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

SITE A016/055; E2681: RUSSAGH 4

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.	A016/055
NMS Registration Number	E2681
Excavation Director	Ellen O'Carroll
Senior Archaeologist	Shane Delaney
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Westmeath County Council
Site Name	Russagh 4
Site Type	Charcoal Production Kilns
Townland	Russagh
Parish	Horseleap or Ardnurcher
County	Offaly
NGR (Easting)	E225858 (A) E225863 (B) E225891 (C)
NGR (Northing)	N237910 (A) N237891 (B) N237875 (C)
Chainage	20940–21010
Height m OD	55m OD
RMP No.	N/A
Excavation Start Date	22 February 2006
Excavation Duration	7 Days
Report Type	Final
Report Date	15 July 2009
Report By	Ellen O'Carroll

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.

CONSULTING ENGINEERS

Project Manager – Harry Meighan, ROD/RH WSP JV
Project Engineer – Morgan Hart, ROD/RH WSP JV
Project Resident Engineer – Michael Brazil, ROD/RH WSP JV
Resident Engineer – Cliff Webb, ROD/RH WSP JV

NRDO WESTMEATH COUNTY COUNCIL

Senior Engineer – John Ahern
Project Engineer – Michael Kelly
Project Liaison officer – Niall Kennedy

NATIONAL ROADS AUTHORITY

Engineering Inspector – John McGuinness
Senior Project Archaeologist – Ronan Swan
Project Archaeologist – Orlaith Egan

NATIONAL MONUMENTS, DOEHLG

Archaeologist – Martin Reid

IRISH ANTIQUITIES DIVISION, NATIONAL MUSEUM OF IRELAND

REPORT PRODUCTION
Report Formatting and Editing – Joanne O'Meadhra Elder, Maeve Tobin, Shane Delaney and Fintan Walsh
Report Research – Jonathan Kinsella and Eimear O'Connor

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 Russagh at the site of Russagh 4 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 Ellen O'Carroll under Ministerial Direction (A016/055) and NMS Registration Number E2681 issued by the DOEHLG in consultation with the National Museum of Ireland. The fieldwork took place between 22 February and 2 March 2006.

The excavation at Russagh 4 covered three areas, each 10m by 10m, totalling approximately 300 sqm. Excavation at Area A revealed two palaeochannels or silted up stream beds. Two pits (one of which was a possible charcoal production kiln), a hearth and an area of burning were positioned along the edge of the channels. A single charred grain identified as wheat/bread grain was recovered from one of the pits (Lyons, Appendix 2.4).

Area B consisted of the remains of two charcoal production kilns, one rectangular and the other circular. The rectangular kiln contained two fills; the primary fill was charcoal rich and there was evidence of *in-situ* burning around the base. AMS dating of this feature produced a calibrated 2 Sigma date of AD 994–1153 dating it to the early medieval period (QUB, Appendix 2.6). The circular charcoal production kiln also contained large quantities of charcoal and evidence of *in-situ* burning. AMS dating of this feature returned a date of AD 1042–1211 also dating it to the early medieval period (QUB, Appendix 2.6). The similarity of fills, the large quantities of oak and proximity to one another suggested the two features were related, both presumably used in the production of charcoal.

Area C contained three features all of which were non-archaeological.

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1 INTRODUCTION

1.1 General

This archaeological report describes the final results of the excavation carried out at the site of Russagh 4 in the townland of Russagh, Co. Offaly (Figures 1 and 2), as part of an archaeological mitigation programme associated with the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme. Archaeological fieldwork was carried out under ministerial direction by Ellen O'Carroll for Irish Archaeological Consultancy Ltd (IAC Ltd) and was funded by Westmeath County Council and the National Roads Authority under the National Development Plan 2000–2006, 2007–2013 and the EU Structural fund.

Russagh 4 was identified during a test trenching programme undertaken by IAC Ltd in August 2005 (Ministerial Direction No A016/029; NMS Registration No. E3273). All features identified during the assessment phase (a possible hearth (Area A), 2 pits (Area B) and a linear feature (Area C)) were subsequently re-identified and the site was fully excavated between 22 February and 2 March 2006 with a team of 1 director, 1 supervisor and a maximum of 9 site assistants.

The site was located on sloping pastureland within the area defined as Gageborough House Demesne, at a height of 55m OD, to the south of the existing N6 and c. 5km north of Clara town (Offaly OS sheet 02). The excavation covered 3 areas each approximately 10m by 10m totalling approximately 300sqm. Russagh 4 had not been previously known and was not a Recorded Monument.

The site was assigned the following identification data:

Site Name: Russagh 4; Ministerial Direction No.: A016/055; NMS Registration No.: E2681; Route Chainage (Ch): 20940–21010; NGR: 225858/237910 (Area A), 225863/237891 (Area B) and 225891/237875 (Area C).

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 0.3km 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 were 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 subsoil 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 using 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 fully excavated by hand and recorded using the single context recording system with plans and sections 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

The site was divided into three areas for the purpose of excavation. All three measured 10m by 10m. Detailed descriptions of contexts are given in Appendix 1. The site matrix is detailed in Figure 8.

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 C3, above bedrock, encountered at Russagh 4 was uniform across the site and consisted of mottled grey/brown silty clay with patches of iron panning & pockets of grey sand.

2.2 Phase 2: Early Medieval Activity

The features identified in Areas A and B were similar in typology and although no features in Area A were dated it is likely that they are contemporary with those in Area B by association. The features identified in Area C were found to be non-archaeological.

2.2.1 Area A

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
6	C30	1.01	0.72	0.26	Grey/brown mottled marly clay with charcoal	Natural sedimentation
7	C29	1.45	0.7	0.08	Grey/ brown/ black silty charcoal-rich clay	Charcoal deposit
8	C22	0.45	0.85	0.08	Black/brown silty clay with charcoal	Upper fill of C22
9	C22	0.42	0.4	0.06	Firm / hard compaction of red burnt clay	Oxidised subsoil
22	N/A	0.85	0.45	0.41	Sub-circular cut with concave base	Cut of hearth
29	N/A	1.45	0.7	0.08	Sub-rectangular cut, with concave base	Charcoal prod. kiln
30	N/A	1.01	0.72	0.26	Sub-rectangular cut with concave base	Cut of pit
31	N/A	0.4	0.3	0.03	Irregular spread black & red charcoal & clay	Burnt spread

Finds: None

Interpretation:
Four archaeological features (C22, C29, C30 and C31) were identified in Area A (Figure 4). A layer of burnt clay (C9) was recorded at the base of (C22) indicating *in-situ* burning. It was sealed by C8 (Figure 5; Plate 2). This feature may have been a small hearth. A single charred wheat grain and fragments of other unidentified grains were recovered from C8 (Lyons, Appendix 2.4). The grain recovered from the hearth may have been intrusive and an indication of the surrounding environment at the time.

Pit C29 was wide and shallow and filled by C7, a charcoal deposit. This was cut by circular pit C30 which was filled with a light brown clay (Figures 4 and 5; Plate 3). C31 was a small area of *in-situ* burning.

The high content of charcoal in C29 and the evidence for *in-situ* burning within the pits suggests that this may have been a charcoal production kiln.

These features have been interpreted as early medieval in date due to similarities with features in area B which have returned radiocarbon dates from this period.

2.2.2 Area B

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
17	C19	0.91	1.4	0.16	Light grey clay, no inclusions	Secondary fill of C19
18	C20	1.1	1.16	0.08	Dark grey clay, no inclusions	Secondary fill of C20
19	N/A	0.91	1.4	0.08	Rectangular cut, steep sides, concave base	Charcoal prod. kiln
20	N/A	1.1	1.16	0.13	Circular cut, gradual sides, concave base	Charcoal prod. kiln
23	C20	1.1	1.16	0.05	Loose charcoal layer	Burnt layer in C20
24	C19	0.91	1.4	0.05	Loose layer of charcoal	Burnt layer in C19

Finds: None

Interpretation:
The archaeology in Area B comprised two features (Figure 6). The first (C19) was a sub-rectangular charcoal production kiln with *in situ* burning around the edges. This contained two fills, the lower (C24) was a charcoal deposit (Figure 7; Plates 5 and 6). The second feature (C20) was a circular charcoal production kiln which also had evidence of *in-situ* burning around its base (Figure 7; Plate 4).

Charcoal from C24, basal fill of C19, was identified as oak and was dated to 983 +/- 27 BP (UBA 9157, Appendix 2.6). The 2 Sigma calibrated result of AD 994–1153 places it in the early medieval period. Charcoal from C23, the primary fill of C20 was identified as oak bark (*Quercus* sp.) (O'Carroll - Appendix 2.5) and was sent for AMS dating. This sample returned a date of 898 +/- 24 BP (UBA 9158, Appendix 2.6). The 2 Sigma calibrated result from this sample produced a date of AD 1042–1211. This suggests a broad contemporary activity between the two features.

2.2.3 Area C

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
16	C21	1.52	0.50	0.40	Yellow silty marly clay, occasional charcoal	Fill of C21
21	N/A	1.52	0.50	0.40	Rectangular cut with vertical sides	Tree bole
25	N/A	1.25	1.24	0.07	Spread of grey/yellow silty clay with charcoal	Spread
27	C28	0.80	0.69	0.15	Firm grey silty clay, no inclusions	Fill of C28
28	N/A	0.80	0.69	0.15	Rectangular cut, steep sides, concave base	Tree bole

Finds: None

Interpretation:
The shallow charcoal-rich spread C25 appears to have been a burnt root. C21 and C28 were irregular shaped features that may have been tree boles that had burnt in the past. None of the features in Area C were considered to be archaeological in nature.

2.3 Phase 3: Post-Medieval Activity

2.3.1 Watercourses

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
4	C5	9.00	3.00	0.20	Orange-mid brown sandy silt, round stones	Stream deposit
5	N/A	9.00	3.00	0.20	Linear, sloping/undulating, concave base	Stream bed
10	N/A	7.50	1.55	0.23	Linear cut, gentle sides, concave base	Possible river channel
11	C10	7.50	1.55	0.23	Mid brown silty clay, large rounded stones	Stream deposit

Finds:

Context	Find Number	Material	Period	Description
4	E2681:4:1	Metal	Unknown	Cu alloy pin fragment
4	E2681:4:2	Pottery	Post-medieval	Clay pipe fragments
4	E2681:4:3	Pottery	Modern	19th/20thC pearlware plate sherd
4	E2681:4:4	Pottery	Modern	19th/20thC pearlware plate chip
4	E2681:4:5	Metal	Post-medieval	Iron Object
4	E2681:4:6	Glass	Post-medieval	Post-medieval green glass bottle sherd
4	E2681:4:7	Pottery	Medieval	13thC Dublin type ware green glaze
11	E2681:11:1	Metal	Post-medieval	Iron Object

Interpretation:
Two former stream channels were identified crossing Area A. One channel, C10, ran across the site in a northeast–southwest direction while the other, C5, ran from the eastern edge of the site into C10 near its southern end (Figure 4 and 5). A number of post medieval artefacts (E2681:4:1, E2681:4:7 and E2681:11:1) were recovered from the silt like fill of these channels suggesting that the channels silted up or were diverted and backfilled during this period (McCutcheon, Appendix 2.2; Johnston, Appendix 2.3).

2.3.2 Agricultural Activity

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
12	N/A	7.50	0.48	0.13	Linear cut, steep sides, concave base	Plough furrow
13	C12	7.50	0.48	0.13	Mid orangey brown fine sandy silt	Furrow fill
34	C35	1.65	0.23	0.13	Mid brown silty clay	Furrow fill
35	N/A	1.65	0.23	0.13	Linear cut, steep sides, concave base	Plough furrow

Finds:

Context	Find Number	Material	Period	Description
12	E2681:12:1	Chert	Mesolithic/Neolithic	Early Mesolithic to Neolithic blade

Interpretation:
This group represents the remains of features interpreted as being related to modern agricultural activity on the site consisting of plough furrows.

A chert blade (Plate 7) was recovered from the fill of furrow C12 indicating an archaeological presence from a much earlier date in the area sometime between the early Mesolithic and Neolithic periods (Sternke, Appendix 2.1).

2.4 Phase 4: Topsoil

2.4.1 Topsoil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
1	N/A	Site	Site	Site	Sod layer	Sod
2	N/A	Site	Site	Site	Mid brown friable silty clay	Topsoil

Finds: None

Interpretation:
Phase 4 represents the topsoil that sealed all of the archaeological deposits and features at Russagh 1.

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 Russagh 4 was located at the base of a hill (55m OD), in pasture land which sloped to the north. The underlying geology of the area is carboniferous limestone, which is overlain with occasional small glacial hillocks, forming a gently undulating low-lying landscape. Soil cover in this area consists of regosols, which would have been subject to occasional flooding. The site was situated between two streams, 150m to the southeast and 200m to the northeast, which are sources of the Gageborough River. Two silted stream beds were investigated during the excavations. Two bogs are located within the vicinity, Dunard/Newtown 375m to the north and Ballykilleen bog 1.1km south of the site. Gageborough House was situated 600m to the east.

3.2 Archaeological Landscape (Early Medieval)

From east to west the N6 passes in proximity to the towns of Kilbeggan, Clara, Moate and Athlone. This stretch of landscape corresponds with a probable medieval routeway leading from the secular hub of Kilbeggan to that of Athlone, which is thought by some to represent the *Slighe Mhór* (O Lochlainn 1940, 471).

Kilbeggan, or *Cill Bheagáin*, derives its name from St Beccan who was associated with the town in the sixth century AD (McCormack 2006, 5). The site of St Beccan's monastery occupies the vicinity of the current graveyard and Protestant Church in the town. A later monastery was constructed by the Cistercians, close to Saint Beccan's site, in AD 1150 (Masterson 2004). Both of these monastic foundations lay in proximity to the River Brosna and it is likely that the town developed from this point. A number of recorded RMP sites testify to early medieval monastic activity in Kilbeggan and include an ecclesiastical site (WM038-017001), graveyard (WM038-017002) and church (WM038-017006). A recent geophysical survey has identified the footprint of the Cistercian monastery and excavations nearby have revealed a large cemetery (possibly of early medieval date) a cereal-drying kiln, pits and ditches (Hayden 2003; Sweetman 2004). A significant excavation, c. 5km to the north of Kilbeggan, at Gneevebeg uncovered an enclosed cemetery of probable early medieval date in addition to cereal-drying kilns, a bullaun stone and a number of pits and ditches (Wallace 2002).

The north midlands, through which the N6 traverses, is described by Stout (1997, 77) as having a high-density of ringforts and enclosures. A number of enclosure sites (OF008-006) and possible enclosures (OF008-005 & OF008-014) are recorded within the small town of Clara, Co. Offaly; some of which may represent early medieval ringforts. Excavations at Ballicknahee, near Clara, revealed at least 17 extended inhumation burials of possible early medieval date (Murphy 1998). Excavations at Cappydonnell Big (Coughlan 2009a) have revealed a large multi-period enclosure located in proximity to several ringforts at Ballynakill Big (OF002-

023, OF002-032 & OF002-033) to the south and at Kilbeg (WM037-001 & WM037-004) to the east.

An early medieval enclosure was excavated at Moyally 1 (Bayley 2009a) 400m south of a ringfort (WM030-115) and near two enclosures (WM030-114 and OF001-005), indicating a continuance of settlement and activity c. 2km southeast of Moate. The nearest recorded early medieval monument at Moate, Co. Westmeath is a ringfort to the west at Tullaghnageeragh (WM030-108), however the sites in closest proximity are castles dating to the later medieval period. As Moate develops into a settlement of status in the later medieval period it is thought that there must have been a preceding focus of activity here during the early medieval of possible ecclesiastic origin due to the presence of a bullaun stone (WM030-117) and burial ground (WM030-113).

The largest of the towns along the N6, Athlone, is situated on the banks of the River Shannon in Co. Westmeath. By the ninth century AD the territory to the immediate west of Athlone was occupied by the *Delbna Nuadat* and the region to the east was inhabited by a vassal tribe of the southern *Uí Néill* called the *Bregmine* who gave title to the barony of Brawny (Murtagh 2000, 9). Archaeological evidence in the form of five decorated grave slabs, dating between the middle eighth to tenth centuries, indicates that an unrecorded ecclesiastical site was situated in Athlone at this time (Murtagh 2000, 11). Athlone is associated with a battle in AD 894 between the Connachtmen and the men of Meath meanwhile Lough Ree, to the north, was repeatedly the focus of Viking activity between AD 922 and 937 (*ibid*.). Little is known about the development of Athlone west of the Shannon but the surviving castle, probably constructed in the 13th century, was possibly built on the site where the castle of the *Uí Conchobhair* stood in the early 12th century (Sullivan 1997); of which the precise location is unknown (Murtagh 2000, 13). Recent excavations in Athlone have failed to locate any trace of early medieval activity; instead they have revealed later activity dating mainly to the late middle ages and post medieval period.

The Hill of *Uisneach* located c. 14km to the NNW of Kilbeggan is often referred to as a central axis point or place of assembly of high importance, due to its location in *Mide* (Schot 2006, 41). During the early medieval period it was thought to hold contemporary significance with Tara and many mythological and annalistic tales refer to the area as one of territorial and spiritual consequence. Reanalysis of the excavations undertaken by MacAlister and Praeger in the 1920s at Rathnew, a figure of eight shaped enclosure at the Hill of *Uisneach*, has highlighted activity during the late Iron Age and early medieval period. It has been suggested that the conjoined bivallate ringfort with associated structures and souterrain may have functioned as a royal seat of the *Clann Cholmáin* further adding to the political and religious significance of this landscape (ibid 65).

Crannógs also feature significantly in this region and include those excavated by Hugh Hencken during the 1920s at Ballinderry I, Co. Westmeath (Hencken 1936) and Ballinderry II, Co. Offaly (Hencken 1942), located c. 2km north east and ENE respectively from Moate. Recently, the excavated evidence from both crannógs has been reinterpreted by Ruth Johnson (1999) at Ballinderry I and Conor Newman (2002) at Ballinderry II. These crannógs are centrally located in relation to many important early medieval ecclesiastical centres, such as Clonmacnoise, Gallen, Bealin, Durrow, Rahan and Inchbofin (Johnson 1999, 24).

Ballinderry I, located in the barony of Clonlonan, has been interpreted as a high status early medieval site with evidence for craft working, agriculture, trade, hunting or warfare and domestic and leisure activities (Johnson 1999). The tenth century

Ballinderry game-board is thought to be the most striking piece of decorated wood of this period found outside Dublin and certainly adds to the significance of the settlement. The artefactual evidence for Hiberno-Scandinavian influence at Ballinderry I is strong and it has been suggested that this may be associated with a rise in the military and economic strength of the *Clann Cholmáin* in the region (Johnson 1999, 67). Newman's reassessment of the early medieval activity at Ballinderry II, located in the barony of Kilcoursey, revealed evidence for high status deer hunting, killing and feasting (Newman 2002). The abundance of deer bone and antler in the faunal assemblage and presence of c. 11 circular wicker structures are associated with numerous high quality artefacts dating to the sixth and seventh centuries. Artefacts including pins with zoomorphic design, sherds of E ware and gaming pieces indicate possible trade with northern Europe (Newman 2002, 111).

A more recent excavation of a crannóg was undertaken at Newtownlow, in the barony of Moycashel a short distance to the northeast of Kilbeggan (Bourke 1984, 1985). At Coolure, on Lough Derravaragh also within the barony of Moycashel, a crannóg was the focus of a recent archaeological survey, environmental investigation and artefactual and landscape research (O'Sullivan *et al* 2007). Historically, the impact of the Vikings in the region and specifically on Lough Ree is well summarised by Alfred Smyth (1979, 246–53). Ballaghkeeran Little, in the barony of Clonlonan, has been suggested as the location of a possible *longphort* site (Fanning 1983).

Excavations of ecclesiastical sites are rare in the archaeological record but a monastic enclosure was partially excavated at Clonfad, Co. Westmeath (Stevens 2006, 8–11). The findings revealed that a variety of industrial and craft activities occurred on the site including extensive evidence for ironworking and non-ferrous metalworking, notably the production of handbells, and bone working. Another ecclesiastical site excavated at Kilpatrick, located in the most northern barony of Westmeath in Fore, also revealed evidence for bone, antler and ironworking (Swan 1976, 89–96; 1994/95, 1–21).

Russagh 4

Russagh is located west of the centre of the parish of Ardnurcher/Horseleap within the barony of Kilcoursey, County Offaly. Kilcoursey is the smallest barony in Offaly and the only one in the county to be impacted upon by the N6. Russagh is known in Irish as *Ros Each*, meaning 'wood of the horses'. It is also referred to as 'Roskath' in the Down Survey of 1654. The townland consists of c. 363 acres and is bisected by the Gageborough River. Gageborough demesne (CHS 81) is situated in the east of the townland and consists of Gageborough house and its associated demesne features which include a courtyard approached through a large stone arch, demesne walls, ruined outbuildings and the remains of mature parklands. The house is thought to date to the 18th century (Riada Consult, 2003).

There is only one previously recorded archaeological site in the townland of Russagh, which is an enclosure located c. 1km northeast of Russagh 4 (OF002-012). Research undertaken to study the regional distribution of ringforts in the barony of Kilcoursey, Co. Offaly has revealed a high density of ringforts in the area with 0.41 per km squared (Stout 1998, 33).

A number of archaeological features were excavated at Russagh 4 including a possible charcoal kilns or clamps, hearths and charcoal spreads. The possible kiln C19 was a small rectangular-shaped feature with rounded corners that measured 0.91m x 1.40m x 0.08m. The primary fill was charcoal-rich and there was evidence for *in-situ* burning. A 2 Sigma calibrated date of AD 994–1153 (UBA 9157, Appendix 2.6) was obtained from a fragment of oak charcoal from a burnt layer lining.

A number of definite kilns of this type have been uncovered along the N6 Kilbeggan to Athlone road scheme. A large rectangular charcoal production kiln (C12) at Kilbeggan South 3 (Coughlan 2009b), measuring 2.97m x 1.85m x 0.3m (length x width x depth), displayed evidence for a heat-scorched base and sides and its primary fill contained charcoal-rich material with a number of large well preserved pieces of carbonised wood. A sample of charcoal (elm) from this fill returned a 2 Sigma date of AD 1157–1251. The upper fill contained mixed clays and this possibly represents the collapse of the superstructure after the kiln had gone out of use. An even larger oval-shaped charcoal production kiln from the same site (C19), 3.3m x 1.96m x 0.05m also produced a charcoal-rich primary fill with large well preserved pieces of carbonised wood and evidence for intense *in-situ* burning (*ibid*.). A similar date of AD 1052–1217 (2 Sigma) was obtained from charcoal (young oak) within the primary fill. At Ballinderry Big 3, a large rectangular-shaped charcoal production kiln (C12), 2.78m x 1.14m x 0.18m, displayed evidence for a scorched base and its primary fill consisted of over 50% charcoal inclusions (Lynch 2009). Charcoal (oak branch) from this fill returned a 2 Sigma date of AD 896–1014. Another, as yet undated, large oval example (C26), measuring 3.6m x 1.8m x 0.82m, was excavated at Culleenagower 1 (Whitty 2009). Smaller examples were also utilised such as the circular kiln at Kilgaroan 1 (C7), 1.2m x 1.5m x 0.25m, which had oxidised edges and frequent charcoal lump inclusions in both its primary and upper fills (Bayley 2009b). This charcoal production kiln was dated between the middle sixteenth and middle seventeenth centuries.

Other examples found along the scheme include two large sub-rectangular charcoal production pits at Monganstown 1 – on Section 1 between Kinnegad and Tyrellspass – which returned radiocarbon dates between the late ninth and early eleventh centuries (Lehane and Johnston 2007) and at Stonehousefarm 3 – Section 2 between Tyrellspass and Kilbeggan – that included oval and rectangular types. The primary fill of the latter was charcoal-rich and included large pieces of charred wood (McDermott 2004).

The charcoal production kilns at Russagh 4 are similar to a number of features along the N6 that are recorded as rectangular or oval with heat-scorched sides and bases and moderate to high amounts of charcoal within their fills. Examples include C13 at Ballinderry Big 3 that was dated to AD 779–940 (Lynch 2009), a rectangular example at Tonaphort 3, returned a 2 Sigma date range of AD 777–970 (Coughlan 2009c). Finally, two features (C6 & C11) that were intensively heat-scorched and contained high levels of charcoal were excavated at Kilbeggan South 1 (Coughlan 2009d). The former returned a 2 Sigma date of AD 877–984 while the latter was dated between the middle 11th and early 13th centuries. It is likely that these features represent charcoal production kilns even though some only contained moderate amounts of charcoal. The positive identification of previous examples, such as Hardwood 3, Co. Meath (Carlin *et al* 2008, 101), was due to the survival of charred wood and this is also true of certain kilns on the N6 including those at Kilbeggan South 3. However, this was the result of the kilns' abandonment, possibly due to the charcoal becoming wet and therefore useless, whereas the charcoal from successful kilns would have been retrieved leaving only the heat-scorched pit, low levels of charcoal, and various soil, including clay, inclusions that survive in the archaeological record today.

It appears that the majority of charcoal production kilns date to the latter part of the early medieval period into the early part of the later Middle Ages and the findings on the N6 broadly mirror the findings from other dated kilns (Carlin *et al* 2008; Kenny 2007). It is also apparent that these industrial features were located a safe distance away from settlement sites and in areas close to the required natural resources such as wood and bogland.

3.3 Archaeological Typology Background: (Charcoal Production Kilns)

Charcoal production kilns were essential to the ironworking process as charcoal was produced as a fuel in the smelting and forging stages. Very little was know about archaeological charcoal production before 20 years ago (Tylecote 1986, 225) and this has changed little since (O'Sullivan and Harney 2008, 198). However, there has been an ever increasing discovery of such sites during the boom in development-led archaeology and excavations of charcoal production kilns are beginning to feature in recent publications (Carlin *et al* 2008; Grogan *et al* 2007; Hull and Taylor 2006).

An unpublished paper by Niall Kenny (2008) has identified approximately 100 charcoal production kilns in Ireland that range in plan from rectangular, oval and circular, with sub-variations of these, and there is an approximate equal amount of each type. It appears, on current evidence, that the classic type are large and rectangular in plan such as Hardwood 3, Co. Meath for example, where long carbonised pieces of oak were found along the axis of the kiln that made up almost 100% of the deposit (Carlin *et al* 2008, 101; Illus. 5.8b, 102). The rectangular kilns tend to be larger than oval and circular types with an average length of 2.5m but they can also be as long as 4m (Kenny 2008, 14–5). The oval kilns tend to be shallower than the other types while the circular examples are usually smaller but deeper compared to rectangular and oval charcoal production kilns *(ibid.* 15).

Charcoal production kilns are identifiable archaeologically as earth-cut pits, with charcoal-rich fills, and evidence for extensive *in-situ* burning along the base and sides (Carlin *et al* 2008, 101; Kenny 2008, 15). Those discovered along the M4 were rectangular or sub-rectangular in plan (Carlin *et al* 2008), whereas Kenny (2008) has also identified circular and oval types. However, it is important to stress that charcoal production kilns, such as Hardwood 3 and Kilmaniheen West 10 and 12, Co. Kerry (Hull and Taylor 2006, 29–30), were recognisable because the carbonised wood had survived *in-situ* upon excavation. These kilns were abandoned possibly due to the charcoal becoming wet which left it useless as a fuel. Successful kilns would not leave abundant charcoal within their primary fills so would appear archaeologically as heat-scorched pits probably containing only moderate amounts of charcoal. This, therefore, conveys the problems positively identifying charcoal production kilns as many charcoal yields will have been previously removed.

The majority of charcoal production kilns are located away from settlements and close to resources required for the primary ironworking processes such as bog and woodlands. Large quantities of tress were required for charcoal production and, similarly, large quantities of iron ore – available within surrounding bogs (Mytum 1992, 230; Raftery 1994, 147) – were needed during the smelting process. Therefore, it made sense, logistically and for safety reasons, for charcoal production kilns to be situated a distance from dwellings and farms and close to available raw materials. Kenny's (2008, 20–2) research has also shown that the majority of kilns are located on sloping and agriculturally unproductive ground and drainage was probably an important factor because it was imperative to keep the charcoal dry.

Radiocarbon dates are beginning to emerge from a number of charcoal production kilns and possible examples. Of those dated, the majority appear to date to the latter part of the early medieval period. The kilns at Hardwood 3, Rossan 3, Ardnamullan and Newcastle 2, excavated along the M4, returned radiocarbon dates between the eighth and thirteenth centuries (Carlin *et al* 2008, 88). The dates appear to converge at a point between the eleventh and twelfth centuries. Kilns at Kilmaniheen West, Co. Kerry and Barefield, Co. Clare also returned radiocarbon dates spanning the latter part of the early medieval period (Hull and Taylor 2006). A circular kiln at Mondaniel 2, Co. Cork was dated to AD 1420–1640 (Kenny 2008, 18) but, on current evidence,

charcoal production kilns generally date to the latter part of the early medieval period into the early years of the later middle ages. Therefore, it appears that charcoal production was at its most prolific during these years but dating of further features may alter this picture.

Charcoal is the material produced from the incomplete combustion of wood and was used as an effective fuel – much more so than wood or turf for example – during the smelting and forging stages of ironworking. It was produced through the placement of wood – mainly oak – against a vertical post in earth-cut pits that were covered by layers of straw or bracken and were then sealed by a layer of earth or turf. The post was removed and the kiln was subsequently ignited as the wood was roasted to produce the charcoal over a number of days (Carlin *et al* 2008, 89–91). This was a labour intensive process that required careful supervision and plentiful raw materials and the identification of increasing number of charcoal production kilns emphasises that it was a much more widespread industrial activity than previously considered and that it was an essential component of the iron production process.

3.4 Discussion

One main phase of archaeological activity was identified at Russagh 4, early medieval charcoal production kilns. The specific archaeological context of the site and its phases are described in detail below.

3.4.1 Phase 1: Natural Deposits

Phase 1 represents the natural subsoil present across the whole of the excavated area of the site, and consisted of mottled grey/brown silty clay with patches of iron pan and pockets of grey sand. All archaeological features were cut into the natural subsoil.

3.4.2 Phase 2: Early Medieval Activity

Excavation at Area A revealed two silted up stream beds, one that ran southwest to northeast from the northeastern corner of the site and another that ran northwest to southeast into the present stream to the south of the site. Along the edge of the stream channels were three pits and a hearth. A charred grain of bread wheat was recovered from the fill of hearth C22 along with a number of other unidentifiable grains (Lyons, Appendix 2.4).

Area B comprised of two charcoal production kilns or clamps, one sub rectangular (C19) and the other circular. The sub rectangular kiln, although shallow, contained two fills. The primary fill (C24) was charcoal rich and the base of it indicated evidence for *in-situ* burning. The large circular kiln also contained large quantities of charcoal (C20) and signs of *in-situ* burning. As both kilns retained a high charcoal content in their primary fills it is possible that they were not successful kilns and were abandoned (Cf. Section 3.3).

Two samples of charcoal identified as oak and oak bark (*Quercus* sp.) (O' Carroll, Appendix 2.5) were retrieved and sent for AMS dating. A date from C24 of 983+/- 27 BP (UBA 9157) gave a calibrated 2 Sigma date range of AD 994–1153 for the charcoal production kiln while a sample from C23 from nearby pit C20 gave a date of 898 +/- 24 (UBA 9158) which gave a calibrated 2 Sigma date range of AD 1042–1211 (QUB, Appendix 2.6).

The features in areas A and B relate to small scale charcoal production. Given the similarity in activity in the two areas it is likely that they were broadly contemporary. Area C contained three potential features, however upon investigation they proved to be non archaeological in nature.

There were only four taxa identified from the charcoal recovered from the site. Oak was exclusively present in the charcoal rich pit C27, the hearth C23 and the charcoal production kiln C24 which dated to the early medieval period. Oak was also identified from the hearth C22 and the spread C31 and the pit C9 in Area A. Alder was also identified from the hearth C22 in area A and hazel twigs along with elm were identified from the pit C9. It is clear from these results that oak was specifically collected and used at the site in the early medieval period. Oak may also have also been selected for use as kindling for the hearths and fires excavated alongside the stream beds. Elm and hazel, dry land *taxa*, were also present in the landscape as well as alder, a wetland tree.

Oak was the preferred choice of fuel as indicated by the specialist results. Oak wood due to it's high calorific content and it's heat burning properties was suitable for such uses as indicated at similar excavated sites across the country. The Russagh 4 charcoal production kilns are examples of a larger number of this feature type identified during this project. This includes examples at Curries 1 & 2 to the west dated to (AD 989–1148) and further to the east and south of Kilbeggan town at Kilbeggan South 3 examples were excavated dating to AD 1052–1251. At Ballinderry Big 3 (also south of Kilbeggan town) an example dated to AD 779–940 and at Tonaphort 3 another dated to AD 777–970.

As with all charcoal production kilns the positive identification of these features are generally of those that 'failed'. Meaning, that as their function was to produce charcoal for use as fuel in metalworking furnaces or cereal drying kilns, the fact that the charcoal was not removed means that the charcoal was not useful. It is generally believed that the charcoal became wet before the process finished and the remaining charcoal was left within the kiln. To avoid this it was preferable to locate these on well-drained soils or gravels and on the slopes of hills with good drainage.

3.4.3 Phase 3: Post-Medieval Activity

Phase 3 was represented by relic watercourses and plough furrows. Two silted or backfilled stream features crossed the site. A number of post-medieval artefacts recovered form the fill of these channels suggesting that the channels silted up or were diverted and backfilled during this period (McCutcheon, Appendix 2.2; Johnston, Appendix 2.3).

The two furrows represented modern agricultural activity truncating the site. A chert blade (E2681:12:1; Plate 7) recovered from one of the furrows, was identified as to be of early Mesolithic or Neolithic date, and indicates activity from a much earlier date in the vicinity (Sternke, Appendix 2.1).

3.4.4 Phase 4: Topsoil

This phase represents the topsoil that sealed all of the archaeological deposits and features on site.

3 CONCLUSIONS

Russagh 4 was identified during the test trenching programme and based on the results of that three areas were targeted for excavation.

Area A consisted of two silted up stream beds, one orientated northeast–southwest from the northeastern corner of the site and another that ran northwest–southeast into the other stream at the southern end of the site. Along the edge of the stream a possible charcoal production kiln, a hearth and a small area of burning were identified. The Charcoal production kiln was also cut by a later pit. All finds from the fill of the stream channels were medieval or modern. One wheat grain and some indeterminate grain types were identified from the hearth (Lyons, Appendix 2.4)

A chert blade (E2681:12:1) found in the fill of a furrow represents unrelated prehistoric activity on or nearby the site (Sternke, Appendix 2.1).

Two more charcoal production kilns were identified in Area B. One of the kilns was sub-rectangular and although shallow contained a charcoal rich primary fill with signs of *in-situ* burning around the base of the cut. The second, a circular charcoal production kiln, also contained large quantities of charcoal with *in-situ* burning around its edges. The similarity in fills and proximity to one another suggested the two features were related and they returned similar radiocarbon date ranges from the tenth to 13th century (QUB, Appendix 2.6).

Charcoal production kilns are often found associated with metalworking furnaces, which require the charcoal for fuel. The kilns are generally located away from major settlement foci and are instead found close to the source of the raw material (woodland). Oak charcoal is the most common wood species identified in kilns of this type.

Area C contained three features, however upon investigation they proved to be non-archaeological. The finds from Russagh 4 could not be used to date or identify any of the features excavated. The seed analysis returned limited results but has indicated that there was cereal grains available in the during the use period of the kilns.

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PLATES

Plate 1: E2681: Mid-excavation of Area A, facing west

Plate 2: E2681: Section of C22, Area A, facing southeast

Plate 3: E2681: Section of C29 and C30, Area A, facing northeast

Plate 4: E2681: Section of C20 in Area B, facing northwest

Plate 5: E2681: Mid-excavation of C19 in Area B, facing northeast

Plate 6: E2681: Post-excavation of C19 in Area B, facing northeast

Plate 7: E2681: Lithic E2681:12:1

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Finds
1	N/A	Site	Site	Site	Sod	Sod layer.	
2	N/A	Site	Site	Site	Topsoil	Mid brown friable silty clay.	
3	N/A	Site	Site	Site	Subsoil	Mottled grey/brown silty clay, patches of iron panning.	
4	C5	9.0	3.0	0.2	Stream deposit	Moderate compaction of orange - mid brown sandy silt, friable with inclusions of large rounded stones.	Cu Alloy pin, Fe object, Clay pipe fragment, post-med pottery & glass
5	N/A	9.0	3.0	0.2	Water-carved stream cut	Linear, wavy (E–W) orientation, rounded corners, gentle break of slope at top, sloping/undulating sides onto concave base.	
6	C30	1.01	0.72	0.26	Natural sedimentation	Firm compaction of grey/brown mottled marly clay with inclusions of charcoal flecks concentrated at base.	
7	C29	1.45	0.7	0.08	Shallow charcoal deposit	Friable grey / brown / black silty clay with inclusions of charcoal.	
8	C22	0.45	0.85	0.08	Upper fill of C22	Moderate compaction of black/brown friable silty clay with inclusions of charcoal, bone and stone.	
9	C22	0.42	0.4	0.06	Oxidised natural	Firm / hard compaction of red burnt clay, no inclusions.	
10	N/A	7.5	1.55	0.23	Possible river channel	Linear with wavy edges, N–S orientation, rounded corners, sharpish break of slope at top, gentle sloping sides, gentle break of slope at base; concave base.	
11	C10	7.5	1.55	0.23	Stream deposit	Medium compaction of mid - brown silty clay with inclusions of large rounded stones.	Fe object
12	N/A	7.5	0.48	0.13	Plough furrow	Linear, N–S orientation, rounded corners sharp break of slope at top, steep sloping sides, gradual break of slope at base; concave base.	Chert knife
13	C12	7.5	0.48	0.13	Furrow fill	Firm, moist mid orangey brown fine sandy silt, with occasional charcoal fleck inclusions.	
14	C37	0.8	0.32	0.21	Geological deposit/non archaeological	Elongated in plan, moderate compaction of grey / brown silty clay.	
15	C36	0.65	0.5	0.12	Geological deposit/non archaeological	Oval in plan, firm moist mid orange brown fine sandy silt with very occasional charcoal flecks.	
16	C21	1.52	0.5	0.4	Fill of C21	Soft compaction yellow silty marly clay, with occasional charcoal flecks.	
17	C19	0.91	1.4	0.16	Secondary deposit of C19	Soft compaction of light grey clay, no inclusions.	

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Finds
18	C20	1.1	1.16	0.08	Secondary deposit of C20	Firmly compacted dark grey clay, no inclusions.	
19	N/A	0.91	1.4	0.08	Charcoal production kiln	Rectangular in plan with rounded corners, N–S orientation, sharp break of slope at top, steep sloping sides, sharp break of slope at base, slightly concave base.	
20	N/A	1.1	1.16	0.13	Charcoal production kiln	Circular in plan, sharp break of slope at top, gradual sloping sides onto concave base.	
21	N/A	1.52	0.5	0.4	Possible soak pit /tree bole	Rectangular in plan, SE–NW orientation, sharp break of slope at top, vertical sides, sharp break of slope at base.	
22	N/A	0.85	0.45	0.41	Cut of hearth	Sub-circular in plan, sharp break of slope at top to the north, gradual to the south, sloping onto concave base.	
23	C20	1.1	1.16	0.05	Burnt layer in C20	Loose compaction, pure charcoal layer.	
24	C19	0.91	1.4	0.05	Burnt layer in C19	Loose compaction of pure charcoal.	
25	N/A	1.25	1.24	0.07	Spread	NE–SW orientated rectangular spread of grey/yellow silty clay, firm compaction, with charcoal flecks.	
26	N/A	N/A	N/A	N/A	Not used	N/A	
27	C28	0.8	0.69	0.15	Fill of C28	Firm compaction of grey silty clay, no inclusions.	
28	N/A	0.8	0.69	0.15	Agricultural feature/tree bole	Rectangular in plan with rounded corners, N–S orientation, sharp break of slope at top, steep sloping sides, sharp break of slope at base, slightly concave base.	
29	N/A	1.45	0.7	0.08	Cut of charcoal spread	Sub-rectangular, E–W orientation, rounded corners, gentle break of slope at top, gentle sloping sides onto concave base.	
30	N/A	1.01	0.72	0.26	Cut of pit	Sub-rectangular N–S orientation, rounded corners, sharp break of slope at top, steep sloping sides, sharp break of slope at base; concave base.	
31	N/A	0.4	0.3	0.03	Burnt spread	Irregular shaped spread of black and red charcoal and clay.	
32	C33	0.8	0.4	0.16	Natural deposit/non archaeological	Grey / brown friable sandy silt, inclusions of charcoal.	
33	N/A	0.8	0.4	0.16	Cut of tree bole/non archaeological	Key-hole shaped, NE–SW orientation, gentle break of slope at top, gentle sloping sides onto concave base.	
34	C35	1.65	0.23	0.13	Furrow fill	Linear in plan, N–S orientation, moderate compaction of friable mid brown silty clay.	
35	N/A	1.65	0.23	0.13	Plough furrow	Linear in plan, N–S orientation, rounded corners, sharp break of slope at top, steep sloping sides onto concave base.	
36	N/A	0.65	0.5	0.15	Natural depression/non archaeological	Sub-rounded in plan, N–S orientation, rounded corners, gentle break of slope at top, gentle sloping sides onto concave base, filled by C15.	

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Finds
37	N/A	0.8	0.32	0.21	Natural depression/non archaeological	Sub-rounded in plan, N–S orientation, rounded corners, gentle break of slope at top, gentle sloping sides onto concave base, filled by C14.	

Appendix 1.2 Catalogue of Artefacts

Find Registration No.	Context	Item No.	Simple Name	Full Name	Material	No. of parts	Description
E2681:4:1	4	1	Pin shank	Copper alloy pin shank	Metal	1	Cu alloy possible pin shank with rectangular cross section
E2681:4:2	4	2	Pipe	Clay pipe fragments	Pottery	2	Post-medieval clay pipe stem fragments
E2681:4:3	4	3	Plate	19th/20thC plate sherd	Pottery	1	19th/20thC Pearlware plate sherd
E2681:4:4	4	4	Plate	19th/20thC plate chip	Pottery	1	19th/20thC Pearlware plate chip
E2681:4:5	4	5	Nail	Iron Object	Metal	1	Iron nail shank-incomplete
E2681:4:6	4	6	Bottle	Green glass bottle	Glass	1	Post-medieval green glass bottle sherd
E2681:4:7	4	7	Pottery	13thC pottery sherd	Pottery	1	13thC Dublin type ware sherd. Red earthen fabric, wheel thrown with patchy green glaze on interior surface
E2681:11:1	11	1	Iron bar	Iron Object	Metal	1	Possible iron bar-incomplete
E2681:12:1	12	1	Lithic	Late Mesolithic-Neolithic chert blade	Chert	1	Late Mesolithic-Neolithic chert blade

Appendix 1.3 Catalogue of Ecofacts

A total of nine bulk soil samples were taken during the course of the excavation at this site. All of these were processed by means of floatation and sieving through a 300µm mesh. The resulting retrieved samples of this process are listed below.

1.3.1 Animal Bone

Only one sample of animal bone was recovered from the site. This came from C8, the bottom fill of burnt feature C22. This piece was unidentifiable.

1.3.2 Seeds/Grains

Context number	Sample number	Feature	Sample weight (g)
22	4	Fill of hearth	N/A

1.3.3 Charcoal

Six charcoal samples were recovered from Russagh 4 and subsequently sent for identification.

Context number	Sample number	Feature	Sample weight (g)
24	1	Burnt clay fill of C19 hearth Area B	16.8g
23	2	Burnt clay fill of C20 hearth Area B	41.3g
27	3	Fill of C28 tree bowl Area C	0.1g
8	4	Fill of C22 hearth Area A	1.4g
31	7	Burnt spread Area A	3.0g
6	9	Fill of C30 small pit Area A	2.5g

Appendix 1.4 Archive Checklist

Project: N6 Kilbeggan – Athlone	**Irish Archaeological Consultancy Ltd**	
Site Name: Russagh 4		
NMS Number: E2681		
Ministerial Directive: A016/055		
Site director: Ellen O'Carroll		
Date: February 2006		
	Items (quantity)	**Comments**
Field Records		
Site drawings (plans)	6	Checked & digitised
Site sections, profiles, elevations	5	Digitised
Other plans, sketches, etc.	1	Site Matrix
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	1	Checked & digitised
Survey/levels data (origin information)	122	
Context sheets	37	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	51	On Server
Photographs (print)	0	
Photographs (slide)	0	
Finds and Environ. Archive		
Flint/chert	1	
Stone artefacts	0	
Pottery (specify periods/typology)	3 (PM)	
Ceramic Building Material (specify types eg daub, tile)	0	
Metal artefacts (specify types - bronze, iron)	2 (Fe); 1 (Cu)	
Glass	1	
Other find types or special finds (specify)	1	Clay pipe
Human bone (specify type eg cremated, skeleton, disarticulated)	0	
Animal bone	1	
Metallurgical waste	0	
Enviro bulk soil (specify no. of samples)	9	
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 AITIÚIL
DEPARTMENT OF THE ENVIRONMENT, HERITAGE
AND LOCAL GOVERNMENT

File: Direction No. A16

Registration Number: E2681

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 Ms. Ellen O'Carroll of Archaeological Consultant, 12 St. Peters Terrace, Adelaide Rd, Glenageary, Co. Dublin.

For a registration number to record excavation at the site of Russagh 055 being part of the townland of RUSSAGH 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 Eileen Harte 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

N6 KILBEGGAN - ATHLONE ROAD PROJECT

LITHICS FINDS REPORT FOR A016/055 RUSSAGH 4A

DR. FARINA STERNKE MA PHD

DEPARTMENT OF ARCHAEOLOGY
UNIVERSITY COLLEGE CORK

Introduction

One lithic find (E2681:12:1) from archaeological investigations along the route of the N6 Kilbeggan - Athlone Road at Russagh 4a, was presented for analysis (Table 1). The find was associated with modern agricultural features.

Find No.	Context	Area	Material	Type	Cortex	Cond.	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E2681:12:1	12	4A	Chert	Blade	No	Weathered	63	18	5	No	No

Table 1 Composition of the lithic assemblage from Russagh 4a (A016/055)

Methodology

The lithic artefact was examined visually and catalogued using Microsoft Excel. The following details were recorded for the artefact: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* (1999). The general typological and morphological classifications are based on Woodman *et al.* (2006).

Quantification

The lithic is a medium large chert blade.

Provenance

The lithic derives from the cut of an agricultural furrow.

Condition:

The lithic survives in weathered incomplete condition and is broken in two.

Technology/Morphology:

This very regular blade was produced using a soft stone hammer on a single platform core.

Dating:

This blade is technologically and morphologically diagnostic and most likely dates to the early Mesolithic or the Neolithic period.

Conservation

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

Discussion

The lithic find from archaeological investigations along the route of the N6 Kilbeggan - Athlone Road at Russagh 4a is an early Mesolithic or Neolithic blade which as a single find is of minor importance.

Bibliography

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

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

THE MEDIEVAL AND MODERN POTTERY FROM RUSSAGH 4, CO. OFFALY (A016/055)

CLARE MCCUTCHEON MA MIAI

Three sherds of pottery were presented for study. The site is described as 'a collection of geological actions on the landscape' and the context containing the sherds is described as the fill of a stream C4.

One of the sherds (C4:7) appears to be medieval in date, probably Dublin–type fineware and dating from the later 13th century. This is in red earthenware fabric, wheel-thrown and with a patchy green glaze on the interior. Normally interior glazing would be an indicator of post-medieval rather than medieval pottery but there are occasional exceptions as with bowls or accidental internal glaze runs.

The other two sherds are a body (C4:3) and a chip (C4:4) from a probable late 19th/early 20th century pearlware plate.

THE N6 KILBEGGAN-ATHLONE ROAD PROJECT

THE SMALL FINDS FROM A016-055 RUSSAGH 4 A

CATHERINE JOHNSON

Russagh 4A was a collection of geological actions on the landscape, early medieval charcoal production kilns, and modern agricultural features, such as furrows. The small assemblage of finds consists of glass and clay pipe fragments dating to the post-medieval period, and three incomplete and non-diagnostic metal objects.

Clay pipe
This site produced two post-medieval clay pipe stem fragments.

E2681:4:2 two small clay pipe stem fragments. L 14 mm, D 9 mm, Hole D 1mm and L 19mm, D 7mm, Hole D 1mm.

Bottle glass
The glass assemblage consists of a single body sherd from a green glass bottle, dating to the post medieval period or later.

E2681:4:6 Area 4A is a small body sherd of pale green bottle glass. L 38mm, W 33mm, T 4.5mm.

Metal
The metal assemblage consists of an iron nail shank and a forked object, possibly part of a metal scissors. Both objects are coated with grit and corrosion products and X-rays were necessary to aid identification. A copper alloy shank was also recovered and is likely to belong to a pin.

Pin shank?

E2681:4:1 *Area 4A* is a copper alloy shank, which tapers to a damaged tip. The object is bent into a hook at the narrow end and broken across the broad end. Rectangular section. The shank is in poor condition, with verdigris and corrosion products on the surface. L. 24 mms. W. 1.5mms. T. 1mm.

Nail shank

E2681:4:5 *Area 4A* is a bent, tapering nail shank, broken below the head and coated with soil and corrosion products. L. 40 mms. W. 10.5 mms. T. 11 mms.

Scissors fragment?

E2681:10:1 *Area 4A* is a heavily soil encrusted object, which appears from the X-ray to be part of a small metal scissors. Rectangular section. One intact blade, with curved back and straight cutting edge, the other blade is broken away below the tip. The circular pivot is *in situ* and measures 1.5 mms in diameter. The handles are broken away below the pivot. Overall L. 68 mms. W. 32. mms. T. 25 mms. Blade width (from x-ray) 4.5 mms.

N6 KILBEGGAN TO ATHLONE
PLANT REMAINS REPORT
FOR
RUSSAGH 4 A016/055

SUSAN LYONS MSC MIAI
ENVIRONMENTAL ARCHAEOLOGIST

PROJECT CODE: PM/ 028
CLIENT: IAC LTD
DATE: AUGUST 2008

1. INTRODUCTION

This report discusses the plant remains assemblage recovered from the soil samples associated with the archaeological excavations at Russagh 4, Co. Offaly, along the N6 Phase 2 Kilbeggan to Athlone Dual Carriageway Scheme.

2. BACKGROUND

An archaeological excavation was carried out at Russagh 4, Co. Offaly by Ellen O'Carroll for Irish Archaeological Consultancy Ltd (IAC Ltd) on behalf of Westmeath County Council and the National Roads Authority as part of the archaeological mitigation program associated with the N6 Phase 2 Kilbeggan to Athlone Dual Carriageway Scheme under the Ministerial Direction Number A016/055 and NMS number [E2681].

The excavation at Russagh 4 comprised of a series of pits, hearths and burnt spreads, with no finds recovered to date any features (O'Carroll, 2007). Radiocarbon dating of charcoal from the site has returned an early medieval date (Cal AD 994–1153; Cal AD 1042–1211 [2 Sigma calibration]) for the activities at the site.

3. SAMPLE STRATEGY

An on-site soil sampling strategy was implemented and features and deposits deemed archaeologically significance were sampled. Soil samples were processed by a system of flotation, whereby each sample was soaked in water in order to suspend the carbonised material; the floated material (flot) was then poured off and trapped in a sieve (mesh size 300µm). The flot was then dried and stored in a sealed plastic bag for further specialist analysis. The remaining material (retent) was wet-sieved through a 1mm mesh and air-dried. This would then have been sorted by eye and any material of archaeological significance would have been removed and recorded. The samples were processed by post-excavation staff at IAC Ltd under the supervision of Sarah Cobain.

The remains of one flot (Context 8, Sample 4) were subsequently submitted to Susan Lyons in October 2007 to identify and analyse the plant material within. The primary objective of this project was to identify where possible any botanical remains present in order to help with interpreting the function or use of the site.

4. METHODOLOGY

The flot material was viewed under a low powered binocular microscope (magnification x0.8 to x5) and any carbonised or potentially waterlogged botanical materials were removed and identified to genus/species level where applicable. The plant remains were recorded using an abundance key to highlight the concentrations/quantities of material identified from each sample; + = rare (1–5), ++ = occasional (6–10), +++ = common (11–50) and ++++ = abundant (>50).

Identifications were made using reference to the author's seed collection and standard seed atlases and references; *Flora of the British Isles* (Clapham, A R, Tutin, T G, Warburg, E F, 1957), *Zadenatlas der Nederlandsche Flora* (Beijerinck, W.1976), *New Flora of the British Isles 2nd Edition* (Stace, C, 1997) and *Digital Seed Atlas of the Netherlands* (Cappers, R.T.J., Bekker, R.M. and Jans, J.E.A. 2006).

5. RESULTS

Preservation was by charring and the results are summarised in Table 1.

Carbonised cereal grain – One bread/wheat (*Triticum aestivum/compactum* sp.) grain was recorded from Context 8 (fill of hearth feature).

Fragments of vesicular and eroded grains were also recorded from Context 8 and these appear in the table as indeterminate grain. Due to the abraded nature of this material it was difficult to identify these grains to species level. Cereal grains can become eroded and abraded as a result of charring at high temperatures, or if the grain was damp when burnt or if this material had degraded due to redeposition and/or exposure.

Table 1. Composition of the plant remains from Russagh 4 (A016/055)

Context Number	Sample Number	Context Description	Carbonised cereal grain	Comments
8	4	Fill of hearth feature	+	*Triticum aestivum/compactum* + Cereal indet +

Key: + = rare (1–5), ++ = occasional (6–10), +++ = common (11–50) and ++++ = abundant (>50)

6. DISCUSSION

While the archaeobotanical material recorded from Context 8 (fill of hearth feature) was very low, the presence of a charred wheat grain and indeterminate grains is most probably indicative of domestic activity at the site, albeit sparse. Despite the material being recovered from a hearth feature, it is difficult to ascertain whether the grains were associated with the activity surrounding this feature (i.e. corn drying activities) or residual debris from crop processing/corn drying which would have become re-deposited across the site entering open features inadvertently.

7. CONCLUSIONS

The botanical material from Russagh 4 is very low and while it does represent the remains of some form of domestic activity little more can be postulated about the use of cereal grains at the site based on such a small assemblage.

8. REFERENCES

Beijerinck, W 1976 *Zadenatlas der Nederlandsche Flora*. Amsterdam: Backhuys & Meesters.

Cappers, R T J Bekker R M & Jans J E A 2006 *Digital Seed Atlas of the Netherlands*. Groningen, Netherlands: Barkhuis Publishing & Groningen University Library.

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O'Carroll, E 2007 *N6 Kinnegad – Athlone Scheme Phase 2: Kilbeggan to Athlone Dual Carriageway Site A016/055 Russagh 4: Preliminary Archaeological Report.* IAC Ltd unpublished report.

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CHARCOAL IDENTIFICATIONS

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

MINISTERIAL DIRECTION NUMBER: A016/055
NMS REGISTRATION NUMBER: E2681
RUSSAGH 4

Ellen O'Carroll MA DIP. EIA Mgt
Archaeological Consultancy & Wood Specialist
8 Cumberland Street, Dun Laoghaire, Co. Dublin
Mob: + 353 (0) 086 8241753
Tel/Fax:+ 353 (0)1 2360795
Email: eocarroll@ireland.com

1 Introduction

Six samples were submitted for analysis. The charcoal was sent for species identification prior to ^{14}C dating and also to give an indication of the range of tree species, which grew in the area at the time of use of the site. Charcoal analysis may provide information on the utilization of certain species for various functions. Wood used for fuel at prehistoric sites would generally have been collected 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 for certain structural requirements or particular functions.

This site is located in the townland of Russagh, c. 5km north of Clara town, Co. Offaly. 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 site excavated at Russagh 4 was split into 3 separate areas.

Area A consisted of two silted up stream beds, one that ran southwest–northeast from the northeast corner of the site and another that ran northwest–southeast into the other stream at the south end of the site. Around the edge of the stream channels were three episodes of *in-situ* burning and a pit that had later silted up. The streams appeared to have filled up over the top of one of the burnt features showing that the burning was contemporary with the streams flowing. All finds from the fill of the stream channels were post-medieval. The areas of burning may have been a result of land clearance. Find E2681:12:1, a medium large chert blade, found in the fill of a furrow was considered to have been brought onto the site through ploughing disturbance and although unrelated to the site suggested prehistoric activity nearby.

Area B contained two charcoal production kilns. One of the charcoal production kilns was sub-rectangular and although shallow contained two fills of which the primary fill was charcoal rich and showed signs of *in-situ* burning. The large circular example also contained large quantities of charcoal and signs of *in-situ* burning.

Area C provided evidence of modern agricultural activity and natural root action.

The samples analysed were retrieved from the fill of a hearth C22, charcoal production kilns C19 and C20, spread C31, natural tree root C27. The charcoal production kilns have been dated to the medieval periods centring on the 11th and 12th Centuries AD.

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). 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 Nikon SMZ800 zoom stereomicroscope at magnifications x 10 – 190 and a transmitted light compound microscope at magnifications of x 10 – 400. 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 charcoal samples were identified by weight

and fragment count whereby each species was grouped together and a total weight and fragment count was obtained.

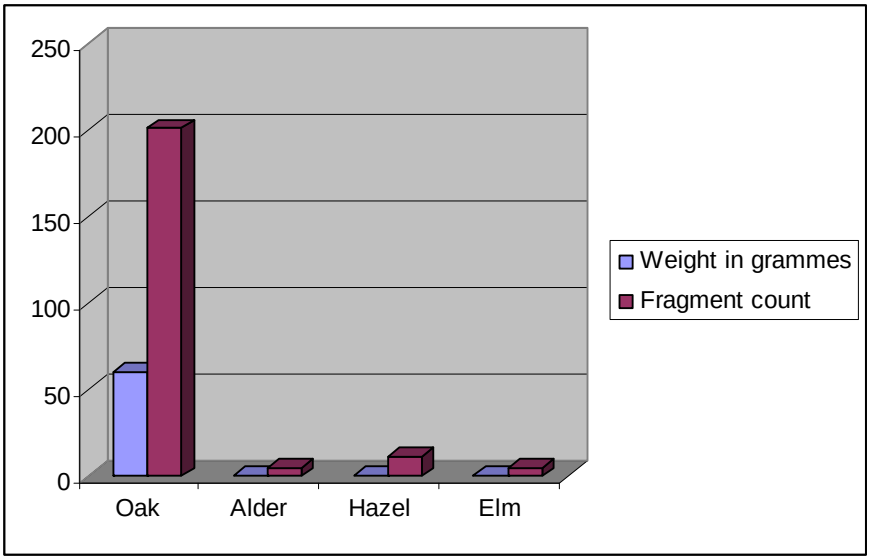
3 RESULTS

Table 1: Results from charcoal identifications

Site no.	Context no	Context type	Sample no.	Species	Comment
A016-055	27	Natural tree root, Area C	3	Oak (0.03g*, 1f*)	
A016-055	22	Hearth C22	4	Oak (0.3g, 15f), Alder (0.08g, 5f),	Sample contained much grit and organics
A016-055	31	Spread, Area A	7	Oak (7yrs, 1.01g, 45f), hazel twigs (0.5g, 5f)	
A016-055	9	Hearth C22	6	Oak (1.05g, 40f), Elm (0.3g, 5f), Hazel (0.2g, 6f)	
A016-055	23	Fill of charcoal production kiln C20	2	Oak (41.3g, 50f)	Date AD 994–1153
A016-055	24	Fill of charcoal production kiln C19	1	Oak (16.8g, 50f)	Date AD 1042–1211

* = grammes
* = fragment count

Figure 1: Results from charcoal identifications



4 Discussion & Conclusions

Two hundred and twenty two fragments from six samples were identified. There were only four taxa identified from the identifications (Figure 1). Oak (*Quercus* sp) was the dominant taxon identified from the charcoal remains (Table 1 & Figure 1). Oak was exclusively present charcoal production kilns C20 and C19 dated to the medieval periods. Oak was also frequently identified from the hearth C22 and the spread C31. Alder hazel twigs along with elm were identified from hearth C22.

It is clear from the results above that oak was specifically collected and used for industrial activities and charcoal production at the site in the early medieval period. Oak is a dense wood and is very suitable for charcoal production. It also makes good

firewood when dried and will grow in wetland areas when conditions are dry. Oak also has unique properties of great durability and strength. 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. Pedunculate 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.

Oak may also have also been selected for use as kindling for the hearths and fires excavated alongside the stream beds. Elm and hazel, dryland taxa, were also present in the landscape as well as alder, a wetland tree. A date for the activity carried out in Area A has not been returned therefore no comparisons can be made with other known sites in the surrounding landscape and their associated wood use.

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
RUSSAGH 4

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-9157
Date of Measurement:	2008-05-19
Site:	A016/055 Russagh Co.Offaly
Sample ID:	S1 C24
Material Dated:	Oak
Pretreatment:	AAA
Submitted by:	IAC

^{14}C Date: 983±27

AMS δ^{13}C: -24.4

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 C24
UBA-9157
Radiocarbon Age BP    983 +/-   27
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 AD 1017- 1045                     0.605
                             1095- 1120                     0.324
                             1141- 1147                     0.071
  95.4 (2 sigma)      cal AD 994- 1053                      0.537
                             1079- 1153                     0.463
```

```
 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.
```

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-9158
Date of Measurement:	2008-05-19
Site:	A016/055 Russagh Co.Offaly
Sample ID:	S2 C23
Material Dated:	Oak bark
Pretreatment:	AAA
Submitted by:	IAC

^{14}C Date: 898±24
AMS δ^{13}C: -26.2

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
```

```
 S2 C23
 UBA-9158
 Radiocarbon Age BP    898 +/-   24
 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 AD 1048- 1086                    0.486
                              1123- 1138                    0.155
                              1150- 1181                    0.358
   95.4 (2 sigma)      cal AD 1042- 1106                    0.439
                              1117- 1211                    0.561
```

```
 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.

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where ^2 = quantity squared.
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0* represents a "negative" age BP
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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

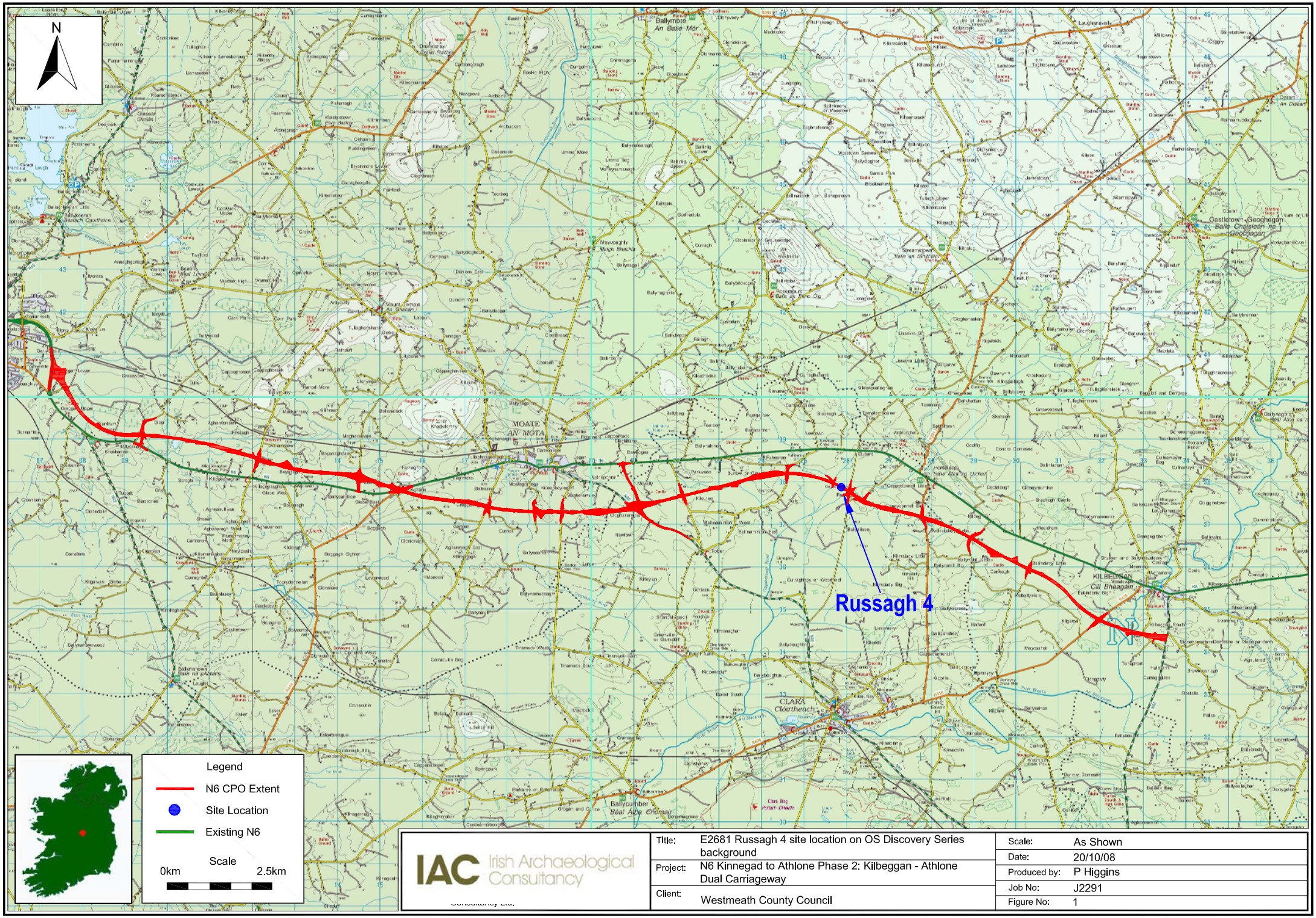
RMP No	Description
OF002-009	Earthwork Site
OF002-010	De-listed Enclosure possible
OF002-011	Delisted Enclosure site
OF002-012	Enclosure Site
OF002-018	Enclosure Site
OF002-019	Watermill – Horizontal Site
OF002-020	De-listed Earthwork site
OF002-021	De-listed Ringfort/ Rath

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:	E2681 Russagh 4 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

FAHEERAN

NEWTOWN
ED KILCUMREAGH

DUNARD

ARDNURCHER

CLONCRAFF

CAPPYDONNELL
LITTLE

OF002-009

OF002-010
DE-LISTED

OF002-011
DE-LISTED

OF002-012

Russagh 4

Russagh 1

Russagh 2

Russagh 3

RUSSAGH
Rúscach

TULLY
An Tulaigh
ED KILCUMREAGH
Cill Chrumthir Thiochrach

TULLY
An Tulaigh
ED GORTEEN
An Goirtín

EAST
Meantán Thoir

OF002-018

OF002-019

OF002-020

OF002-021
DE-LISTED

Cappydonnell 1

Legend

N6 CPO Line

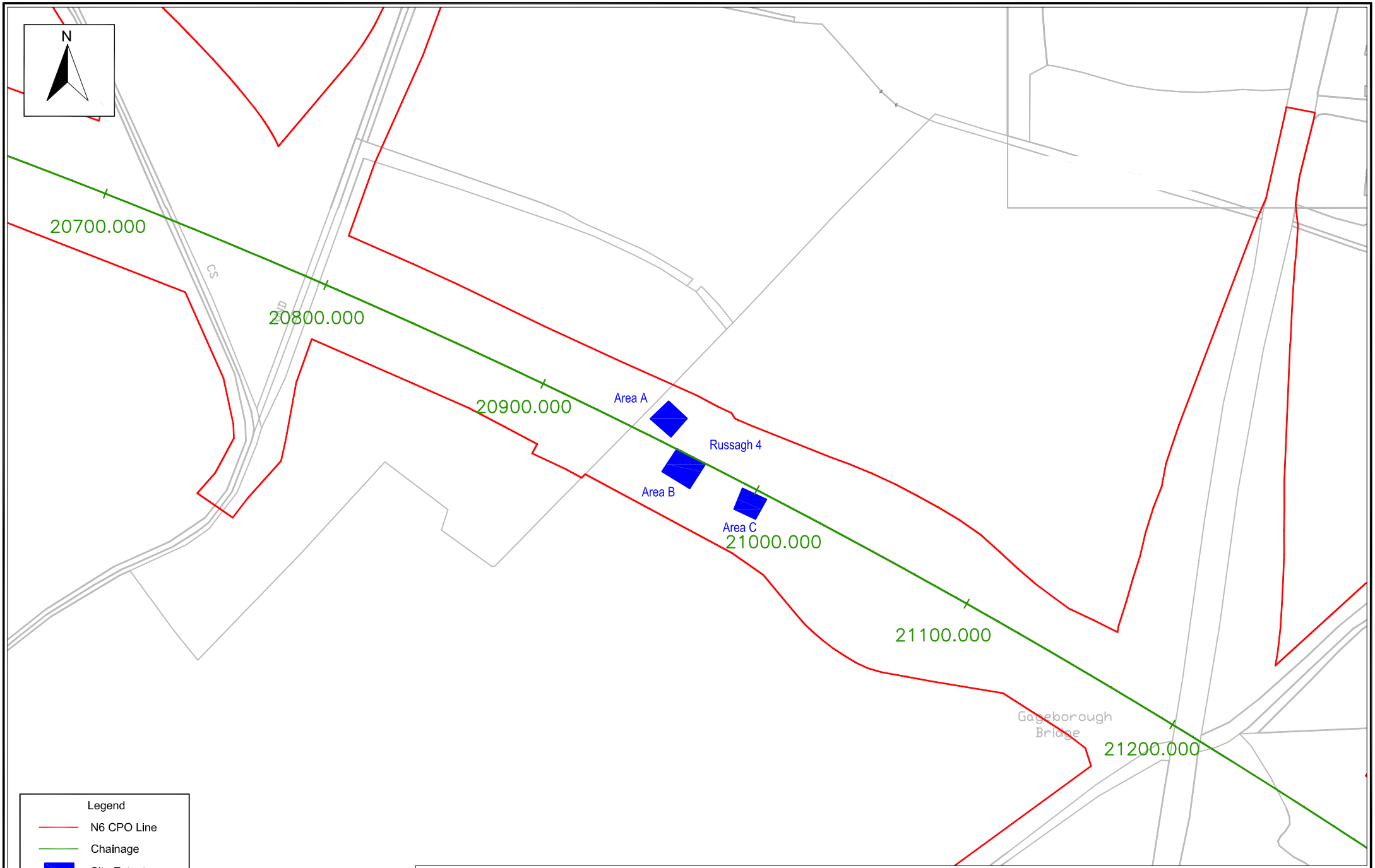
RMPs

Scale

0m 250m

Title:	E2681 Russagh 4 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: 02/04/09	Figure No: 2
Produced by: P Higgins	

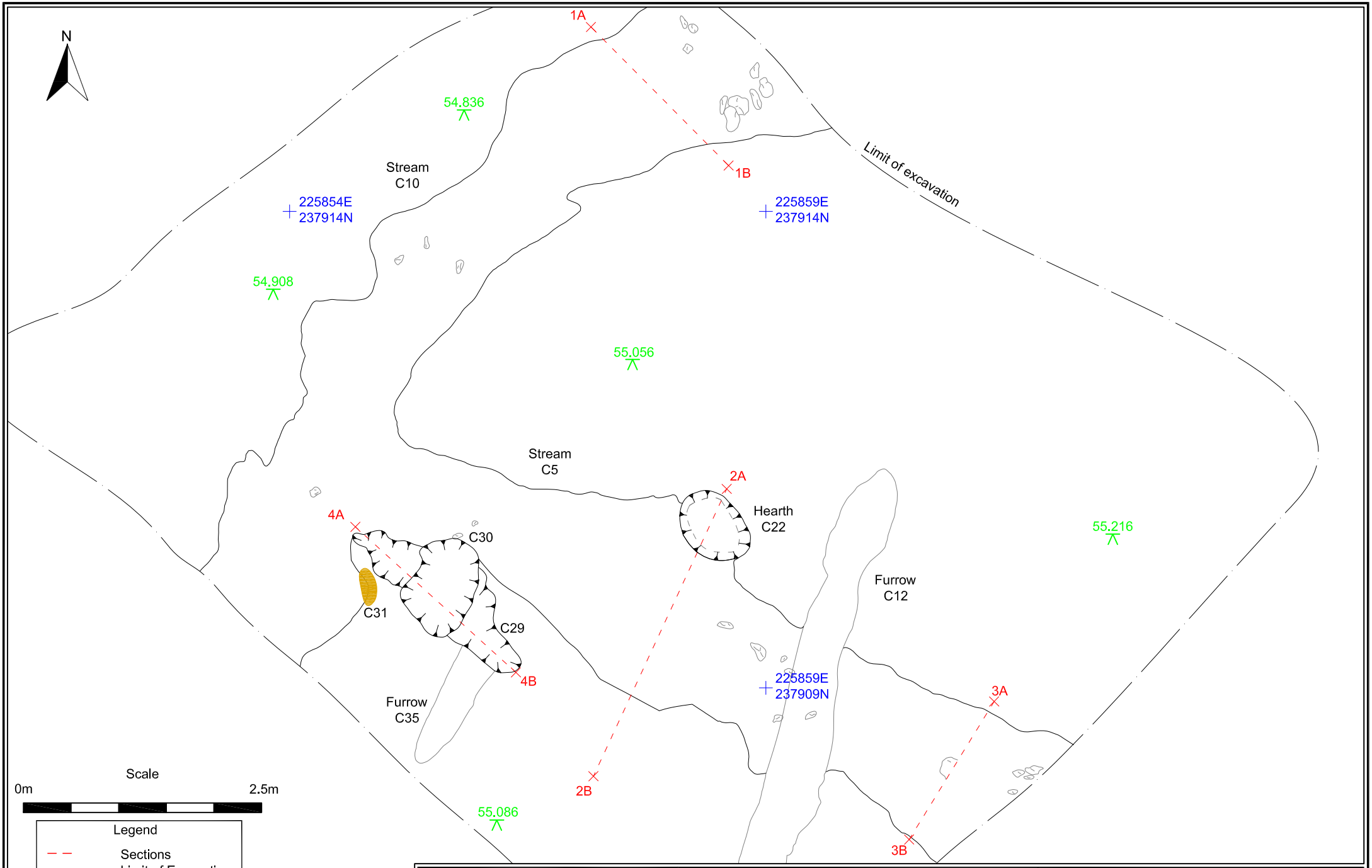
IAC Irish Archaeological Consultancy



IAC Irish Archaeological Consultancy

Title:	E2681 Russagh 4 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:	02/04/09
Produced by:	P Higgins
Job No:	J2291
Figure No:	3

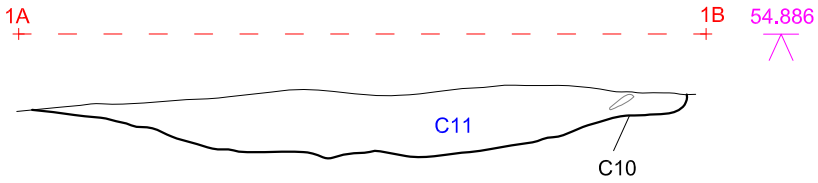


IAC Irish Archaeological Consultancy

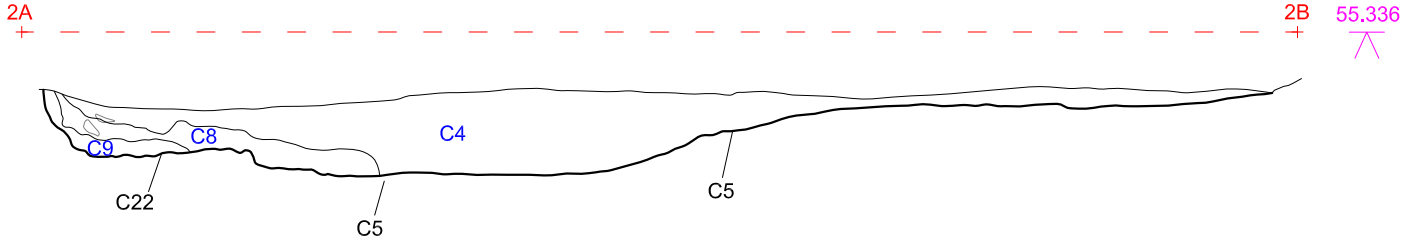
Title:	E2681 Russagh 4 plan of area A
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:50 @ A4
Date:	02/04/09
Produced by:	G Kearney
Job No:	J2291
Figure No:	4

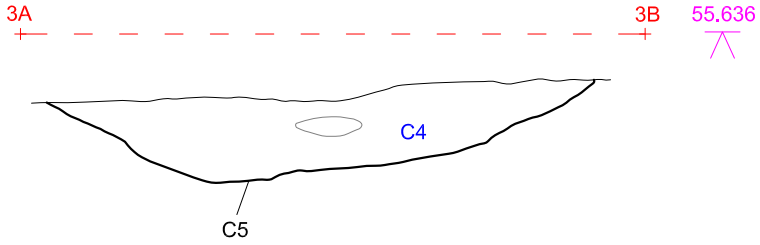
Russagh 4
Southwest facing section of C10



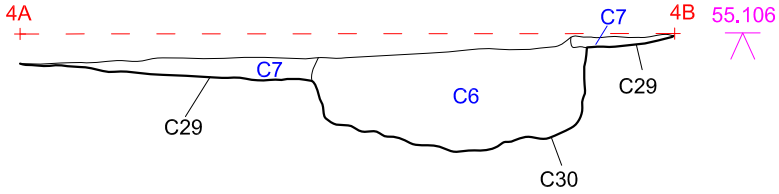
Russagh 4
Northwest facing section of C5



Russagh 4
Northwest facing section of C5



Russagh 4
Southwest facing section of C29,C30



Scale

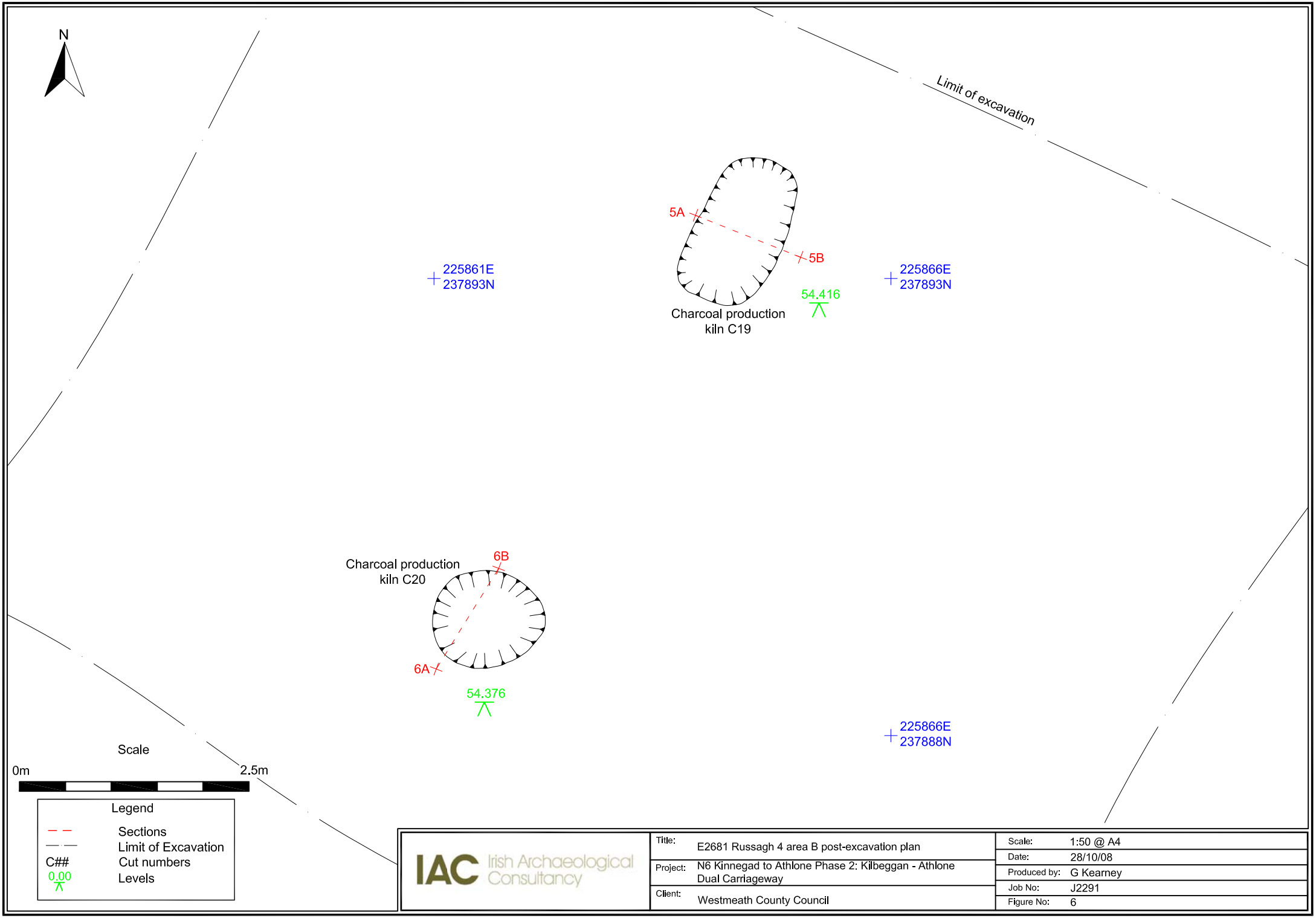
Legend

C##	Cut numbers
C##	Fill Numbers
	Stone
#	Charcoal
###.##	Reduced Levels

IAC Irish Archaeological Consultancy

Title:	E2681 Russagh 4 area A sections 1 - 4
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:20 @ A4
Date:	28/10/08
Produced by:	G Kearney
Job No:	J2291
Figure No:	5

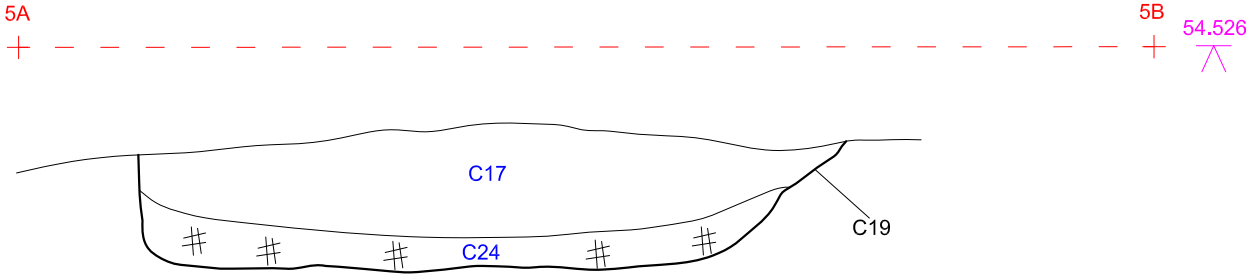


IAC Irish Archaeological Consultancy

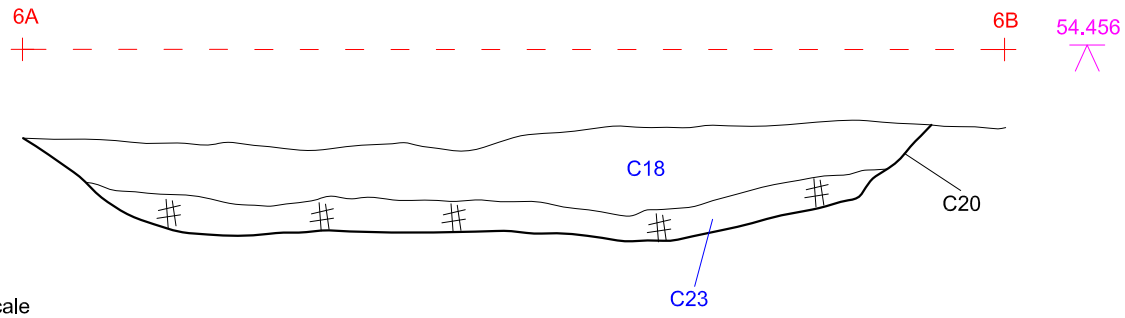
Title:	E2681 Russagh 4 area B post-excavation plan
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:50 @ A4
Date:	28/10/08
Produced by:	G Kearney
Job No:	J2291
Figure No:	6

Russagh 4
Southwest facing section of charcoal production kiln C19



Russagh 4
Southeast facing section of charcoal production kiln C20



Scale

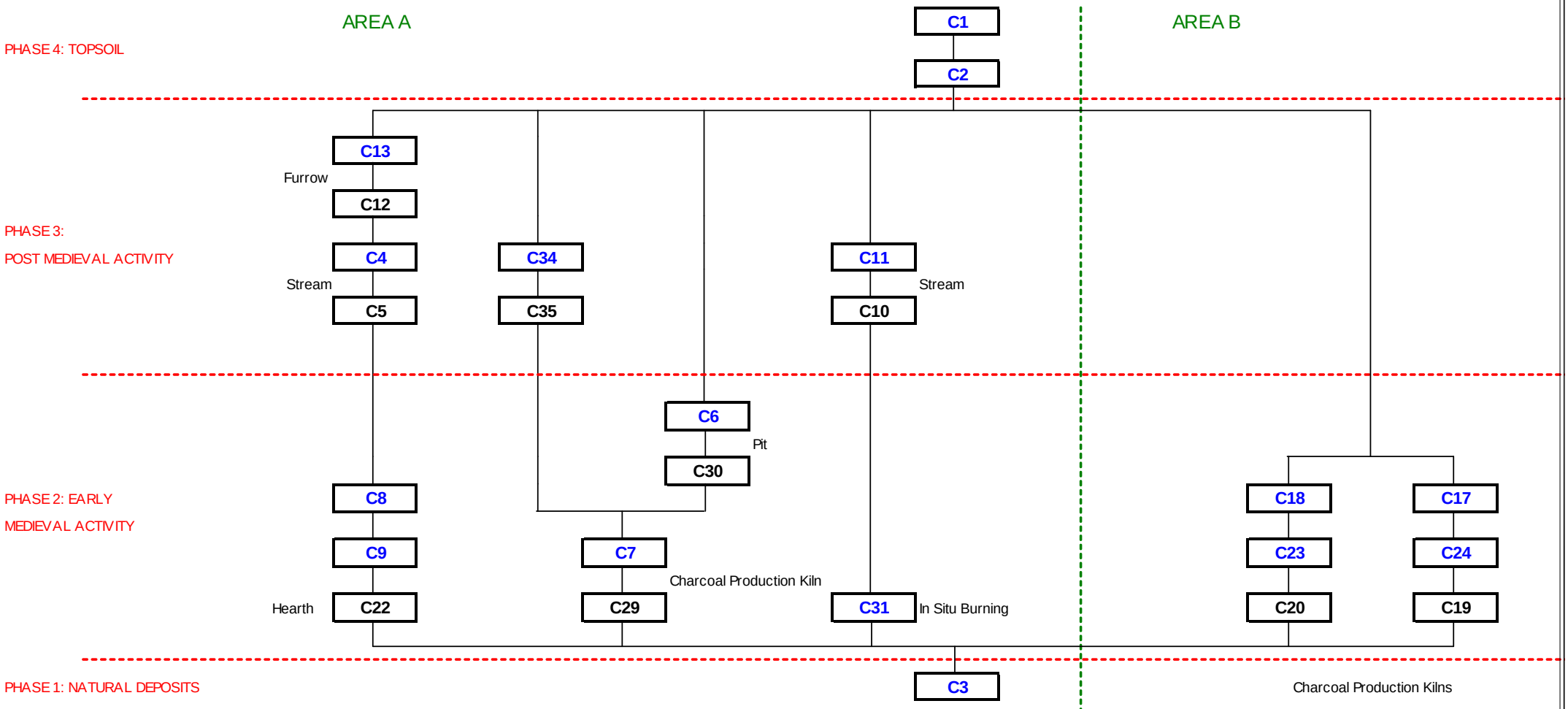
0m 0.5m

Legend

C##	Cut numbers
C##	Fill Numbers
#	Charcoal
###.##	Reduced Levels

IAC Irish Archaeological Consultancy

Title:	E2681 Russagh 4 area B sections 5 - 6
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council
Scale:	1:10 @ A4
Date:	02/04/09
Produced by:	G Kearney
Job No:	J2291
Figure No:	7



CXXX = SPREADS AND FILL CONTEXTS
CXXX = CUT CONTEXTS

IAC Irish Archaeological Consultancy

Title:	E2681 Russagh 4 matrix
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	N.T.S.
Date:	23/04/09
Produced by:	G Kearney
Job No:	J2291
Figure No:	8