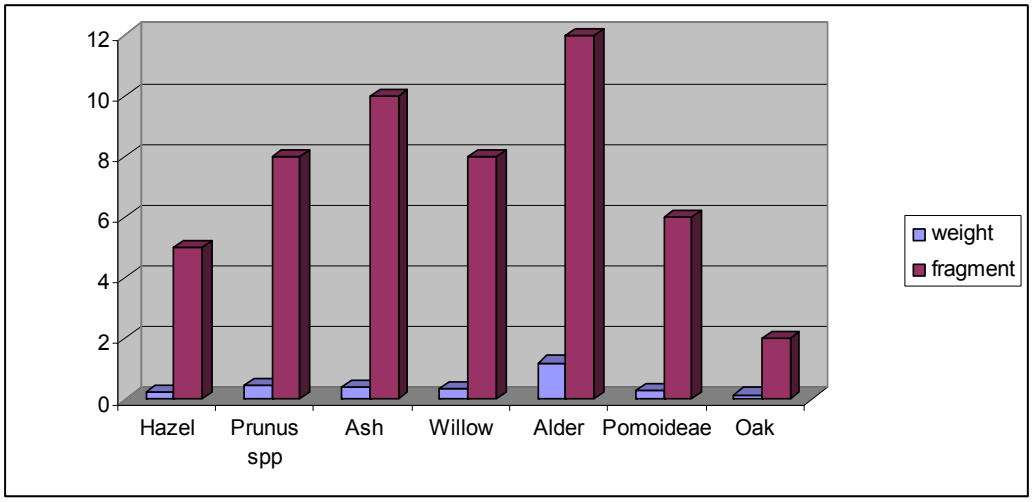

Table 1: Identifications from Kilbeg 2

Site no.	Context no.	Context type	Sample no.	Species	Date
A016-60/ E2689	4	Burnt spread	1	Ash (0.4g*, 10f*), Oak (0.15g, 2f), *Prunus* spp (0.45g, 5f), Hazel (0.21g, 5f), Alder (1.2g, 12f), Willow (0.35g, 8f), Pomoideae (0.6g, 3f)	Insect channels 1880–1690 BC

*g = grammes * f = fragment count

5. Discussion and Conclusions of Charcoal assemblage

Wood types identified the assemblages

There were seven taxa types present in the charcoal remains. Alder was the most dominant taxon identified from the assemblage with ash, *Prunus* spp, willow, pomoideae, hazel and oak in descending order. The identifications are related to wood selection in relation to firewood used at the site rather than structural wood use.

The range of taxa identified from the features analysed includes large trees (oak & ash), medium sized trees (alder) and smaller scrub or hedgerow trees (hazel, *Prunus* spp – cherry/blackthorn, willow and pomoideae). Alder and willow are generally symptomatic of wetland environments.

The results suggest that there may have been ash-hazel woodlands surrounding the sites during the early Bronze Age period at Kilbeg 2. There was only two fragment counts of oak present in the assemblage which suggests that either oak was not that prevalent in the surrounding environment or was not used as firewood at the burnt mound sites. Scrubland areas were also present with the identifications of cherry/blackthorn, pomoideae and hazel. As with most burnt mound sites the presence of dryland and wetland trees indicate that the burnt mound was located on the cusp of a dryland and wetland area.

Further analysis, discussions and comparisons of results will form part of a final integrated charcoal and pollen study of the sites and the surrounding environment on this scheme which is being undertaken as part of the authors PHD thesis. These results will be published accordingly.

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RADIOCARBON DATING RESULTS
KILBEG 2

CHRONO LABORATORY, QUEENS UNIVERSITY BELFAST

Colette Rynhart
Irish Archaeological Consultancy Ltd
120b Greenpark Road
Bray
Co. Wiklow, Ireland
Rep. of Ireland
VAT No. IE8288812U

^{14}CHRONO Centre
Queens University Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification: UBA-8613
Date of Measurement: 2008-04-04
Site: A016/60 Kilbeg
Sample ID: S1 C4
Material Dated: Ash Brushwood
Pretreatment: AAA
Submitted by: IAC

^{14}C Date: 3455±32
AMS δ^{13}C: -24.2

Information about radiocarbon calibration

```
            RADIOCARBON CALIBRATION PROGRAM*
                      CALIB REV5.0.2
        Copyright 1986-2005 M Stuiver and PJ Reimer
*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.
          Annotated results (text) - -
          Export file - c14res.csv
```

```
S1 C4
UBA-8613
Radiocarbon Age BP    3455 +/-    32
Calibration data set: intcal04.14c                  # Reimer et al. 2004
  % area enclosed       cal AD age ranges               relative area under
                                                      probability distribution
  68.3 (1 sigma)      cal BC 1873- 1844                       0.283
                             1815- 1800                       0.119
                             1778- 1736                       0.458
                             1712- 1695                       0.140
  95.4 (2 sigma)      cal BC 1880- 1837                       0.246
                             1833- 1690                       0.754
```

```
 References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, C Bertrand, PG Blackwell,
  CE Buck, G Burr, KB Cutler, PE Damon, RL Edwards, RG Fairbanks, M Friedrich,
  TP Guilderson, KA Hughen, B Kromer, FG McCormac, S Manning, C Bronk Ramsey,
  RW Reimer, S Remmele, JR Southon, M Stuiver, S Talamo, FW Taylor,
  J van der Plicht, and CE Weyhenmeyer (2004), Radiocarbon 46:1029-1058.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

NOTE:  Cal ages and ranges are rounded to the nearest year which
       may be too precise in many instances.  Users are advised to
       round results to the nearest 10 yr for samples with standard
       deviation in the radiocarbon age greater than 50 yr.
```

APPENDIX 3 LIST OF RMP SITES IN AREA

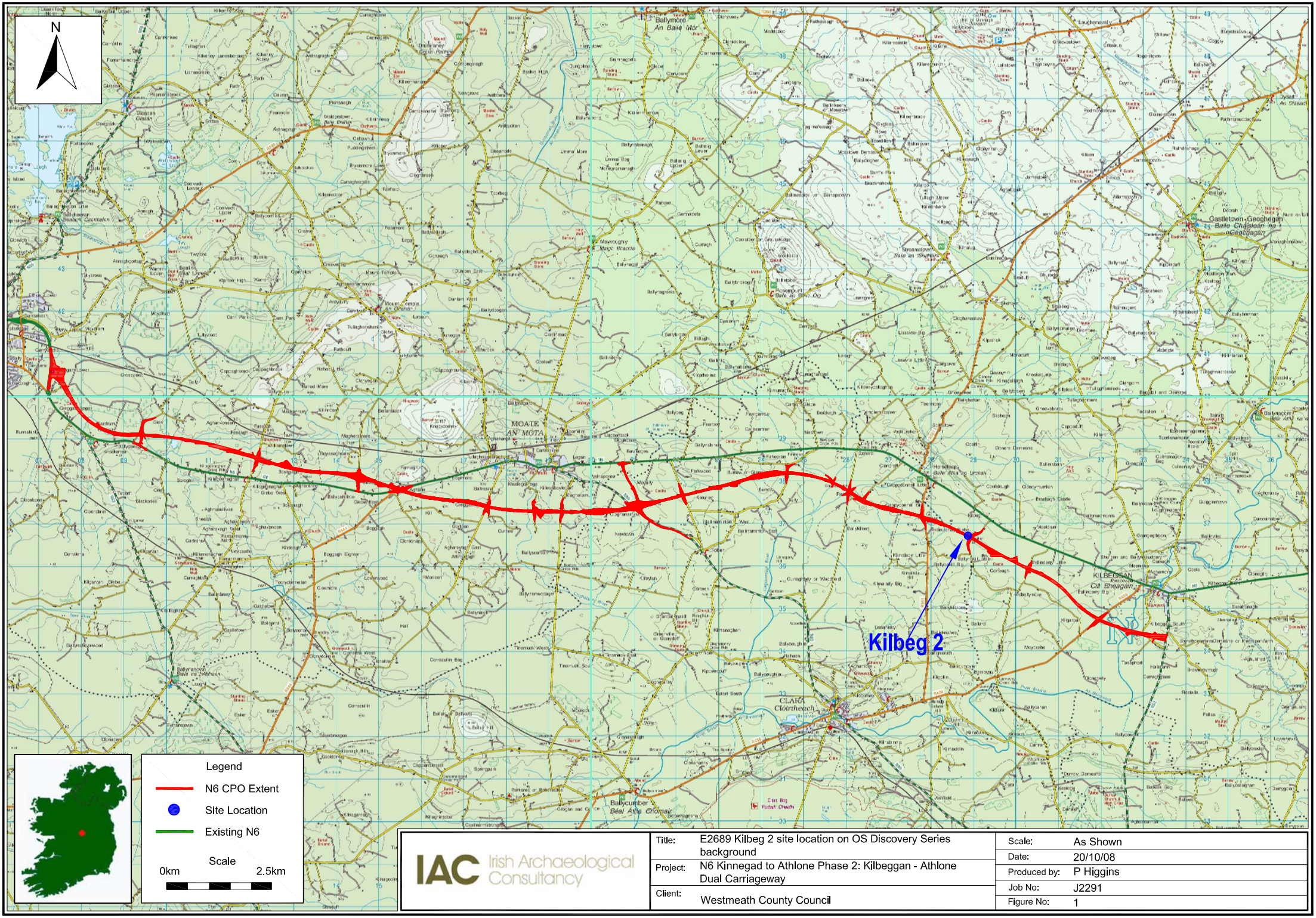
RMP No	Description
WM037-001	Ringfort (Rath/Cashel)
WM037-002	Castle
WM037-004	Ringfort (Rath/Cashel)
WM037-005	Ringfort (Rath/Cashel)
WM037-006	Ringfort (Rath/Cashel)
WM037-007	Castle
OF002-021	Ringfort
OF002-022	Earthwork Site
OF002-023	Ringfort (Rath/Cashel)
OF002-032	Ringfort (Rath/Cashel)
OF002-033	Ringfort (Rath/Cashel)

See Figure 2 for location.

APPENDIX 4 LIST OF N6 SCHEME SITE NAMES

Site Name	Ministerial Direction No.	NMS Registration Number
Seeoge 2	A016/007	E2635
Moyally 7	A016/015	E2643
Kilcurley 1	A016/019	E2647
Cappydonnell Big 1	A016/025	E2653
Ardballymore 2	A016/028	E2656
Creggan lower 1	A016/030	E2658
Creggan lower 2	A016/031	E2659
Williamstown 1	A016/032	E2660
Williamstown 3	A016/033	E2661
Williamstown 4	A016/034	E2662
Boyanaghcalry 1	A016/035	E2663
Seeoge 1	A016/036	E2664
Aghafin 1	A016/037	E2665
Cregganmacar 1	A016/038	E2666
Cregganmacar 2	A016/039	E2667
Cregganmacar 3	A016/040	E2668
Curries 1	A016/041	E2669
Curries 2	A016/042	E2670
Culleenagower 1	A016/043	E2671
Moyally 2	A016/044	E2672
Moyally 1	A016/046	E3274
Moyally 3	A016/047	E2674
Moyally 5	A016/048	E2675
Moyally 6	A016/049	E2676
Tober 1	A016/051	E2677
Burrow or Glennanummer 1	A016/052	E2678
Burrow or Glennanummer 2	A016/053	E2679
Burrow or Glennanummer 3	A016/054	E2680
Russagh 4	A016/055	E2681
Russagh 1	A016/056	E2682
Russagh 2	A016/057	E2683
Russagh 3	A016/058	E2684
Kilbeg 1	A016/059	E2688
Kilbeg 2	A016/060	E2689
Kilbeg 4	A016/062	E2691
Kilbeg 5	A016/063	E2692
Kilbeg 6	A016/064	E2693
Kilbeg 7	A016/065	E2694
Correagh 1	A016/066	E3374
Ballinderry Little 1	A016/067	E2695
Ardballymore 1	A016/068	E2696
Kilgaroan 1	A016/069	E2697
Kilgaroan 2	A016/070	E2698
Kilgaroan 3	A016/071	E2699
Kilgaroan 4	A016/072	E2700
Kilgaroan 6	A016/074	E2702
Ballinderry Big 1	A016/076	E3275
Ballinderry Big 2	A016/077	E3276
Ballinderry Big 3	A016/078	E3277
Tonaphort 1	A016/079	E3278
Tonaphort 2	A016/080	E3279
Tonaphort 3	A016/081	E3280

Site Name	Ministerial Direction No.	NMS Registration Number
Kilbeggan South 1	A016/082	E3281
Kilbeggan South 2	A016/083	E3282
Kilbeggan South 3	A016/084	E3283
Cregganmacar 4	A016/085	E2703
Williamstown 2	A016/086	E2704
Kilbeg 8	A016/087	E3966



IAC Irish Archaeological Consultancy

Title:	E2689 Kilbeg 2 site location on OS Discovery Series background
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	As Shown
Date:	20/10/08
Produced by:	P Higgins
Job No:	J2291
Figure No:	1

N

WM037-001

WM037-002

WM037-004

WM037-005

WM037-006

WM037-007

OF002-021
DE-LISTED

Cappydonnell Big 1

Burnt mound
Kilbeg 1

Burnt mound
Kilbeg 2

Burnt mound
Kilbeg 4

Burnt mound
Kilbeg 5

Burnt mound
Kilbeg 6

Kilbeg 8

Burnt mound
Kilbeg 7

Burnt mound
Correagh 1

Ballinderry Little 1

Ardballymore 2

Ardballymore 1

Kilgaroan 2

Kilgaroan 3

Kilgaroan 1

Kilgaroan 4

OF002-022

OF002-023

OF002-031
DE-LISTED

OF002-032

OF002-033

KILBEG

CLOONYMURRIKIN

BRACKAGH CASTLE

MEELDRUM

BALLYNAKILL BIG
Baile na Coille Mór

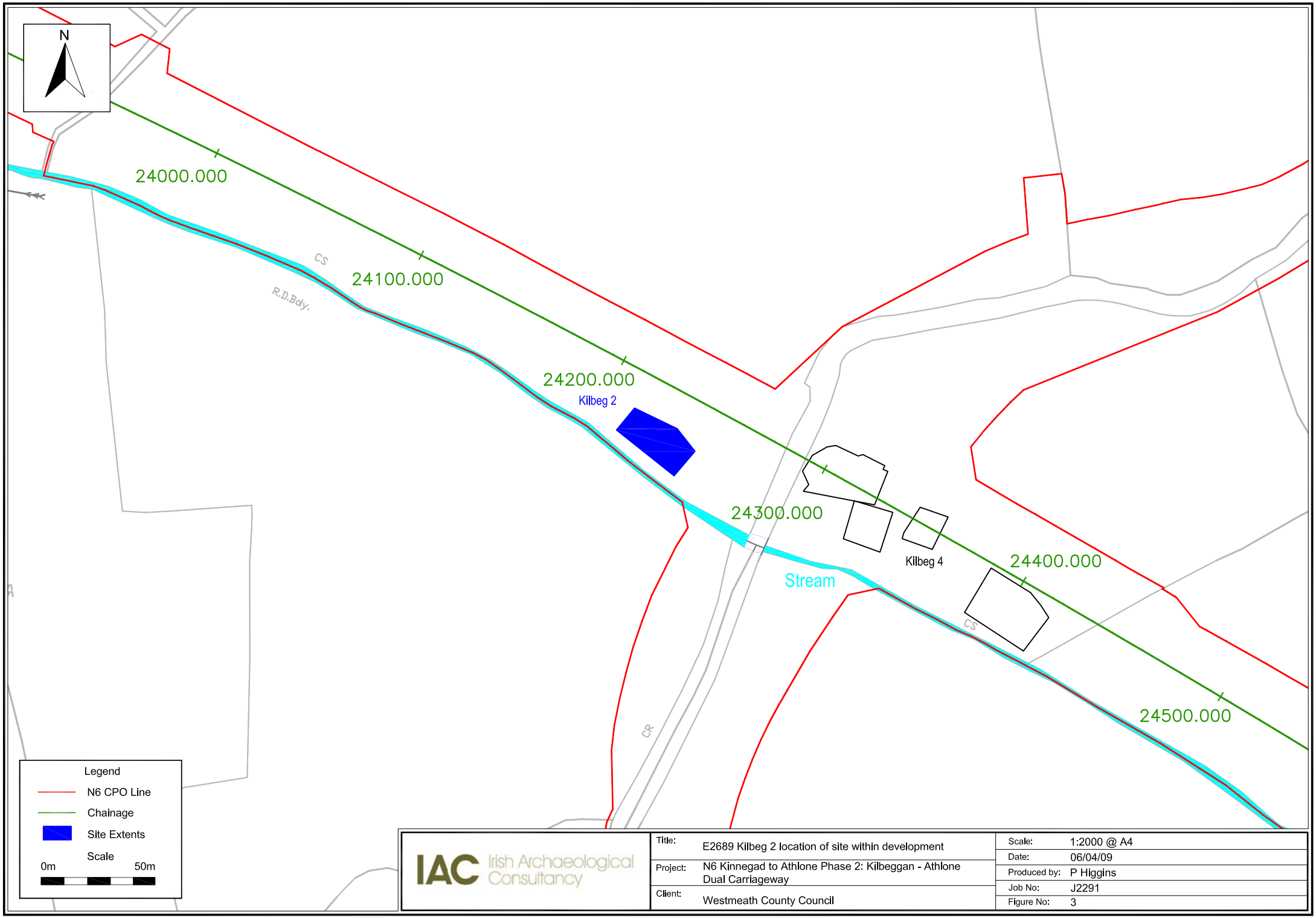
BALLYNAKILL LITTLE
Baile na Coille Beag

CORREAGH

Legend
N6 CPO Line
RMPs
Scale
0m 250m

Title:	E2689 Kilbeg 2 showing RMPs with OS background		
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway		
Client:	Westmeath County Council		
Scale:	1:10000 @ A3	Job No:	J2291
Date:	06/04/09	Figure No:	2
Produced by:	P Higgins		

IAC Irish Archaeological Consultancy



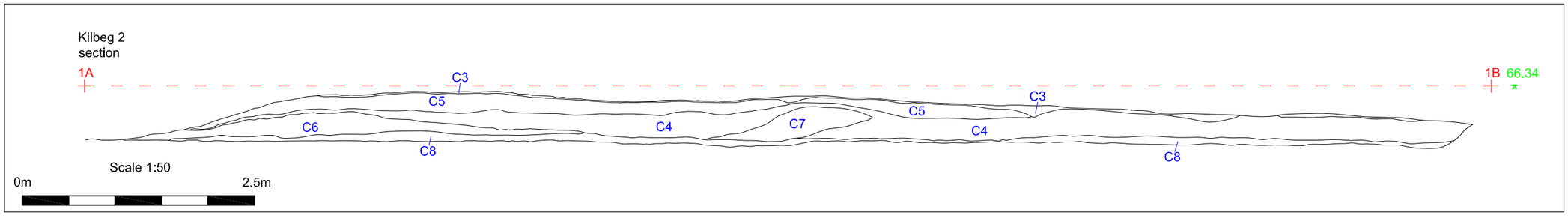
IAC Irish Archaeological Consultancy

Title:	E2689 Kilbeg 2 location of site within development
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:2000 @ A4
Date:	06/04/09
Produced by:	P Higgins
Job No:	J2291
Figure No:	3

N

Kilbeg 2
section



Scale 1:50

0m 2.5m

228865E
236711N

65.65

1A

limit of excavation

limit of burnt mound

66.10

stream

228865E
236697N

228876E
236697N

1B

Field drain

Scale 1:100

0m 5m

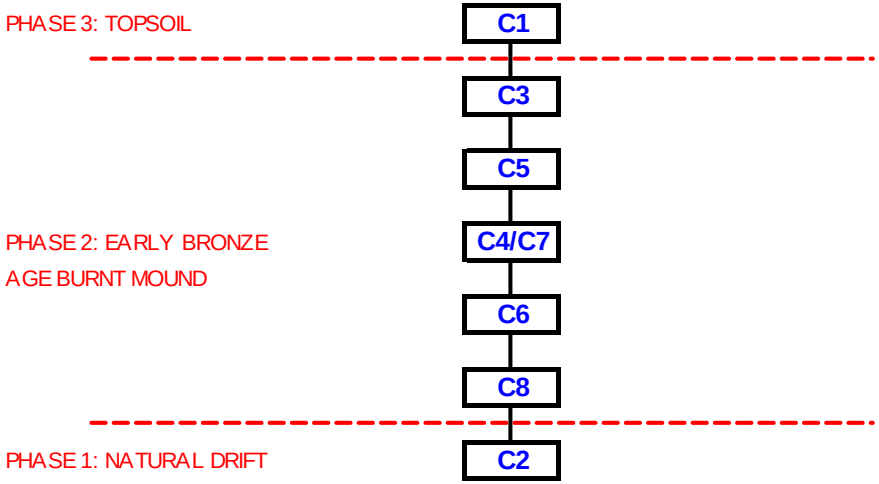
Legend

- Break of slope
- Sections
- Limit of Excavation
- C## Cut numbers
- Stone
- 0.00 Levels

level of the stream (65.26m OD)
4th April 2006

65.60

Title:	E2689 Kilbeg 2 plan and section of site	
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway	
Client:	Westmeath County Council	
Scale: as shown @ A3	Job No: J2291	IAC Irish Archaeological Consultancy
Date: 06/04/09	Figure No: 4	
Produced by: G Kearney		



CXXX = SPREADS AND FILL CONTEXTS
CXXX = CUT CONTEXTS

IAC Irish Archaeological Consultancy	Title:	E2689 Kilbeg 2 matrix	Scale: N/A
	Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway	Date: 23/04/09
	Client:	Westmeath County Council	Produced by: G Kearney
			Job No: J2291
			Figure No: 5