N9/N10 KILCULLEN TO WATERFORD SCHEME, PHASE 4 – KNOCKTOPHER TO POWERSTOWN

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3614
Site Name	AR074, Ennisnag 1
Townland	Ennisnag
County	Kilkenny
Excavation Director	Richard Jennings
NGR	251417 145689
Chainage	33740

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

MARCH 2011

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project	N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown
Ministerial Direction Reference No.	A032
Excavation Registration Number	E3614
Excavation Director	Richard Jennings
Senior Archaeologist	Tim Coughlan
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Kilkenny County Council
Site Name	AR074, Ennisnag 1
Site Type	Prehistoric structure
Townland(s)	Ennisnag
Parish	Ennisnag
County	Kilkenny
NGR (easting)	251417
NGR (northing)	145689
Chainage	33740
Height OD (m)	62.521
RMP No.	N/A
Excavation Dates	20–31 August 2007
Project Duration	20 March 2007–18 April 2008
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Report By	Richard Jennings and Tim Coughlan
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This final report has been prepared by Irish Archaeological Consultancy Ltd in compliance with the directions issued to Kilkenny County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930–2004 and the terms of the Contract between Kilkenny County Council and Irish Archaeological Consultancy Ltd.

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ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by the National Roads Authority (NRA) through Kilkenny County Council, undertook an excavation at the site of AR074, Ennisnag 1 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Figure 1). The following report describes the results of archaeological excavation at that site. The area was fully excavated by Richard Jennings under Ministerial Direction A032 and Excavation Registration Number E3614 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between 20 August and 1 September 2007.

The site was found off the brow of a hill, on a north-east facing slope that overlooked a small stream to the east. The most significant feature on the site was a linear slot-trench. Small freshly broken sherds of Neolithic carinated bowl were found within the brown sandy silt fill of the slot-trench. Four possible postholes were found close to the slot-trench. The slot-trench and the postholes possibly formed a temporary structure *c.* 3m by 4m in size, although radiocarbon dating evidence suggests that they may not be contemporary. Ten further pits / postholes were found within the 25m^2 excavation area but none conformed to any obvious structural pattern. The site may represent a temporary camp site.

The site produced eight sherds (plus five fragments, weight: 28g) representing two early Neolithic carinated bowls. The pottery is well-fired and little worn with mainly fresh surfaces and edge breaks. All of the material has quartzite inclusions. The fabric and inclusions indicate that the material represents the earliest type of Neolithic pottery in Ireland which is widely dated to *c.* 4000–3700 BC

A sample of Ash charcoal from the slot-trench was sent for radiocarbon dating and returned a 2 sigma calibrated date of 3518–3368BC (UBA 15544). A sample of hazelnut shell from one of the postholes associated with the structure was sent for radiocarbon dating and returned a 2 sigma calibrated date of 3941–3696BC (UBA 15545)

The site has produced evidence of a possible temporary shelter dated to the early Neolithic. Two possible phases, indicated by radiocarbon dating, and the presence of freshly broken sherds of carinated bowl within the slot-trench suggest that the site may have had a more ritual significance to the early Neolithic community. The site is of local importance as it represents the first evidence of early prehistory in the immediate area. The site is of regional importance as together with the results of other excavations along the N9/N10 Phase 4: Knocktopher to Powerstown it has widened our knowledge of the nature and distribution of early Neolithic settlement.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Ennisnag 1, AR074 (Figure 1), in the townland of Ennisnag undertaken by Richard Jennings of IAC, on behalf of Kilkenny County Council and the NRA, in accordance with the Code of Practice between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands. It was carried out as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4, which extends between Knocktopher in Co. Kilkenny to Powerstown in Co. Carlow. The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

The site measured 771m^2 and was first identified during testing carried out between 30 January and 3 March 2006 by Melanie McQuade (E3882) for Margaret Gowen & Co. Ltd. on behalf of the National Roads Authority – Excavation registration No E2882. Ennisnag 1 was excavated between 20 August and 1 September 2007 with a team of one director, one supervisor and seven assistant archaeologists.

1.2 The Development

For the purposes of construction, the N9/N10 Kilcullen to Waterford Road Scheme has been divided into separate sections, known as Phases 1–4. Phase 2 of the scheme extends from the tie-in to the Waterford City Bypass at Dunkitt, to Knocktopher in Co. Kilkenny (Ch. 2+000–Ch. 25+400). Phase 4 continues from Knocktopher to Powerstown in Co. Carlow (Ch. 25+400–Ch. 76+000) and includes the Kilkenny Link Road.

The roadway of the entire scheme includes approximately 64km of mainline high quality dual carriageway and 6.2km of the Kilkenny Link Road, which will connect the road development to the Kilkenny Ring Road Extension. The road development requires the realignment and modification of existing national, regional and local roads where the mainline intersects them. It requires the acquisition of 305 hectares of land for its construction. A further link road will connect the scheme to Paulstown in County Kilkenny, while six new grade separated junctions and three roundabouts are part of the road development.

1.3 Archaeological Requirements

The archaeological requirements for the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4: Knocktopher to Powerstown, are outlined in the Archaeological Directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Knocktopher, Co. Kilkenny, and Powerstown, Co. Carlow.

The proposed N9/N10 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Valerie J. Keeley Ltd and published in February 2005. The Record of Monuments and Places, the Site Monument Record, Topographical files, aerial photography, the Kilkenny and Carlow County Archaeological Urban Survey, and literary sources were all consulted. Two phases of geophysical survey were also conducted by Target (post-EIS geophysics carried out by ArchaeoPhysica) and an aerial survey was carried out by Margaret Gowen & Co. Ltd. As a result of the paper survey, field inspections and geophysical

survey, 35 sites were recorded in proximity to this section of the overall route alignment.

A previous archaeological assessment of Phase 2 of the scheme (test trenching conducted by Margaret Gowen & Co. Ltd. in 2006) extended into the lands acquired for Phase 4 to a point at Ch. 37+100 in the townland of Rathclogh, Co. Kilkenny. Thirty-four archaeological sites were identified within this area between Knocktopher and Rathclogh and subsequently excavated by Irish Archaeological Consultancy Ltd. as part of this archaeological contract.

Advance archaeological testing of the area between Rathclogh (Ch. 37+100) and Powerstown (Ch. 76+000) was completed by IAC during March–May 2007 and excavation of the sites identified during this process was also conducted by IAC between August 2007 and April 2008.

1.4 Methodology

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

All archaeological features were fully excavated by hand and recorded on *pro forma* record sheets using a single context recording system best suited to rural environment, with multi context plans and sections being recorded at a scale of 1:50, 1:20 or 1:10 as appropriate.

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

An environmental strategy was devised at the beginning of the excavation based on IAC in-house post-excavation and site methodologies and guidelines. Features exhibiting large amounts of carbonised material were the primary targets.

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

All dating of samples from the site was carried out by means of AMS (Accelerator Mass Spectrometry) Radiocarbon Dating of identified and recommended wood charcoal and charred plant remains samples. All calibrated radiocarbon dates in this report are quoted to two Sigma. Dating of the site also involved pottery analysis through typological study.

All excavation and post excavation works were carried out in accordance with the relevant approvals and in consultation and agreement with the National Roads Authority (NRA) Project Archaeologist, the National Monuments Section of the DoEHLG and the National Museum of Ireland. Where necessary licences to alter and export archaeological objects were sought from the National Museum of Ireland.

References to other sites excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown are referenced throughout this report only by their site name e.g.

Paulstown 1. A list of these sites and details including director's name and National Monuments Excavation Reference Number can be referenced in Appendix 4.

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the N9/N10 Phase 4: Knocktopher to Powerstown excavations.

Mesolithic: 7000–4000BC
Neolithic: 4000–2500BC
Early Bronze Age: 2500–1700BC
Middle Bronze Age: 1700–1200BC
Late Bronze Age: 1200–800BC
Iron Age: 800BC–AD500
Early medieval period: AD500–1100
Medieval period: AD1100–1600
Post-medieval: AD1600–1800

Source:
Carlin, N., Clarke, L. & Walsh, F. 2008 *The M4 Kinnegad-Enfield-Kilcock Motorway: The Archaeology of Life and Death on the Boyne Floodplain*. NRA Monograph Series No. 2, Wordwell, Bray.

2 EXCAVATION RESULTS

Ennisnag 2 was found on the eastern slopes of a hill overlooking a river valley. The river is a small tributary that feeds into the King's River at Ennisnag from the Slieveardagh Hills located 18km north-west of the site. This particular point of the river valley appears to have been important in prehistory and early medieval times because multi-period sites Danesfort 12 and Danesfort 13 and *fulacht fiadh* Danesfort 2 were found in the valley and four ringforts are recorded on its surrounding hills (RMP sites KK023-076–079; Figure 2). While a hedgerow obstructed the view of the Slieveardagh Hills from the site, the North Kilkenny hills were visible 12km to the north, the Booley Hills 20km to the south, and the Blackstairs Mountains 33km to the east. All appeared low on the horizon and indistinctive. The view to the south-east extended only as far as the opposite side of the valley, where RMP KK023-080, ringwork with a folly/ turret on top, is located on a small hill (see Plate 1).

2.1 Phase 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Light yellowish brown sandy clay	Subsoil

2.2 Phase 2 Prehistoric Activity

The prehistoric activity consisted of a house structure or temporary shelter and some related postholes and pits.

2.2.1 House structure

The structure extended over an area measuring 5.50m x 5.20m and consisted of a slot-trench (C17) and four postholes (Figure 4; Plate 2).

2.2.1.1 Slot-trench

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C17	N/A	3.75	0.25	0.10	Curvilinear cut	Cut of curvilinear feature
C32	C17	3.75	0.25	0.10	Dark brown sandy silt	Fill of linear feature

Finds

Context	Find Number	Material	Period	Description
C32	E3614:032:1	Quartz, crystal	Neolithic or early Bronze Age	1 piece debitage
C32	E3614:032:2	Flint	Neolithic or early Bronze Age	1 piece debitage
C32	E3614:032:3-15	Pottery	Early Neolithic	Sherds of early Neolithic carinated bowls

The slot-trench ran north–south and was parallel to the course of the river tributary at the bottom of the valley below. The shallow nature of C17 means it is possible that other slot-trenches once formed part of the structure but that they did not survive in the archaeological record.

Thirteen sherds of early Neolithic pottery were recovered from the slot trench fill C32 (Grogan and Roche Appendix 2.1). These were identified as eight sherds and five fragments representing two early Neolithic carinated bowls (*Ibid*.)*.*

Two pieces of debitage were also recovered from the slot trench fill C32, one is a piece of quartz crystal debitage and the other is flint debitage (Sternke Appendix 2.2). The debitage may indicate that lithic production or tool re-sharpening took place at this site and the pieces most likely date to the Neolithic or early Bronze Age period (*Ibid.*)*.*

Slot trench C17 contained ash (*Fraxinus excelsior)*, pomaceous (*Pomoideae spp.)* woods, and the only evidence for oak (*Quercus sp*) charcoal (Lyons, Appendix 2.3). The presence of oak was again quite low and while this could represent the remains of structural wood, it is also likely that it entered these deposits inadvertently as re-deposited material (*Ibid.*).

Fragments of hazelnut (*Corylus avellana* L.) shell fragments were retrieved from slot trench fill C32 (Johnston Appendix 2.4). This small collection of hazelnut shell fragments is not a significant indicator of site diet (*Ibid*.)

A small fragment (0.1g) of charred hazelnut shell was chosen for AMS dating from C32 and returned a result of 4665±25 (UBA 15544). The 2 Sigma calibrated result for this was 3518–3368BC (QUB, Appendix 2.3) dating this feature to the middle Neolithic.

2.2.1.2 Postholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C15	N/A	0.18	0.17	0.13	Oval shaped cut	Cut of posthole
C16	C15	0.18	0.17	0.13	Mid-brown clayey silt	Fill of posthole
C18	N/A	0.35	0.33	0.20	Sub-circular cut	Cut of posthole
C19	C18	0.35	0.33	0.20	Mid-brown silty clay	Fill of posthole
C26	N/A	0.28	0.28	0.18	Circular cut	Cut of posthole
C27	C26	0.28	0.28	0.10	Mid-brown silty clay	Fill of posthole
C28	C26	0.28	0.28	0.15	Mid-brown silty clay	Fill of posthole
C34	N/A	0.28	0.28	0.23	Circular cut	Cut of posthole
C35	C34	0.28	0.28	0.23	Mid-brown silty clay	Fill of posthole

Finds: None

Two of the postholes were located to the north and south of the slot trench C17 - C26 and C34 respectively. The other two were located to the west. It appeared that these were directly associated with the slot trench however the differences in returned radiocarbon dates could indicate two separate phases of activity.

Ash (*Fraxinus excelsior)* charcoal fragments were identified from the posthole fills C28 and C35 (Lyons, Appendix 2.3). Ash was a popular wood used in construction during the prehistoric period (*Ibid*.).

A small fragment (0.4g) of ash charcoal was chosen for AMS dating from C35 and returned a result of 4998±33 (UBA 15545). The 2 Sigma calibrated result for this was 3941–3696BC (QUB, Appendix 2.3) dating this feature to the early Neolithic.

2.2.2 Other postholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	0.21	0.17	0.20	Oval shaped cut	Cut of posthole
C4	N/A	0.14	0.16	0.11	Irregular cut	Cut of posthole
C5	C4	0.15	0.16	0.07	Mid brown soil	Fill of posthole
C6	C4	0.14	0.16	0.30	Orange burnt clay	Fill of posthole
C7	N/A	0.25	0.17	0.24	Oval shaped cut	Cut of posthole
C8	C7	0.25	0.17	0.24	Mid greyish brown sandy silt	Fill of posthole
C9	N/A	0.16	0.12	0.15	Oval shaped cut	Cut of posthole
C10	C9	0.16	0.12	0.15	Mid brown sandy silt	Fill of posthole
C11	N/A	0.49	0.22	0.09	Oval shaped cut	Cut of pit
C12	N/A	0.48	0.20	0.21	Oval shaped cut	Cut of posthole
C13	C12	0.48	0.20	0.21	Mid brownish grey sandy clay	Fill of posthole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C20	N/A	0.29	0.22	0.29	Circular cut	Cut of posthole
C21	C20	0.29	0.22	0.29	Mid brownish(orange hue)soil	Fill of posthole
C22	N/A	0.30	0.22	0.32	Circular cut	Cut of posthole
C23	C22	0.30	0.22	0.32	Mid brownish orange sandy clay	Fill of posthole
C24	N/A	0.20	0.19	0.13	Oval shaped cut	Cut of posthole
C25	C24	0.20	0.19	0.13	Mid brownish orange sandy clay	Fill of posthole
C29	N/A	0.19	0.17	0.15	Oval shaped cut	Cut of posthole
C30	C29	0.19	0.17	0.15	Mid brown sandy silt	Fill of posthole
C31	C11	0.49	0.12	0.09	Yellow brownish sandy silt	Fill of pit
C33	C3	0.21	0.17	0.20	Light brown sandy silt	Fill of posthole

Finds: None

These postholes were clustered in groups within the site. Postholes C20, C22 and C24 were to the north-west, and adjacent to a cluster which incorporated C29, C7, C3, C11, and C9. The final two postholes, C4 and C12, were located to the east of the structure. None of these postholes appeared to be functionally related to the structure and their precise function is unclear.

Charcoal was recovered from the posthole fill C13, C23 and C25 during post-excavation soil flotation and was subsequently identified to species. Ash (*Fraxinus excelsior)* and smaller amounts of hazel *(Corylus avellana)* and cherry-type (*Prunus sp.)* charcoal fragments were identified from C13 (Lyons, Appendix 2.3). Ash (*Fraxinus excelsior)* charcoal fragments were identified from C23 (*ibid.*). Ash (*Fraxinus excelsior)* and smaller amounts of hazel *(Corylus avellana)* charcoal fragments were identified from the posthole fill C25 (*ibid.*). The presence of ash and hazel charcoal from these posthole fills may represent the remains of structural wood, where ash and hazel were the woods of choice used in construction works. Ash was a popular wood used in construction during the prehistoric period while hazel and pomaceous woods were both used in the construction of lighter structures, such as wind breakers and wattling. Due to the low occurrence of Prunus sp. (cherry-type) it is likely to represent the remains of re-deposited charred debris from nearby firing events (*Ibid.*).

2.3 Phase 3: Topsoil and Plough soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A			0.30m	Dark-brown sandy silt	Topsoil and ploughsoil

Finds: None

This represented the topsoil that sealed the subsoil and all archaeological activity on the site

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Ennisnag 1. This includes the analysis of the physical and archaeological landscape, the compilation of information gathered during research into the site type, date, and function, and the results of the excavation and specialist analysis of samples taken during the course of on-site works.

3.1 Landscape Setting – compiled by Michelle Brick

3.1.1 The General Landscape

The topography of the region through which the route passes is generally flat with an average height of 70m O.D. The southern periphery of the route is bordered by Kilmacoliver (261m) and Carricktriss Gorse (314m), with Slevenamon (721m) further west. The Slieveardagh hills (340m) are visible on the western horizon in the south of the route and with the exception of Knockadrina Hill (140m), the enclosed landscape is made up of minor undulations. In the centre of the route Freestone Hill (130m) and Knocknagappoge (334m) further north are the significant uplands. A number of hills and mountains are visible in the distance to the east and west of this area of the landscape but the topography remains generally flat. To the north the Castlecomer Plateau influences a rise in the overall topography of the region. This expanse of terrain stretches along the north-east margins of Kilkenny, crosses the county border into Carlow and stretches northwards into Laois. This plateau consists of a variety of hills and peaks including Mountnugent Upper (334m), Baunreagh (310m), Knockbaun (296m), Brennan's Hill (326m) and Fossy Mountain (330m). These hills contain seams of anthracite coal as a result of millions of years of compression, and consequently Shales and Sandstones were formed which are evident throughout the plateau. Mining in the region began in the 17th century, continued for over 300 years and it is for what Castlecomer is best known. According to the Environmental Protection Agency soil maps of Ireland, the underlying bedrock of the entire region primarily consists of Carboniferous Limestone. However there is also a small amount of surface bedrock, sands, gravels, shales and sandstone Tills present along the route. The soil cover of the region is primarily composed of Grey Brown Podzolics, Renzinas and Lithosols. Additional soil types also present along the route include Brown Earths, surface Water Gleys and Ground Water Gleys.

The prevailing water courses within the landscape of the N9/N10 Phase 4 are the Rivers Nore and Barrow. The River Nore rises on the east slopes of the Devil's Bit in Co. Tipperary and flows eastwards through Borris-in-Ossory and then south through Co. Kilkenny, passing through the towns of Durrow (Laois), Ballyragget, Kilkenny, Bennettsbridge and Thomastown to join the River Barrow upstream of New Ross, Co. Wexford. It is 140 kilometres long and drains a total catchment of 1572 square kilometres and runs through the central and southern sections of the route. In the south of the route three main tributaries of the River Nore are evident. The Kings River flows east through Callan and Kells. It is joined by the River Glory which meanders on a north-south axis towards the western margins of the route landscape and the Little Arrigle River flows along the southern fringes. These rivers are flanked by low-lying valleys that are characterised by wet, marshy land. The condition of the soil improves further north beyond the King's River where the influence of these waterways declines. In the northern area of the route the River Dinin is a tributary of the River Nore flowing south-west from Brennan's Hill through the Castlecomer Plateau. The Plateau is the tableland that is the watershed between the Rivers Nore and Barrow (Lyng 1984). The River Barrow is the second longest river (193 kilometres) in Ireland after the River Shannon. It rises in the Slieve Bloom Mountains in Co Laois and flows east across bogs and lowlands and then turns south into the lowland immediately east of the Castlecomer Plateau. It passes through

Portarlington, Athy, Carlow, and Graiguenamanagh and runs through the northern section of the route. It is joined by the River Nore at New Ross. The Maudlin River is the notable tributary of the River Barrow within the landscape of the route and flows east from Old Leighlin, with minor tributaries of it flowing through Banagagole. There are also streams and minor watercourses present throughout the entire landscape and these waterways would have been a valuable resource to past communities and would also have had a major influence on settlement and the surrounding land use.

The physical landscape through which the N9/N10 Phase 4 passes can be divided into three principal areas defined by the main rivers and their catchments. The southern area is located in the undulating landscape on the western flanks of the Nore Valley. The central area is dominated by the fertile watershed between the Barrow and Nore systems in the hinterland of Kilkenny City. The northern area is located on the western flanks of the Barrow Valley overlooked by uplands to the north and west. Ennisnag 1 is located in the southern landscape area.

3.1.2 The Southern Landscape

This landscape stretches northwards along the valleys of the Little Arrigle and Nore rivers and encompasses the lower reaches of the King's River and the River Glory and principally lies between 60m and 80m OD. It includes 23 sites discovered during the Phase 4 excavations stretching from Baysrath 2 (Baysrath 1 was excavated under a separate archaeological contract) northwards to Ennisnag 2. The Slieveardagh hills (340m) are visible on the horizon along the north-west boundary and with the exception of Knockadrina hill (140m) which is positioned in the centre of the region, the enclosed topography is made up of minor undulations. According to the EPA soil maps of Ireland, the underlying bedrock of the region primarily consists of Carboniferous Limestone although there is some surface bedrock present in the Rathduff (Bayley) and Knockadrina townlands. The soil cover of the region is primarily composed of Grey Brown Podzolics, but in areas where surface bedrock is present the soil is also made up of Renzinas and Lithosols. Within the Nore catchment the terrain remains predominantly wet and soft and the sand and gravel deposits along the river are categorised as a major aquifer in the Kilkenny Groundwater Protection Scheme. Carboniferous limestones, most notably of the Ballysteen formation, dominate and have facilitated the development of the slightly rolling topography. The extensive dolomitisation of parts of the geological formations in this area of the N9/N10 has resulted in the increased permeability of local rocks. The water is discharged via a number of springs, which emerge close to the channels of the Nore and Kings Rivers.

Of note in the south of this landscape is the Danganbeg wetland which encompasses an area of *c*. 6.21km^2 and comprises a young wetland, fed by highly mineralised water through the groundwater and also through seepage springs which are concentrated along a contour range of 62–65m OD. Much of the Danganbeg wetland has been subject to drainage and this has significantly de-mineralised the western sections, where the wetland is flanked by the new N9/N10 road. An area of alkaline fen and swamp flora is present and the ground is soft. The terrain rises to Knockadrina Hill (140m) which is, and as it probably was in prehistory and during the medieval period, an important local reference point and scenic focus. Its vegetation comprises broadleaf woodland including mature beech as well as ash, sycamore, hawthorn, and holly, and there is a pond at the base of the woodland, to the south along with a small spring. The adjacent townland of Stonecarthy consists predominantly of wet grassland, scattered pools, and scrub with areas of improved grassland. The land then slopes down through small copses of mature trees and broadleaf woodland before reaching the Kings River at 50m OD. From the Kings River the topography varies little and does not rise above 80m again. The quality of

the land is high in this area as the glacial characteristics are dominated by the Butlersgrove formation (a grey, well-bedded muddy limestone interbedded with calcareous shales) which also extends into the hinterland of Kilkenny City. In this area the glacial drift comprised sandy (60–80%) gravelly clays of low plasticity and a natural moisture content of 7–15%. The Ennisnag Stream Valley provides an extra water source while the townland of Croan, wherein a pond with silty substrates supports rushes and aquatic species, indicates the potentially wet nature of the area.

3.1.3 Site Specific Landscape

Ennisnag 2, AR074, was found on the eastern slopes of a hill overlooking a river valley. The river is a small tributary that transports water to the King's River at Ennisnag from the Slieveardagh Hills located 18km north-west of the site. This particular point of the river valley appears to have been important in prehistory and early medieval times because multi-period sites Danesfort 12 and Danesfort 13 and *fulacht fiadh* Danesfort 2 were found in the valley and four ringforts are recorded on its surrounding hills (RMP sites KK023-076–079; Figure 2). While a hedgerow obstructed the view of the Slieveardagh Hills from the site, the North Kilkenny hills were visible 12km to the north, the Booley Hills 20km to the south, and the Blackstairs Mountains 33km to the east. All appeared low on the horizon and indistinctive. The view to the south-east extended only as far as the opposite side of the valley, where RMP KK023-080, ringwork with a folly/ turret on top, is located on a small hill (see Plate 1).

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Ennisnag 1, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record of Monuments and Places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the N9/N10 Phase 4 scheme. The excavated archaeology at Ennisnag 1 has been identified as being Neolithic in date.

3.2.1 The General Neolithic Landscape of the Scheme – compiled by Michelle Brick

The Neolithic period in Ireland is generally understood to have occurred between 4000BC–2500BC. Archaeological evidence directly associated with settlement during this period had - prior to the upsurge in development-led excavations - been rather sparse in Kilkenny and Carlow as the soils in these areas may have been too heavy for Neolithic farming technology (Grogan 2004). However, recent excavations on the Waterford to Knocktopher portion of the N9/N10 Kilcullen to Waterford Road Scheme in south Kilkenny, as well as the rectangular houses discovered on the Kilcullen to Powerstown portion of the same road scheme in Co. Carlow, have added further insight into the Neolithic settlement of the region. Prior to the N9/N10 excavations archaeological activity in the Kilkenny/Carlow region was predominantly represented by a limited number of burials or tombs, most of which are Neolithic in date, such as the middle Neolithic megalithic tombs at the eponymous site of Linkardstown and at Baunogenasraid, Co. Carlow and Jerpoint West, Co. Kilkenny (Raftery, 1944; Raftery, 1972; 1974; Ryan 1974;).

The Southern Neolithic Landscape

In the southern landscape Neolithic occupation is represented by a variety of megalithic tombs and settlements. In the more upland areas various monument types have been recorded, for example a court tomb at Farnoge (de Valera and Ó Nualláin 1962) and the portal tombs at Ballylowra (KK032-009), Glencloghlea (KK037-023),

Kilmogue (KK035-087), Newmarket (KK031-031) and Raheen (KK039-044). Early Neolithic activity is also represented by two rectangular houses excavated at Kilkeasy (Monteith 2007a) and a cremation pit excavated at Baysrath (Channing 2007) in the region. Two rectangular houses were also excavated at Earlsrath (McKinstry 2007) and late Neolithic occupation evidence came from Scart 1, represented by an important Grooved Ware settlement and ritual complex (Monteith 2007b; Laidlaw 2008; Grogan and Roche 2007; 2008). The final Neolithic/Beaker period, distinguished principally by contexts associated with Beaker pottery, had not previously been identified in the region apart, potentially, from the two wedge tombs at Ballymartin (KK040-137) and Ballylowra (KK032-010). Beaker activity has also been recorded at Baysrath of late (Channing 2007).

In the southern landscape excavations on the current scheme revealed a small structure at Knockadrina 2. This consisted of a loose northwest–southeast arrangement of a slot-trench and six postholes. These features produced pottery sherds from seven early Neolithic carinated bowls, three flints, a piece of worked chert and two stone beads. A similar site was also excavated to the north of the King's River; evidence at Ennisnag 1 indicated a possible temporary structure (5.5m by 5.2m) consisting of a north–south slot-trench and four postholes. Sherds from at least two early Neolithic carinated bowls and flint debitage came from the slot. Small quantities of early Neolithic pottery also came from Tinvaun 2 while other distinctive material of this period includes a polished stone axe fragment from Danganbeg 1. The lithic evidence at Danganbeg 1 and Tinvaun 2 was associated with pits and suggests small-scale, short term activity. However, Knockadrina and Ennisnag which both produced evidence for structures might well be on the edge of more extensive settlement sites. At least episodic activity, represented by sherds from a globular bowl, continued at Knockadrina into the middle Neolithic. Additionally two pits at Tinvaun 1 were dated to 2457–2202BC and 2459–2205BC (UBA 10991 and UBA 10992, respectively) indicating final Neolithic/ early Bronze Age activity.

Conclusion
The broad regional pattern in the Neolithic indicates two core areas of settlement. In the north-east there is a concentration of activity along the upper Barrow Valley extending from the Goresbridge area northwards along the Barrow and the valley of the Burren River. This continued to be an important area into the middle and late Neolithic and the activity at Ballynolan 1 is on the southern edge of this landscape. To the south-west, on the upland fringes between the Nore and Suir Valleys, a second settlement concentration may reflect route-ways along the lower Nore/Barrow and Suir extending southwards towards the coast at Waterford. The central areas within the current scheme, consisting of lower lying terrain, appear not to have been attractive in this early period possibly a reflection of the heavier, and perhaps more thickly afforested, soils. Expansion into this landscape is, however, indicated by the Grooved Ware and Beaker contexts at Templemartin 5, Paulstown 2 and Danesfort and this heralds more intensive settlement in the Bronze Age.

3.2.2 The Site Specific Archaeological Landscape of Ennnisnag 1

There are a number of recorded monuments in the vicinity of Ennisnag 1. An earthwork (KK027-004) is recorded, *c*. 300m to the east and *c*. 250m to the north of Ennisnag 1 a ringfort (KK023-078) is recorded. Further to the north, two ringforts (KK027-076–77) are also recorded, *c*. 550–650m away and to the north-west, *c*. 650m away, a holy well (KK023-075) is recorded. An additional ringfort (KK027-005) is also located *c*. 800m to the south-east.

There were no archaeological excavations to the immediate south of Ennisnag 1 as part of the N9/N10 Phase 4: Knocktopher to Powerstown scheme. The closest site

was at Kellsgrange 3, located *c*. 1.7km to the SSW, where nine early medieval cereal drying kilns and three associated postholes were excavated.

To the north of Ennisnag 1, a number of sites were excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown scheme. At Danesfort 12, located *c*. 500m to the north-east, multiple periods of activity were excavated. These consisted of a possible late Neolithic temporary structure, an early Bronze Age pit circle, a middle Bronze Age industrial complex and two late Bronze/Iron Age ringditches and cremation pits. Also excavated was an iron working furnace probably dating to the early medieval period and a rectangular ditch enclosure. Further to the north-east, *c*. 720m away at Danesfort 13, Iron Age and early medieval activity was recorded. The Iron Age archaeology primarily consisted of a ringditch and a cremation pit. The early medieval phase consisted of a field boundary ditch and a metalworking area that included a charcoal-production kiln, a furnace and a possible forging area.

3.3 Typological Background of Temporary Prehistoric Structures

The rise in development lead archaeological excavations in recent years has resulted in the identification of many smaller and ephemeral features which now make up a substantial portion of the archaeological record in addition to the larger, well documented site types. This is also true on the N9/N10 Phase 4: Knocktopher to Powerstown where a number of sites have been interpreted as Temporary Structures. These structures generally present as small slot trenches, alignments of small numbers of postholes, clusters of stakeholes or combinations of all three elements. There are usually not enough definitive elements such as formal entrances and roof supports to identify a specific building type - as with Neolithic or Bronze Age houses. Temporary structures are more likely to represent transient settlement and would probably have been in use for a very short time as there is often no evidence of domestic habitation in the form of artefacts or waste material. Along the N9/N10 these structures have been dated to the Neolithic and Bronze Age periods. To date no definitive study has been carried out to assimilate the results from the many excavations across the country over the past 2 decades so there is no detailed research into variances between periods and typology

3.4 Summary of the Excavation Results

The site was found just off the brow of a hill, on a north-easterly slope that overlooked a small stream to the east. The most significant feature on the site was a linear slot-trench that measured 3.75m by 0.25m by 0.10m. Twelve small sherds of Neolithic carinated bowl were found within the brown sandy silt fill of the slot-trench. Four possible postholes with diameters ranging from 0.18m to 0.35m and depths from 0.13m to 0.27m were found close to the slot-trench. The slot-trench and the postholes possibly formed a temporary structure *c.* 3m by 4m in size, although radiocarbon dating evidence suggests that they may not be contemporary. Ten further pits / postholes were found within the 25m^2 excavation area but none conformed to any obvious structural pattern. The site may represent a temporary camp site.

3.5 Summary of the Specialist Analysis

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

Prehistoric pottery analysis

The site at Ennisnag 1 produced eight sherds (plus five fragments, weight: 28g) representing two early Neolithic carinated bowls. The pottery is well-fired and little

worn with mainly fresh surfaces and edge breaks. All of the material has quartzite inclusions. The fabric and inclusions indicate that the material represents the earliest type of Neolithic pottery in Ireland which is widely dated to *c.* 4000–3700 BC

Lithics analysis
The lithic finds from the archaeological excavation at Ennisnag 1, Co. Kilkenny are a piece of flint debitage and a piece of quartz crystal debitage. The debitage pieces most likely date to the Neolithic or early Bronze Age period.

The lithic assemblage of the site makes makes a minor contribution to the evidence for prehistoric settlement in Co. Kilkenny.

Charcoal and Wood Species identification
Five wood species were recorded from the site (ash, hazel, oak, pomaceous woods and cherry-type). Since the samples were confined to structural deposits (postholes and a slot trench), it is possible that the charcoal remains recovered represent some of the woods used in construction works at the site. The preponderance of ash and hazel suggests that they were the woods of choice in construction methods at the site. The much lower occurrence of oak, pomaceous woods and cherry-type, while they may have been part of the construction materials, may also have entered these features inadvertently as re-deposited charred debris from nearby hearths or firing events.

Analysis of Plant Remains
The only plant remains found were the charred fragments of hazelnut shells. The small quantities of remains recovered suggests that these are relatively insignificant indicators of diet and plant use at the site

Radiocarbon Dating
A total of two samples were sent for AMS radiocarbon dating.

A sample of Ash charcoal from slot-trench fill C32 was sent for radiocarbon dating and returned a 2 sigma calibrated date of 3518–3368BC (UBA 15544)

A sample of hazelnut shell from posthole fill C35 was sent for radiocarbon dating and returned a 2 sigma calibrated date of 3941–3696BC (UBA 15545)

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The site has produced evidence of a possible temporary shelter and associated pits and a hearth. The site is located on slightly higher ground that overlooks a small stream to the north-east which is prone to flooding in wet weather. Its location overlooking the stream is ideally located as a temporary camp/settlement site.

There are no previously recorded monuments in the immediate vicinity that would date to the prehistoric period. The monuments in the vicinity consist of ringforts and a holy well which would all date to the early medieval period or later. In this regard the identification of the site was unexpected.

Ennisnag 1 has been interpreted as a temporary structure/shelter. It is likely that this represents a transient activity on site and is not related to a longer term settlement. This is evident in the nature of the remains which are not substantial enough to be considered as a formal Neolithic house. The slot-trench may have held a series of upright half-split timber posts, with the two posts at either end of the slot supporting this. The two posts parallel to trench may have added a counter-support to the entire structure. This could then have been covered by skins/hides or scrub effectively acting as a windbreak. This structure may also have been similar to a bivouac - a shelter constructed of natural materials like a structure of branches to form a frame may be utilised. This would then covered with leaves, ferns and similar for waterproofing and duff (also known as *leaflitter*) for insulation (Wikipedia). Until comparative examples are researched this interpretation must be considered speculative.

The site was confirmed as being dated to the early Neolithic through radiocarbon dating of two samples. The samples however have not returned completely contemporary results which suggest that there is a possibility of two separate phases of activity at the site. On the surface it would seem unlikely that given the small number of features uncovered they would represent two distinct phases of activity, but it is possible that the postholes represent a later phase to the slot-trench.

The lithic assemblage from the site is unremarkable and Sternke states that it makes only a minor contribution to our understanding of the Neolithic in the region. The presence of sherds of Neolithic carinated bowl is however more interesting and significant. These confirm the radiocarbon dating indications that the site was in use in the early Neolithic period but more importantly may give an insight into the possible nature of the settlement on the site. Firstly, we must question the validity of the original interpretation of the site as a temporary campsite. It seems more likely that pottery remains would be associated with a more permanent settlement; however the archaeological record for the site does not support a more substantial settlement or occupation. The pottery shows evidence of fresh breaks and this indicates that there may have been ritual deposition of the freshly broken sherds. It is noticeable that all of the finds from the site were located within the fills of the slot trench. We have discussed above that radiocarbon dating results suggest that there may have been two phases to the site – with a slightly earlier date returned for the slot trench than the postholes. The distribution of the finds may support the two phase theory as no artefacts were recovered from any of the postholes.

The excavations along the route of the N9/N10 Phase 4: Knocktopher to Powerstown have identified Neolithic activity nearby at Danesfort 12 but this has been dated to the middle-late Neolithic and is not contemporary with either of the dates retrieved for

Ennisnag 1. Contemporary activity was recorded at Danesfort 5 (from a pit) and from Danesfort 7 2.8km to the north-east and it is likely that these represent activities by the same broad community who are likely to have had a more permanent settlement in the area.

4.2 Conclusions

The site has produced evidence of a possible temporary shelter dated to the early Neolithic. Two possible phases, indicated by radiocarbon dating, and the presence of freshly broken sherds of carinated bowl within the slot-trench suggest that the site may have had a more ritual significance to the early Neolithic community. The site is of local importance as it represents the first evidence of early prehistory in the immediate area. The site is of regional importance as together with the results of other excavations along the N9/N10 Phase 4: Knocktopher to Powerstown it has widened our knowledge of the nature and distribution of early Neolithic settlement.

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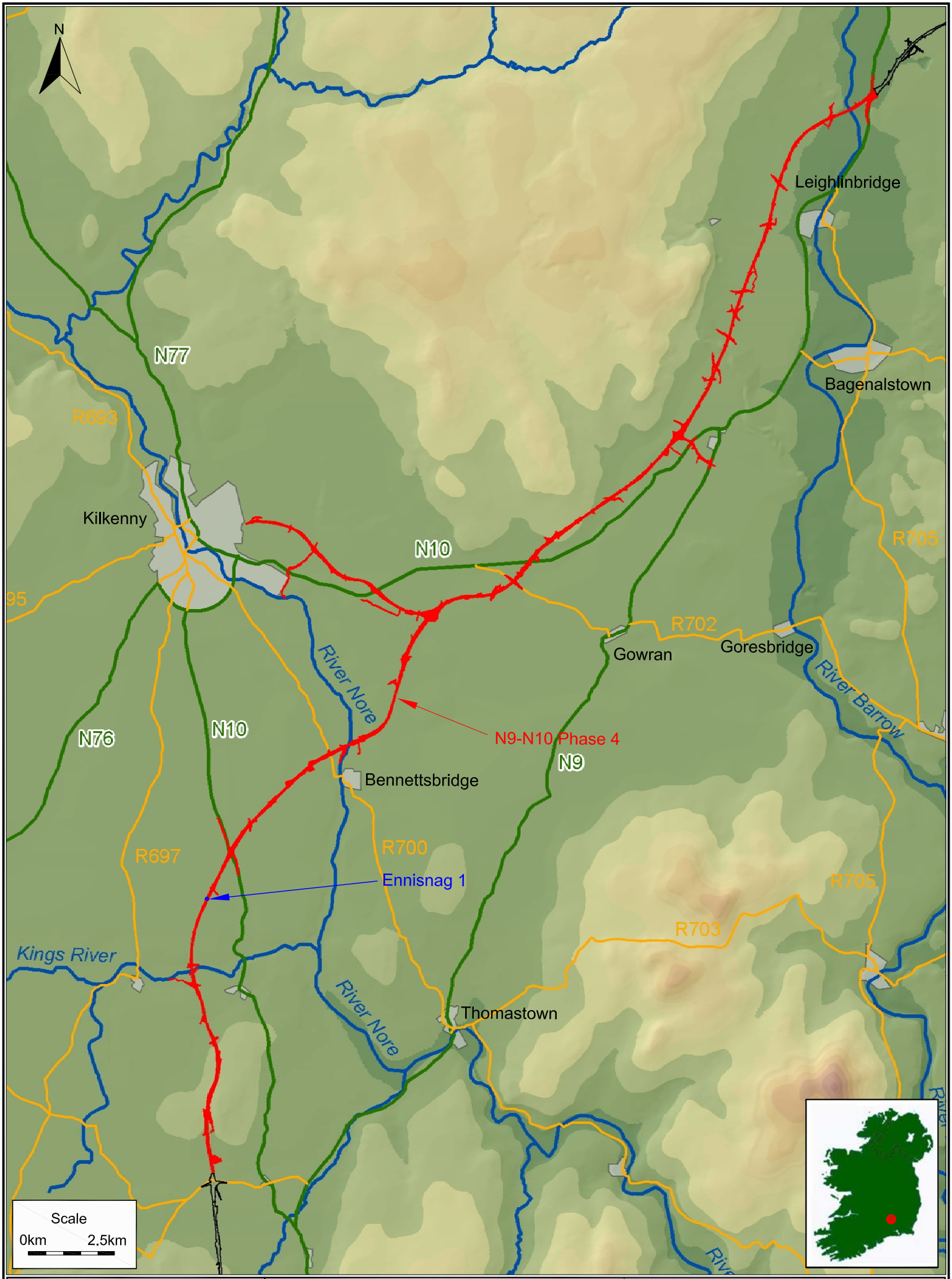

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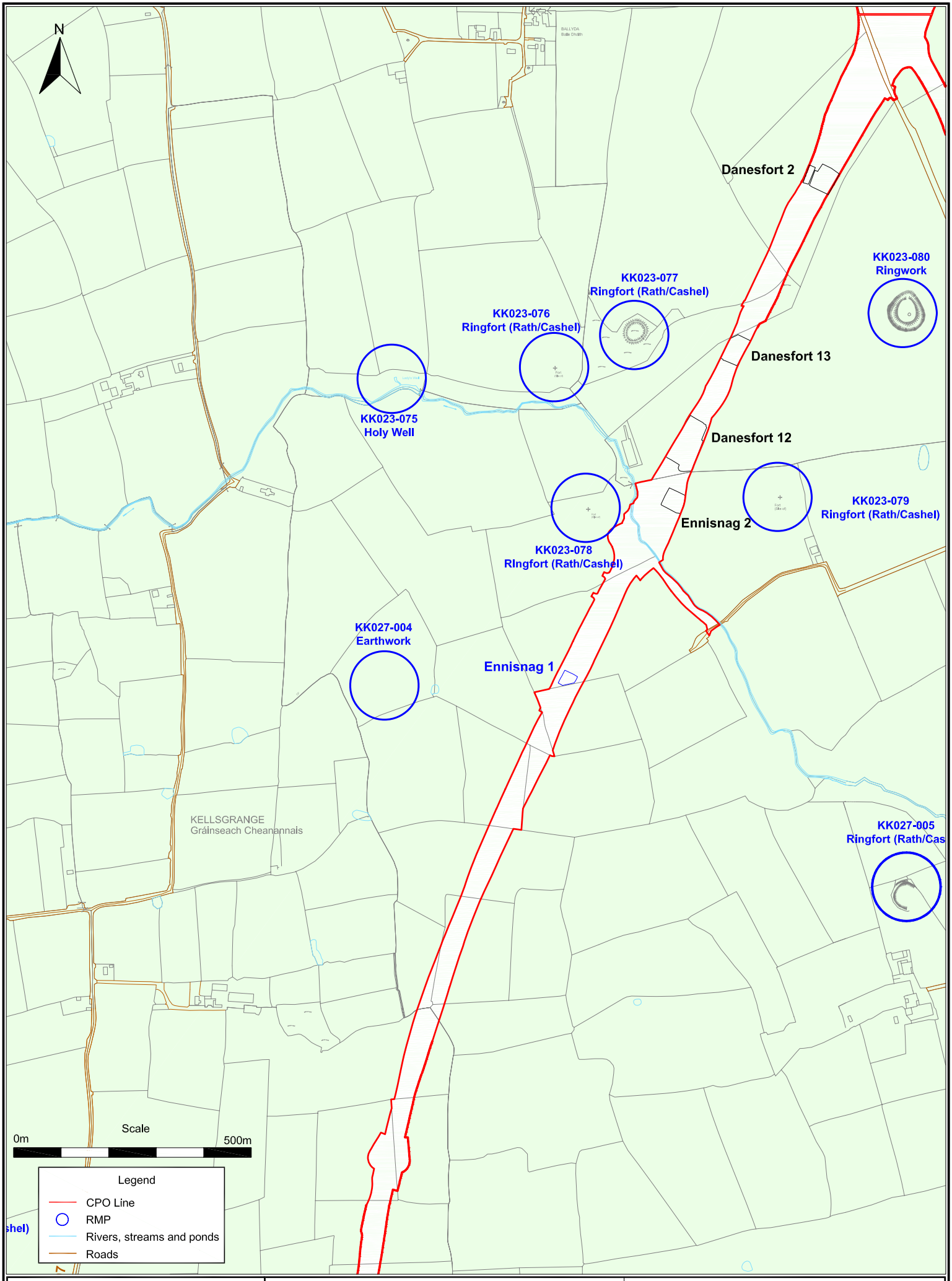

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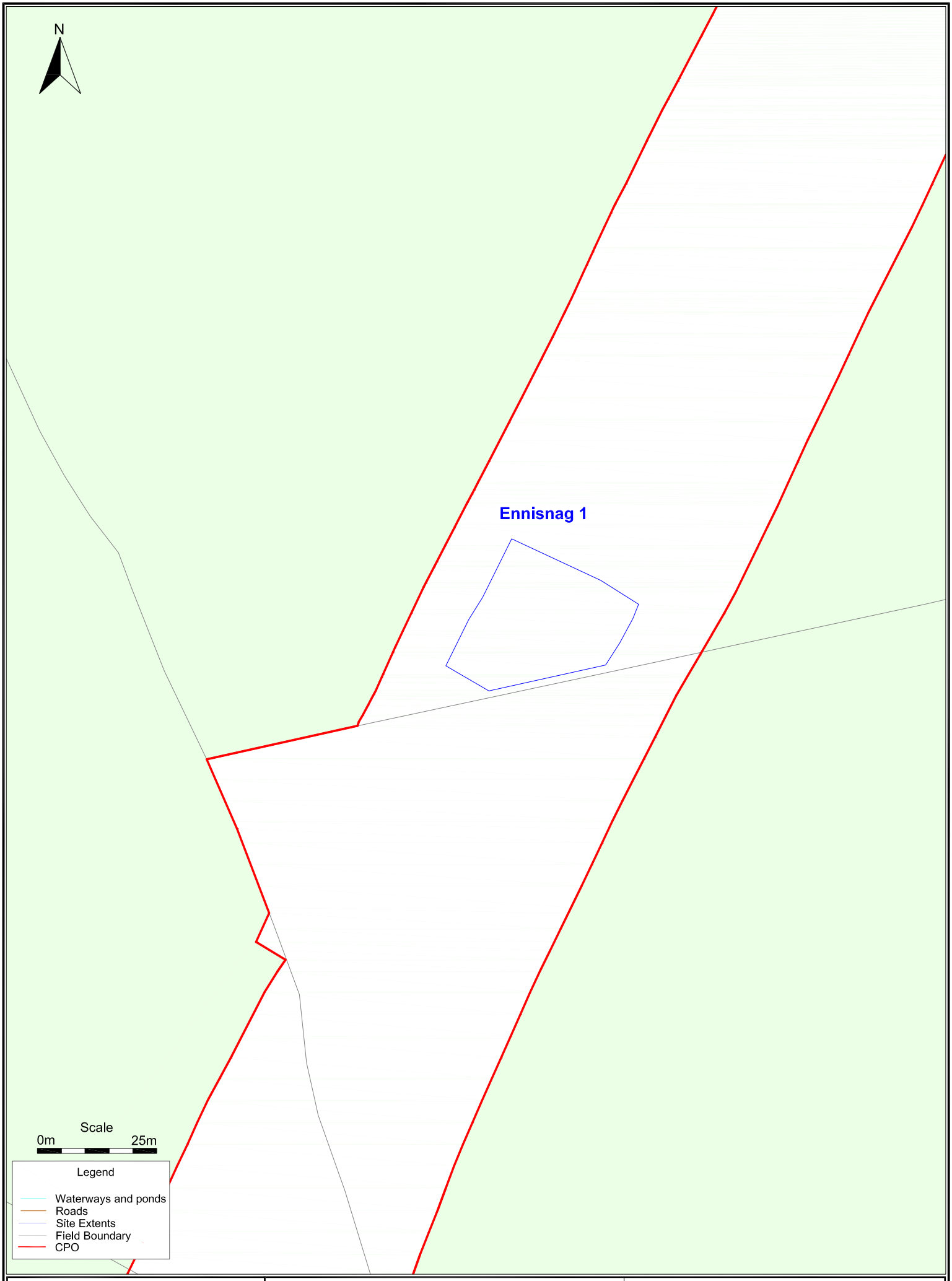

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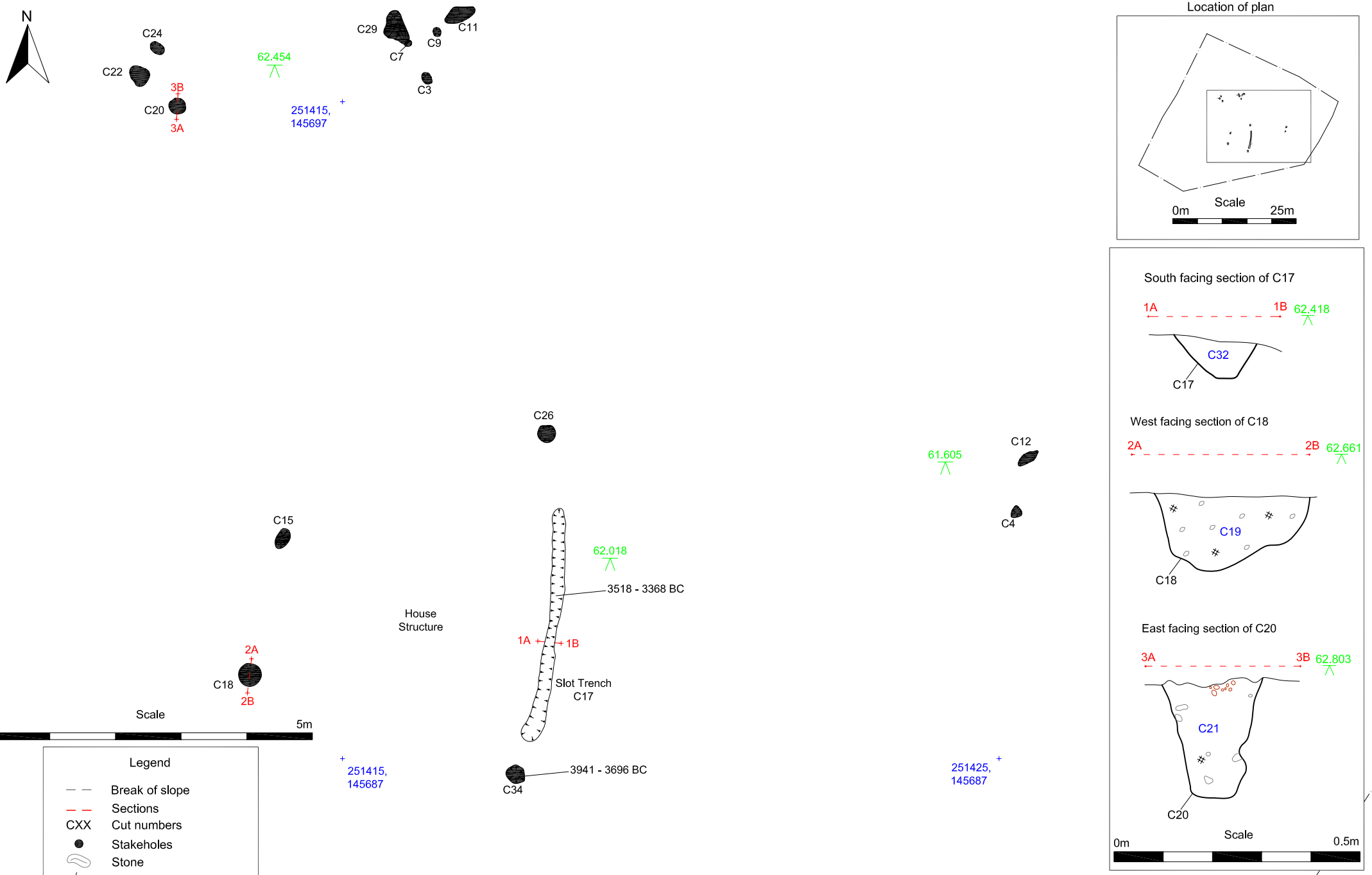

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Project:	N9-N10 Phase 4: Knocktopher to Powerstown
Client:	Kilkenny County Council

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Figure No:	4

PLATES

Plate 1: An elevated view of Ennisnag 1, facing east.
(RMP KK023-080 (ringwork with folly/ turret) is located on the hilltop in right background and sites Danesfort 12, Danesfort 13 and Danesfort 2 are centre left.)

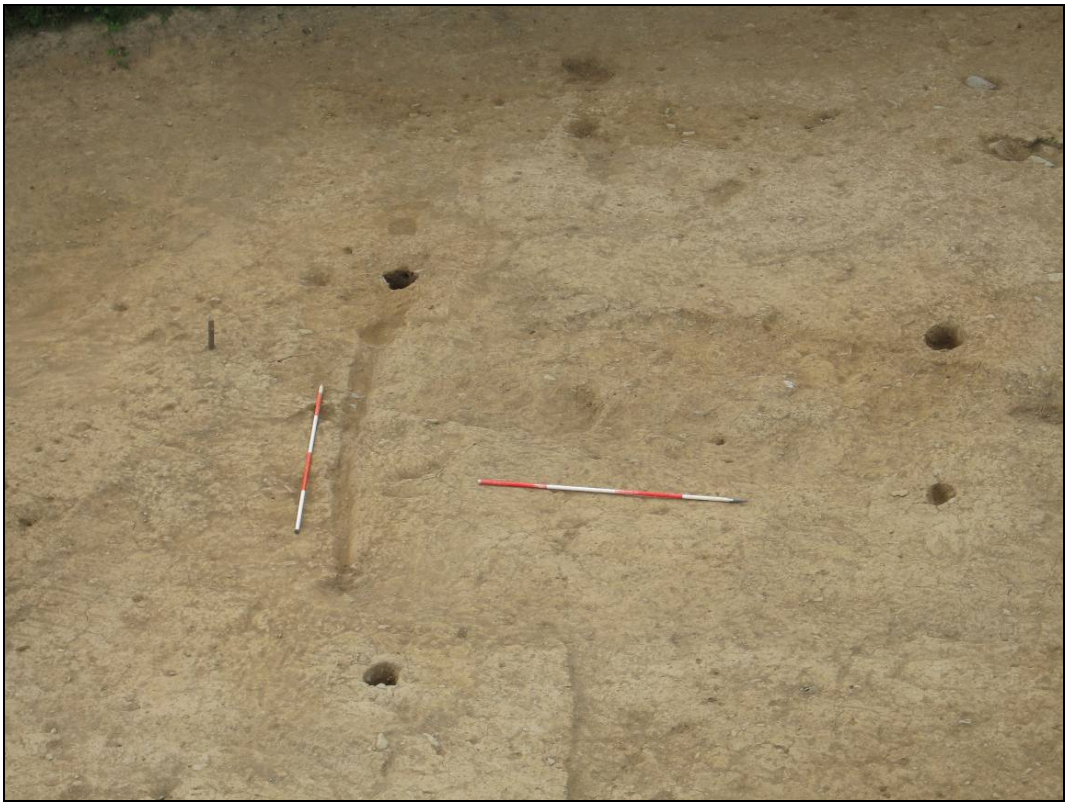

Plate 2: Prehistoric structure, post-excavation, facing south

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
1	N/A				Topsoil	Mid brown sandy silt	C33	C2
2	N/A				Natural	Light yellowish brown sandy clay with common gravel elements	C5	C2
3	N/A	0.21	0.17	0.20	Fill of posthole	Mid brown soil, loose compaction, infrequent charcoal and occasional small stones	C6	C4
4	N/A	0.14	0.16	0.11	Fill of posthole	Irregular, loosely compacted, orange burnt clay	C1	C5
5	C4	0.15	0.16	0.07	Cut of posthole	Oval shaped, gradual break of slope, sloping sides and concave base	C8	C2
6	C4	0.14	0.16	0.30	Fill of posthole	Oval shape, firm compaction, mid greyish-brown, sandy silt with very occasional charcoal and pebbles inclusions.	C1	C7
7	N/A	0.25	0.17	0.24	Cut of posthole	Oval shape, Gradual break of slope-top and base. Sharp sides with pointed base.	C10	C2
8	C7	0.25	0.17	0.25	Fill of posthole	Oval shape. Firm compaction. Mid-brown sandy-silt with 2% charcoal inclusions.	C1	C9
9	N/A	0.16	0.12	0.15	Cut of posthole	Oval shaped, sharp break of slope-top, gradual break of slope-base, vertical sides and concave base	C33	C2
10	C9	0.16	0.12	0.15	Cut of posthole	Irregular shape, gradual break of slope, steep sharp sides, concave base	C5	C2
11	N/A	0.49	0.22	0.09	Cut of pit	Oval shape. Gradual break of slope-top, sharp sides, steep break of slope-base, uneven base	C31	C2
12	N/A	0.48	0.20	0.21	Cut of posthole	Oval shape. Gradual break of slope - top and base. Sloping sides, concave base.	C13	C2
13	C12	0.48	0.20	0.21	Fill of posthole	Oval shape, loose compaction mid-brownish grey sandy clay with burned clay 1% and charcoal >3% inclusions.	C1	C12
14	N/A	0.66	0.20	0.10	Deposit	Irregular shape, firm compaction, brownish clay with charcoal 1% inclusions	C1	C2
15	N/A	0.18	0.17	0.13	Cut of posthole	Oval shape. Gradual break of slope - top and base, straight sides, U-shaped base	C16	C2
16	C15	0.18	0.17	0.13	Fill of posthole	Oval shape. Middle compaction. Mid-brownish clayey silt with charcoal 5% inclusions.	C1	C15
17	N/A	3.75	0.25	0.10	Cut of linear feature	Linear SW-NE orientation. Gradual break of slope - top and base, concave sides and concave base.	C32	C2
18	N/A	0.35	0.33	0.20	Cut of posthole	Sub-circular shape. Gradual break of slope - top and base, concave sides with U-shaped base.	C19	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
19	C18	0.35	0.33	0.20	Fill of posthole	Rounded shape. Firm compaction, mid-brown silty clay with inclusions of charcoal 15%.	C1	C18
20	N/A	0.29	0.22	0.29	Cut of posthole	Circular shape. Flat break of slope at top, steep sloped sides, gradual break of slope at base, concave base.	C21	C2
21	C20	0.29	0.22	0.29	Fill of posthole	Circular shape. Dense compaction, mid-brownish orange hue. Clear soil consistency. Some large pieces of charcoal near surface and one piece of burned clay near charcoal	C1	C20
22	N/A	0.30	0.22	0.32	Cut of posthole	Circular shape. Slight break of slope at top. Sloping sides. Gradual break of slope at base, concave base.	C23	C2
23	C22	0.30	0.22	0.32	Fill of posthole	Circular shape. Firm compaction, mid-brownish orange sandy clay. Clean consistency. Several small stones and infrequent charcoal inclusions.	C1	C22
24	N/A	0.20	0.19	0.13	Cut of posthole	Oval, slight break of slope-top. W side vertical, NE side sloping. Gradual break of slope at base, concave base.	C25	C2
25	C24	0.20	0.19	0.13	Fill of posthole	Oval shape. Firm compaction. Mid-brown orange sandy clay with infrequent charcoal inclusions.	C1	C24
26	N/A	0.28	0.28	0.18	Cut of posthole	Circular. Sharp break of top slope and base, vertical sides with flat base.	C27	C2
27	C26	0.28	0.28	0.10	Bottom fill of posthole	Circular. Soft compaction, mid-brown colour, silty clay consistency.	C28	C26
28	C26	0.28	0.28	0.15	Top fill of posthole	Circular. Soft compaction, mid-brown colour, silty clay consistency rich in charcoal	C1	C27
29	N/A	0.19	0.17	0.15	Cut of posthole	Oval shape. Gradual break of slope - top and base, sloping sides to concave base.	C30	C2
30	C29	0.19	0.17	0.15	Fill of posthole	Oval shape. Firm compaction. Mid-brown sandy silt with occasional charcoal inclusions.	C1	C29
31	C11	0.49	0.22	0.09	Fill of pit	Oval shape. Firm compaction. Yellow-brown sandy-silt with 3% charcoal and 5% small pebble inclusions.	C1	C11
32	C17	3.75	0.25	0.10	Fill of linear feature	Linear (slightly curving) SW-NE orientation. Dark-brown sandy silt with 1-2% charcoal inclusions.	C1	C17
33	C3	0.21	0.17	0.20	Fill of posthole	Oval shape. Firm compaction. Light-brown sandy-silt with 4% charcoal inclusions.	C1	C3
34	N/A	0.28	0.28	0.23	Cut of posthole	Circular W-E orientation. Sharp break of slope - top, gradual break of slope-base. Concave base and sides.	C35	C2
35	C34	0.28	0.28	0.23	Fill of posthole	Circular W-E orientation. Soft mid-brown silty clay with frequent charcoal inclusions.	C1	C34

Appendix 1.2 Catalogue of Artefacts

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3614:032:1	32	1	Debitage	Quartz crystal debitage	Quartz crystal	Quartz crystal debitage	N/A
E3614:032:2	32	2	Debitage	Flint debitage	Flint	Flint debitage	N/A
E3614:032:3	32	3	Bowl	Bodysherd of early Neolithic carinated bowl	Ceramic	A bodysherd of early Neolithic carinated bowl	N/A
E3614:032:4	32	4	Bowl	Bodysherd of early Neolithic carinated bowl	Ceramic	A bodysherd of early Neolithic carinated bowl	N/A
E3614:032:5	32	5	Bowl	Bodysherd of early Neolithic carinated bowl	Ceramic	A bodysherd of early Neolithic carinated bowl	N/A
E3614:032:6	32	6	Bowl	Bodysherd of early Neolithic carinated bowl	Ceramic	A bodysherd of early Neolithic carinated bowl	N/A
E3614:032:7	32	7	Bowl	Bodysherd of early Neolithic carinated bowl	Ceramic	A bodysherd of early Neolithic carinated bowl	N/A
E3614:032:8	32	8	Bowl	Necksherd of early Neolithic carinated bowl	Ceramic	A necksherd of early Neolithic carinated bowl	N/A
E3614:032:9	32	9	Bowl	Bodysherd of early Neolithic carinated bowl	Ceramic	A bodysherd of early Neolithic carinated bowl	N/A
E3614:032:10	32	10	Bowl	Necksherd of early Neolithic carinated bowl	Ceramic	A necksherd of early Neolithic carinated bowl	N/A
E3614:032:11-15	32	11	Bowl	Fragment of early Neolithic carinated bowl	Ceramic	A fragment of early Neolithic carinated bowl	N/A

Appendix 1.3 Catalogue of Ecofacts

During post excavation works specific samples were processed with a view to further analysis. A total of six soil samples were taken from features at Ennisnag 1 and all samples were processed by flotation and sieving through a 250µm mesh. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	charred seeds	burnt animal bone	animal bone	human bone	burnt human bone	other
C13	1	Fill of posthole	3.3g						
C23	3	Fill of posthole	0.5g						
C25	4	Fill of posthole	2.9g						
C28	2	Top fill of posthole	2.8g						
C32	5	Fill of linear feature	4.0g	0.1g					
C35	6	Fill of posthole	2.4g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: Ennisnag 1		
Excavation registration Number E3614		
Site director: Richard Jennings		
Date: September 2010		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	3	1 pre-ex, 2 post-ex 2 section sheets
Site sections, profiles, elevations	2	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books		
Site registers (folders)	1	
Survey/levels data (origin information)		
Context sheets	35	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	37	
Photographs (print)	0	
Photographs (slide)	0	
Security copy of archive	Yes	Digital copy

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Prehistoric Pottery Report – Eoin Grogan and Helen Roche

N9/N10 Knocktopher to Powerstown

THE PREHISTORIC POTTERY FROM ENNISNAG 1, CO. KILKENNY
(AR074, E3614)

Eoin Grogan and Helen Roche
April 2009

Summary
The site at Ennisnag 1 produced eight sherds (plus five fragments, weight: 28g) representing two early Neolithic carinated bowls.

Context
All of the pottery came from the fill (**32**[1]) of a slot trench (**17**) that formed part of a possible structure (Jennings 2008).

The early Neolithic pottery
The site produced eight sherds (two neck- and six bodysherds, plus five fragments, weight: 28g) representing two early Neolithic carinated bowls (Groups I–II)[2]. The pottery is well-fired and little worn with mainly fresh surfaces and edge breaks. All of the material has quartzite inclusions.

The fabric and inclusions indicate that the material represents the earliest type of Neolithic pottery (Case 1961: 'Dunmurry-Ballymarlagh styles'; Sheridan 1995: 'classic' carinated bowls) in Ireland which is widely dated to *c.* 4000–3700 BC. Recent discoveries of early Neolithic pottery at, for example, Danesfort 5, Knockadrina 2, Baysrath, Earlsrath, Kilkeasy and Scart, have extended our understanding of settlement in the mid to south Kilkenny region (Devine and Zimny 2008; Kyle 2009; McKinstry 2007; Laidlaw 2008; Monteith 2007a; 2007b; Grogan and Roche 2009a–b; 2008a–e; 2007).

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Devine, E and Zimny, P 2008 AR082 Danesfort 5 (E3456), Archaeological Resolution Report, N9/N10 Kilcullen to Waterford Scheme. Phase 4: Knocktopher to Powerstown. Unpublished Interim report on behalf of Kilkenny County Council, Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2007 The prehistoric pottery assemblage from Scart 1, Co. Kilkenny (E3001). Unpublished Report for V J Keeley Ltd.

Grogan, E and Roche, H 2008a The prehistoric pottery assemblage from Baysrath, Co. Kilkenny (E2517). Unpublished Report for V J Keeley Ltd.

Grogan, E and Roche, H 2008b The prehistoric pottery assemblage from Earlsrath, Co. Kilkenny (E3005). Unpublished Report for V J Keeley Ltd.

Grogan, E and Roche, H 2008c The prehistoric pottery assemblage from Earlsrath, Co. Kilkenny (E2510). Unpublished Report for V J Keeley Ltd.

Grogan, E and Roche, H 2008d The prehistoric pottery assemblage from Scart North, Co. Kilkenny (E3021). Unpublished Report for V J Keeley Ltd.

Grogan, E and Roche, H 2008e The prehistoric pottery assemblage from Kilkeasy, Co. Kilkenny (E3014). Unpublished Report for V J Keeley Ltd.

[1] Throughout this report context numbers are in **bold**.
[2] Group numbers (Roman numerals) refer to sherds from a vessel where the overall form is not identifiable.

Grogan, E and Roche, H 2009a The prehistoric pottery assemblage from Danesfort 5, Co. Kilkenny (AR082, E3456). N9/N10 Knocktopher to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009b The prehistoric pottery assemblage from Knockadrina 2, Co. Kilkenny (AR068, E3611). N9/N10 Knocktopher to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

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Kyle, J 2009 AR068 Knockadrina 2 (E3611), Archaeological Resolution Report, N9/N10 Kilcullen to Waterford Scheme. Phase 4: Knocktopher to Powerstown. Unpublished Interim report on behalf of Kilkenny County Council, Irish Archaeological Consultancy Ltd.

Laidlaw, G 2008 Preliminary report on excavations at Scart North, Co. Kilkenny (E3021). N9/N10 Dunkitt to Sheepstown. Unpublished Report for V J Keeley Ltd.

McKinstry, L 2007 Preliminary report on excavations at Earlsrath, Co. Kilkenny (E3005). N9/N10 Dunkitt to Sheepstown. Unpublished Report for V J Keeley Ltd.

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Sheridan, A 1995 Irish Neolithic pottery: the story in 1995. In I Kinnes and G. Varndell (eds), '*Unbaked Urns of Rudely Shape*', 3–21. Oxbow Monograph **55**, Oxford.

CATALOGUE

The excavation number E3614 is omitted throughout: only the context number, in **bold**, followed by the find number is included (e.g. **32**:8). The thickness refers to an average dimension; where relevant a thickness range is indicated. Vessel numbers have been allocated to pottery where some estimation of the form of the pot is possible, or where the detailed evidence of featured sherds (e.g. rims, shoulders), decoration or fabric indicates separate pots. Group numbers (Roman numerals) refer to sherds from a vessel where the overall form is not identifiable principally due to the absence of sufficient feature (rim/ neck/ shoulder) sherds. While this generally indicates separate pots due to the nature of the material is it possible that some Vessel Groups may represent portions of vessels otherwise identified by Vessel Numbers. Individual sherds that could not be definitely ascribed to either category are described separately; these may come from further pots that are not, however, included in the calculations of minimum and maximum numbers of vessels. Fragments are very small pieces, generally measuring less than 10 x 10mm, or where only one surface is preserved. The inclusions were examined using simple magnification and in some cases attribution reflects probable, rather than certain, identification.

Early Neolithic carinated bowls

House structure: fill 32 of slot trench 17
Group I. This is represented by 5 sherds (1 necksherd: **32**:8; 4 bodysherds: **32**:4–7) of red-brown fabric with dark red-brown surfaces; the outer is smooth and burnished. There is a medium content of quartzite inclusions (≤ 2 x 1mm, up to 2.9 x 2.5mm). Neck thickness: 4.61mm; body: 5.55mm; weight: 14g.

Group II. This is represented by 3 sherds (1 necksherd: **32**:10; 2 bodysherds: **32**:3, 9; 5 fragments: **32**:11–15) of red-brown fabric with a dark red-brown outer surface. There is a medium content of quartzite inclusions (≤ 2 x 1mm, occasionally up to 3.2 x 2.8mm). Neck thickness: *c.* 5.19mm; body: 4.78–6.71mm; weight: 14g.

Vessel No.	Context/feature	Number of sherds	Rimsherds	Necksherds	Shouldersherds	Bodysherds	Fragments	Inclusions	Vessel size (mm)	Weight (g)	Pottery type	Burnished
Group I	32	5	0	1	0	4	0	Q	-	14	ENCB	■
Group II	32	3	0	1	0	2	5	Q	-	14	ENCB	-
Total		***8***	***0***	***2***	***0***	***6***	***5***			***28***	***ENCB***	

Q quartzite ENCB early Neolithic carinated bowl

Table 1. Details of pottery including individual vessels from Ennisnag 1, Co. Kilkenny.

Appendix 2.2 Lithic Report – Farina Sternke

Lithics Finds Report for E3614 Ennisnag 1 (A032/083), Co. Kilkenny

N9/N10 Road Scheme – Phase 4

Farina Sternke

Introduction
Two lithic finds from the archaeological investigations of a prehistoric site at Ennisnag 1, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with a slot trench.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3614:032:1	32	Quartz crystal	Debitage							
E3614:032:2	32	Flint	Debitage							

Table 1 Composition of the Lithic Assemblage from Ennisnag 1 (E3614)

Methodology
All lithic artefacts are examined visually and catalogued using Microsoft Excel. The following details are recorded for each artefact which measures at least 20mm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 20mm are classed as debitage and not analysed further, unless they are retouched or of specific significance e.g. cores etc. The same is done with natural chunks.

Quantification
The artefacts are a worked flint (E3614:066:1) and a worked piece of quartz crystal.

Provenance
The finds were recovered from fill C32.

Technology/Morphology:
The lithics are two pieces of debitage (one flint and one quartz crystal). They may suggest that lithic production, or at least tool re-sharpening took place at this site.

Dating:
The debitage pieces most likely date to the Neolithic or early Bronze Age period.

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

Conclusion
The lithic finds from the archaeological excavation at Ennisnag 1, Co. Kilkenny are a piece of flint debitage and a piece of quartz crystal debitage. The debitage pieces most likely dates to the Neolithic or early Bronze Age period.

This site makes a minor contribution to the evidence for prehistoric settlement in Co. Kilkenny.

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Appendix 2.3 Charcoal and Wood Report – Susan Lyons

Site Name- Ennisnag 1
Excavation number –E3614 AR074
County – Kilkenny
Author- Susan Lyons

Date –20/02/10

CHARCOAL IDENTIFICATION SUMMARY REPORT

1 Introduction

Six charcoal samples were identified and analysed from excavations associated with features excavated at Ennisnag 1 Co. Kilkenny as part of the resolution of the N9/N10 Kilcullen to Waterford Scheme, Phase 4B – Rathclogh to Powerstown. The archaeological excavation revealed the remains of a prehistoric temporary shelter made up of 3.6m of gently curvilinear slot-trench with a posthole at each end and a pair of postholes running parallel with the trench located 4m to the west. Two small groups of pits were also discovered to the north of the structure. Prehistoric pottery was found in the slot-trench (Jennings, 2008).

It is generally considered that the principle reason for charcoal analysis is the hypothesis that wood used as firewood will be collected from as close to a site as possible and as such can help to reflect the local wooded environment in the area. It is also likely that abandoned structural timbers or wood brought to the site for uses in construction works or other activities are also reused as firewood. The charcoal identified can also go some way to interpreting the local woodland that grew in the vicinity of the site and possible changes to that woodland over time. This report serves as a summary report only for Ennisnag 1 and will later form part of an overall scheme-wide charcoal study for the N9/N10 (Lyons, *et al, forthcoming).*

2 Methodology (After IAC Ltd)

2.1 Processing

- A mechanical flotation tank using a pump and water recycling system is used for soil flotation
- The soil is washed using a 1mm mesh in the flotation tank and a 300 micron and 1mm sieve is used to catch floated material.
- The volume of all soil samples are recorded in litres using a measuring jug.
- The sample is then placed into the 1mm mesh in the flotation tank, the tank is then filled with water and the sample washed. Any large lumps of soil can be carefully broken down by hand, but the jets of water in the flotation tank gently clean the rest of the sample.
- Once the sample is clean (just stones, charcoal, artefacts remaining in the mesh) the tank is fill up with water and at this stage any floating material (charcoal, seeds etc) should flow over the spout and into the sieves.
- The retent is then gently poured into a labelled tray (containing site code, site name, sample number and context number) and place on a shelf to dry.
- The flots are securely packaged in tissue, labelled and hung up to dry. This prevents any loss of light material (seeds) which could result once the flots are dry and being moved (if they are dried on trays).
- Before washing a new sample all equipment used (measuring jugs, 1mm mesh, sieves etc) are thoroughly washed using clean water.
- The large black settling tanks (and water) are cleaned between every site, or if a large site is being processed, every 1–2 weeks.
- Any samples containing high clay content will be soaked in water for 1–2 days to aid the sieving process.

2.2 Charcoal identifications

Six charcoal samples from **C13** (fill of posthole **C12**), **C23** (fill of posthole **C22**) and **C25** (fill of posthole **C24**) and **C28** (fill of posthole **C26**), **C32** (fill of slot trench **C17**), **C35** (fill of posthole **C34**) were selected for charcoal analysis.

The larger sized charcoal fragments (>3mm in width) are fractured to view the three planes [transverse, radial and tangential sections] necessary for microscopic wood identification. The wood species identifications are conducted under a binocular

microscope using a trancident light and viewed at magnifications of 100x, 200x and 400x where applicable. Where possible the age and growth pattern of the wood fragments is also recorded by studying the transverse section at a magnification of up to 40x.

Wood species identifications are made using wood reference slides and wood keys devised by Franklin and Brazier (1961), Schweingruber (1978), Hather (2000) and the International Association of Wood Anatomists (IAWA) wood identification manuals and (www.lib.ncsu/edu/insidewood) by Wheeler, Bass and Gasson (1989).

Quantifying charcoal samples can be difficult as many wood species can be affected by heat is different ways and hence become fragmented into an arbitrary number of fragments. Due to the potential for a very high number of charcoal fragments from the samples, a representative sample of 50 charcoal fragments (Keepax, 1988) are randomly chosen from larger samples for identification and analysis. In the case of smaller samples all charcoal fragments within are identified. The charcoal fragments of each species identified are counted, weighted (grams) and bagged according to species.

2.3 Details of charcoal recording

The general age group of each taxa per sample is recorded, and the growth rates are classified as slow, medium, fast or mixed. It was not within the scope of this project to measure all the ring widths from the charcoal, however, some measurements are taken with a graticule in the microscope in order to make the scale of slow, medium and fast growth less subjective. Slow growth within the charcoal from this site is considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The ring curvature is also noted where applicable from each charcoal fragment. Weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or twigs **Fig. 1.** Tyloses within the vessels of species such as oak can denote the presence of heartwood. These are balloon-like outgrowths of adjacent parenchyma cells of xylem vessels (vascular tissue used to transport water and minerals). When the plant is subjected to stressful conditions, tyloses will develop and block the vascular tissue to prevent further damage to the plant.

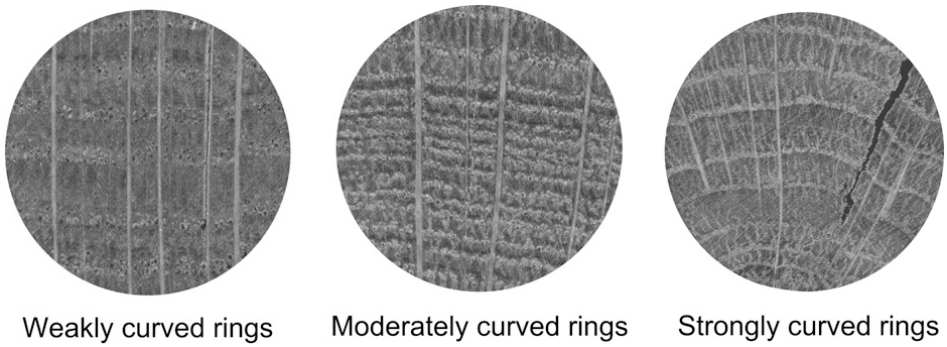

Fig. 1. Ring curvature (after Marguerie and Hunot 2007 1421, Fig. 3)

3 Results

The results of the charcoal identifications are summarized in **Table 1**

Five wood species totaling 138 identifications were recorded from the samples associated with Ennisnag 1. *Fraxinus excelsior* (ash) was the dominant wood species recorded from all contexts selected for charcoal analysis. Lower incidences of *Corylus avellana* (hazel) were also recorded, most notably from **C13** and **C25.** *Prunus* sp. (cherry-type) was identified from **C13,** while *Quercus* sp. (oak) and *Pomoideae* spp. (pomaceous woods) were present within **C32 (Fig. 2)**.

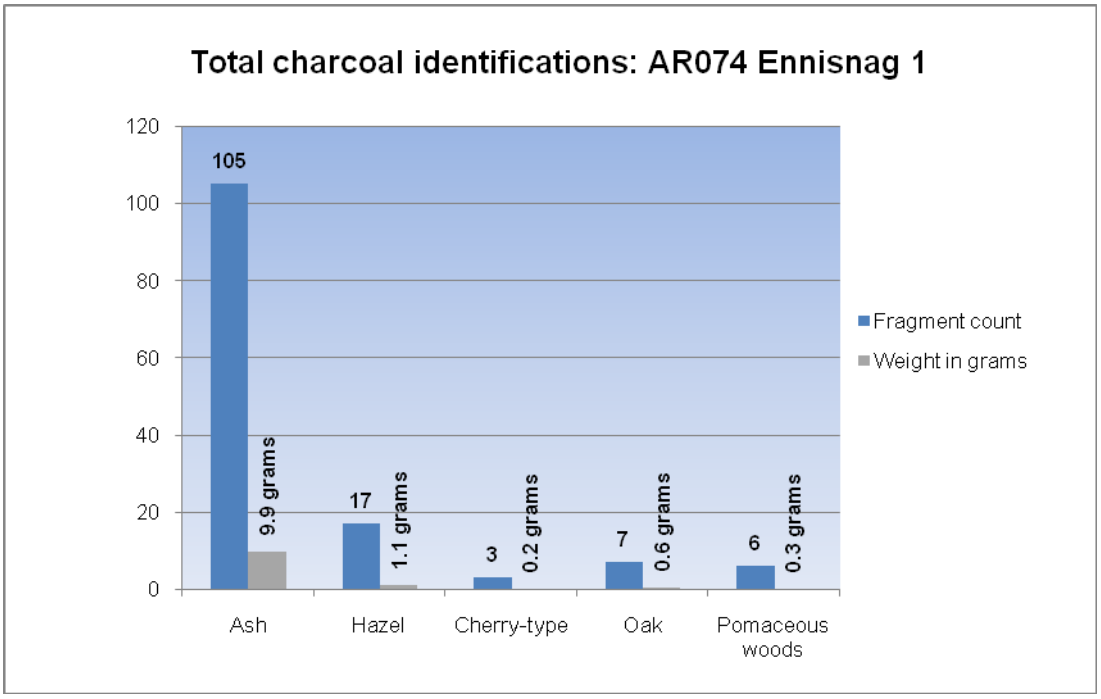

Fig. 2

4 Discussion

4.1 Background and origin of wood species

Fraxinus excelsior (ash)

Ash thrives well on nutrient-rich soils but is also a common woodland species and grows in mixed woodland with oak on damp, slightly acidic soils (Gale & Culter, 2000). Pollen analysis indicates that ash became more common in the pollen record from the Neolithic period onwards (Mitchell, 1953/4). This could be as a result of more clearance due to agricultural practices at the time, where ash was able to germinate and grow more vigorously as secondary woodland and in marginal areas and hedges (Kelly, 1976). Ash is also abundant in native hedgerows and was quite common in the later historic period.

Corylus avellana (hazel)

Hazel woodlands replaced birch in the early post-glacial forests and remains on some shallow limestone soils to the present day (Pilcher & Hall, 2001). The species can tolerate most soil types, but not waterlogged conditions and forms a small deciduous tree or shrub. It commonly occurs in understorey of oak and/or ash woodlands, where it may grow to a height of 10m or more. In open areas or woodland glades hazel grows as a shrub. Hazel is a common species recorded from Irish archaeological sites and its widespread presence is highlighted in pollen diagrams from the Neolithic to the medieval period (Caseldine, 1996). It produces good firewood and is a suitable wood for kindling. The wood is soft enough to be split yet flexible and strong enough to be used in rope making and basketry. It has also proved a useful resource in the construction of hurdles, wattling, palisades and trackways from prehistoric times

(Pilcher & Hall, 2001). Hazel also makes for a good starter fuel especially as tinder or in kindling.

Prunus sp. (cherry-type)
The cherry species can be difficult to distinguish in the absence of bark, buds and leaves. Wild cherry (*P. avium)* is a medium to tall tree, common to woodlands and hedges on light, well-drained soils. It produces inferior firewood. The timber is a red colour and although tough and hard is unsuitable for outdoor use as it decayed easily (Culter and Gale, 2000). Bird cherry (*P. padus)* is a smaller tree and less common than wild cherry. It grows in marginal woodland as a solitary tree and can live for up to eighty years (Rackham, 1980). The wood has no real economical value, although has been used in barrel production (Culter and Gale, 2000). Both species are used in the production of ornamental or culinary objects (Culter and Gale, 2000).

Quercus sp. (oak)
Oak is a tall deciduous woodland tree, often growing in association with hazel and ash. Most species prefer damp, non-calcareous soils on lowland or montane sites. Of the 27 European species, pedunculate oak (*Quercus robur)* and sessile oak (*Quercus petraea)* are native to Ireland. Pedunculate oak is common on heavy clay lowland soils whereas sessile oak thrives on the lighter loams characteristic of higher ground (Culter & Gale, 2000). The wood is easy to cleave both radially and tangentially and has provided one of the most important building materials since the prehistoric period (Gale & Culter, 2000). The heartwood timber is renowned for its durability but the paler sapwood is susceptible to beetle and fungal attack. The strength of the timber depends on the species and is influenced by climatic and edaphic factors (Edlin, 1951). When burnt, oak charcoal, particularly the dense heartwood, has higher calorific values than most European woods and this can make for good long-lasting fuel (Culter & Gale, 2000).

Pomoideae spp. (pomaceous woods)
The pomaceous wood species includes the genera *Malus* (apple), *Pyrus* (pear), *Sorbus* (rowan/mountain ash or whitebeam) and *Crataegus* (hawthorn). They are anatomically very similar and in the absence of bark, buds and leaves cannot be differentiated between each other very often. The pomaceous wood types are small deciduous spiny trees or shrubs and are common to the scrubby margins of woodlands and hedgerows (Gale & Culter, 2000). Hawthorn is shade-tolerant and forms understorey in ash and hazel woodland. Both hawthorn and apple-type (*Malus* sp.) produced edible fruits which would have been gathered as a foodstuff during the prehistoric period (Greig, 1991). These wood types burn slow and steady and provide excellent heat with minimal smoke (Culter & Gale, 2000). In later prehistoric periods, these wood species are more prevalent in the landscape, perhaps as a result of opening up larger areas of land or the fencing off of certain areas (Stuijts, 2003/4, 20).

4.2 Distribution of charcoal from Ennisnag 1

The number of identifiable charcoal fragments recovered from Ennisnag 1 were localised to just postholes and a slot trench recorded at the site; **C13** (fill of posthole **C12**), **C23** (fill of posthole **C22**) and **C25** (fill of posthole **C24**) and **C28** (fill of posthole **C26**), **C32** (fill of slot trench **C17**), **C35** (fill of posthole **C34**).

The presence of ash and hazel charcoal from postholes **C12 (C13), C22 (C23), C24 (C25), C26 (C28)** and **C34 (C35)** may represent the remains of structural wood, where ash and hazel were the woods of choice used in construction works. Ash was a popular wood used in construction during the prehistoric period (Gale & Culter, 2000) while hazel and pomaceous woods were both used in the construction of

lighter structures, such as wind breakers and wattling (Gale & Culter, 2000). *Prunus* sp. (cherry-type), albeit low was also recorded from postholes **C12 (C13).** Due to the low occurrence of this species it is likely to represent the remains of re-deposited charred debris from nearby firing events. Slot trench **C17** contained ash, pomaceous woods, and the only evidence for oak. The presence of oak was again quite low and while this could represent the remains of structural wood, it is also likely that it entered these deposits inadvertently as re-deposited material.

Overall, the low charcoal content recorded makes it difficult to ascertain whether this material is the remains of a burnt structure. Charred wood is often the result of construction methods such as a) the charring of post bases to prevent the timbers from rotting b) a way of re-sizing posts of c) the method by which the timbers were felled. It is also possible that the charcoal reflects the remains of burning debris which became incorporated into sealing and infilling posthole deposits from nearby firing events.

5 Summary

The charcoal fragments from **C13** (fill of posthole **C12**), **C23** (fill of posthole **C22**) and **C25** (fill of posthole **C24**) and **C28** (fill of posthole **C26**), **C32** (fill of slot trench **C17**), **C35** (fill of posthole **C34**) were selected for charcoal analysis.

Five wood species were recorded from the site (ash, hazel, oak, pomaceous woods and cherry-type). Since the samples were confined to structural deposits (postholes and a slot trench), it is possible that the charcoal remains recovered represent some of the woods used in construction works at the site. The preponderance of ash and hazel suggests that they were the woods of choice in construction methods at the site. The much lower occurrence of oak, pomaceous woods and cherry-type, while they may have been part of the construction materials, may also have entered these features inadvertently as re-deposited charred debris from nearby hearths or firing events.

The results from this site will be later merged and discussed with similar sites also excavated along the N9/N10 scheme.

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Table 1 Charcoal identification results from AR074 Ennisnag 1 (E3614)

Context number	Sample number	Flot volume (grams)	Context description	Wood Species Identifications	No. of fragments	Charcoal weights (grams)	Size of fragments (mm)	No. of growth rings	Growth ring curvature	Comments
13	01	3.3g	Fill of posthole C12, located to east of structure	Fraxinus excelsior (ash)	13	3 grams	4mm - 10mm	3 - 6 rings	weak	
				Corylus avellana (hazel)	5	0.3 grams	3mm - 6mm	4 rings	strong	
				Prunus sp. (cherry-type)	3	0.2 grams	3mm - 5mm	<3 rings		
23	03	0.5g	Fill of posthole C22 unrelated to structure	Fraxinus excelsior (ash)	7	0.4 grams	3mm - 10mm	3 - 5 rings	weak	
25	4	2.9 grams	Fill of posthole C24	Fraxinus excelsior (ash)	20	1.4 grams	3mm - 8mm	2 - 5 rings	weak	
				Corylus avellana (hazel)	12	0.8 grams	3mm - 5mm	3 rings	weak	
28	02	2.8g	Fill of posthole C26, part of house structure	Fraxinus excelsior (ash)	26	2.1 grams	3mm - 7mm	2 - 4 rings	weak	
32	05	4.0g	Fill of slot trench C17 of house structure	Fraxinus excelsior (ash)	25	2.6 grams	4mm - 12mm	4 - 6 rings	20% strong	
				Quercus sp. (oak)	7	0.6 grams	4mm - 6mm	3 rings	weak	
				Pomoideae spp. (pomaceous woods)	6	0.3 grams	4mm	2 - 4 rings	weak	
35	06	2.4g	Fill of posthole C34 part of house structure	Fraxinus excelsior (ash)	14	1.4 grams	3mm - 9mm	3 - 5 rings	weak	

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Client – Irish Archaeological Consultancy Ltd
Site Name- Knockadrina 1
Excavation number – E3614 AR074
County – Kilkenny
Author- Penny Johnston
Date – June 2009

Introduction

This report details the analysis of plant remains recovered from excavations at AR074, Ennisnag 1 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown.

Methodology

The samples were processed by the client, who also carried out a preliminary sorting of the samples. This pre-selection of the plant remains may bias the final plant records from these sites, as it is possible that many small items, such as weed seeds and chaff, were not picked out.

The selected material was sent to Eachtra Archaeological Projects where it was examined under a low-powered binocular microscope (X6 –X45). Suitable plant material was identified and the results of analysis are presented in Tables 1 – 25 at the end of this report. Scientific names are mainly confined to these identification tables in order to facilitate easy reading of the text. Nomenclature and taxonomic orders generally follows Stace (1997).

Results

The only plant remains found were the charred fragments of hazelnut shells.

The site comprised the remains of a temporary prehistoric camp including a linear slot trench and four post-holes. Just one sample from this site was analysed. Fragments of charred hazelnut shell fragments were found. The small quantities of remains recovered suggests that these are relatively insignificant indicators of diet and plant use at the site. These are ubiquitous finds in Irish archaeobotanical assemblages. Eating hazelnuts creates quite a large amount of waste (Monk 2000, 75) and archaeobotanists generally agree that a small collection of hazelnut shell fragments is unlikely to be a significant indicator of site diet (e.g. McClatchie 2007, 65). Therefore, the few fragments retrieved from this site are probably relatively unimportant.

Table 1: Identified plant remains from Ennisnag 1 E3614

Context	**32**
Sample	**5**
Hazelnut shell fragments (*Corylus avellana* L.)	9

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Appendix 2.5 Radiocarbon Dating Results – QUB Laboratory

The "Measured radiocarbon age" is quoted in conventional years BP (before AD 1950). The error is expressed at the one-sigma level of confidence.

The "Calibrated date range" is equivalent to the probable calendrical age of the sample material and is expressed at the two-sigma (95.4% probability) level of confidence

Calibration data set: intcal09.14c

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C32	5	Hazelnut Shell	*Corylus Avellana (Hazel)* 0.1g	QUB	UBA 15544	AMS Std	3510–3372BC (1 sigma) 3518–3368BC (2 sigma)	4665±25	-20.2
C35	6	Charcoal	*Fraxinus Excelsior* (Ash) 0.4g	QUB	UBA 15545	AMS Std	3891–3711BC (1 sigma) 3941–3696BC (2 sigma)	4998±33	-24.5

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111-1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14
NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

APPENDIX 3 LIST OF RMP IN AREA

RMP No	Description
KK023-080	Castle Ringwork
KK023-080001	Designed Landscape, folly
KK023-077	Ringfort, Unclassified
KK023-078	Ringfort, Unclassified
KK023-076	Ringfort, Unclassified
KK023-075	Ritual Site, Holy Well
KK023-079	Ringfort, Unclassified
KK023-005	Enclosure
KK023-004	Enclosure

See Figure 2 for location.

APPENDIX 4 LIST OF SITE NAMES

Site Name	Site Code	E Number	Director	NGR
Baysrath 2	AR055	E3627	Fintan Walsh	251593/137855
Baysrath 3	AR056	E3628	Fintan Walsh	251672/138000
Baysrath 4	AR057	E3629	Fintan Walsh	251515/138280
Danganbeg 1	AR058	E3606	Emma Devine	251462/138754
Danganbeg 2	AR059	E3607	Emma Devine	251397/138939
Danganbeg 3	AR060	E3671	Emma Devine	251430/139245
Danganbeg 4	AR061	E3676	Emma Devine	251401/139372
Knockadrina 1	AR062	E3677	Ed Lyne	251422/139420
Tinvaun 1	AR063	E3678	Ed Lyne	251482/139625
Tinvaun 2	AR064	E3680	James Kyle	251445/139736
Tinvaun 3	AR065	E3608	James Kyle	251501/139832
Tinvaun 4	AR066	E3609	James Kyle	251508/139917
Stonecarthy West 1	AR067	E3610	James Kyle	251538/140023
Knockadrina 2	AR068	E3611	James Kyle	251647/140237
Rathduff 1	AR069	E3612	Ed Lyne	251286/142167
Rathduff Upper 1	AR070	E3613	Ed Lyne	251280/142559
Kellsgrange 1	AR071	E3575	James Kyle	250911/143732
Kellsgrange 2	AR072	E3577	James Kyle	250967/143861
Kellsgrange 3	AR073	E3576	James Kyle	250948/144003
Ennisnag 1	AR074	E3614	Richard Jennings	251416/145690
Ennisnag 2	AR075	E3615	Richard Jennings	251638/146068
Danesfort 12	AR076	E3616	Richard Jennings	251669/146186
Danesfort 13	AR077	E3617	Richard Jennings	251765/146384
Danesfort 2	AR078	E3540	Richard Jennings	251953/146745
Danesfort 4	AR079	E3539	Richard Jennings	251880/147579
Danesfort 3	AR080A	E3542	Richard Jennings	252221/146845
Danesfort 1	AR080B	E3541	Richard Jennings	252267/146707
Croan 1	AR081	E3543	Emma Devine	252280/147332
Danesfort 5	AR082	E3546	Emma Devine	252567/147767
Danesfort 6	AR083	E3538	Emma Devine	252764/147995
Danesfort 7	AR084	E3537	Emma Devine	252878/148099
Danesfort 8	AR085	E3461	Richard Jennings	253020/148246
Danesfort 9	AR086	E3468	Richard Jennings	253089/148345
Danesfort 10	AR087	E3459	Richard Jennings	253229/148414
Danesfort 11	AR088	E3460	Richard Jennings	253245/148462
Rathclogh 1	AR089	E3726	Patricia Lynch	253365/145515
Rathclogh 2	AR090	E3727	Patricia Lynch	253650/148848
Kilree 1	AR091	E3728	Patricia Lynch	254088/149310
Kilree 2	AR092	E3729	Patricia Lynch	254320/149500
Kilree 3	AR093	E3643	Patricia Lynch	254449, 149639
Kilree 4	AR094	E3730	Patricia Lynch	255330/150084
Dunbell Big 2	AR095	E3853	Yvonne Whitty	256684/151066
Holdenstown 1	AR096	E3681	Yvonne Whitty	256737/151253
Holdenstown 2	AR097/98	E3630	Yvonne Whitty	256891/151781
Holdenstown 3	AR099	E3854	Yvonne Whitty	256990/152085
Holdenstown 4	AR100	E3682	Yvonne Whitty	256828/152048
Dunbell Big 1	AR101	E3855	Yvonne Whitty	257034/152315
Rathcash 1	AR102	E3859	Tim Coughlan	258178/154199
Rathcash 2	AR103	E3860	Tim Coughlan	258294/154293
Rathcash East 1	AR104	E3892	Tim Coughlan	259419/154546
Rathcash East 2	AR105	E3893	Tim Coughlan	259555/154566
Rathcash East 3	AR106	E3861	Tim Coughlan	259821/154653
Blanchvillespark 1	AR107	E3894	Richard Jennings	260535/155212

Site Name	Site Code	E Number	Director	NGR
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449
Blanchvillespark 3	AR109	E3913	Tim Coughlan	260785/155653
Blanchvillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchvillespark / Ballyquirk 1	AR111	E3862	Ruth Elliott	261531/156323
Ballyquirk 1	AR112	E3863	Ruth Elliott	261531/156323
Ballyquirk 2	AR113	E3864	Ruth Elliott	261811/156508
Ballyquirk 3	AR114	E3865	Ruth Elliott	261875/156559
Ballinvally 1	AR115	E3836	Emma Devine	263258/157521
Garryduff 1	AR116	E3852	Emma Devine	263933/157991
Kilmacahill 1	AR117	E3915	Tim Coughlan	264267/158369
Kilmacahill 2	AR118	E3833	Tim Coughlan	264380/158453
Jordanstown 1	AR119	E3834	James Kyle	264546/158643
Jordanstown 2	AR120	E3851	James Kyle	264893/159038
Kellymount 6	AR121	E3758	Przemaslaw Wierbicki	265130,159277
Jordanstown 3	AR122	E3916	Przemaslaw Wierbicki	265103/159227
Kellymount 1	AR123	E3756	Przemaslaw Wierbicki	265250/159397
Kellymount 2	AR124	E3757	Przemaslaw Wierbicki	265164/159463
Kellymount 3	AR125	E3856	Przemaslaw Wierbicki	265338/159597
Kellymount 4	AR126	E3857	Przemaslaw Wierbicki	265412/159803
Kellymount 5	AR127	E3858	Przemaslaw Wierbicki	265530,159977
Shankill 2	AR128	E3738	Richard Jennings	265924/160651.
Shankill 3	AR129	E3737	Richard Jennings	266052/161141
Shankill 4	AR130	E3838	Richard Jennings	266286/161526
Shankill 5	AR131	E3850	Richard Jennings	266374/161730
Shankill 6	AR132	E3840	Richard Jennings	266403/161836
Moanmore 1	AR133	E3835	Richard Jennings	266476/162016
Moanmore 2	AR134	E3843	Sinead Phelan	266756/162866
Moanmore 3	AR135	E3837	Sinead Phelan	266856/163259
Bannagagole 1	AR136	E3844	Sinead Phelan	266942/163569
Moanduff 1	AR137	E3839	Robert Lynch	267261/164397
Coneykeare 1	AR138	E3683	Sinead Phelan	267836/166209
Coolnakisha 1	AR139	E3768	Ellen O'Carroll	268175/167274
Coolnakisha 2	AR140	E3767	Ellen O'Carroll	268306/167559
Cranavonane 1	AR141	E3842	Tim Coughlan	268554/167895
Cranavonane 2	AR142	E3732	Ellen O'Carroll	268830/168154
Cranavonane 3	AR143	E3731	Ellen O'Carroll	269123/168362
Tomard Lower 1	AR144	E3733	Ellen O'Carroll	269349/168496
Paulstown 1	AR145	E3642	Ruth Elliot	265889/158499
Paulstown 2	AR146	E3632	Ruth Elliot	265664/158651
Rathgarvan or Clifden 1	AR147	E3760	Przemaslaw Wierbicki	257026/154123
Maddockstown 1	AR148	E3759	Przemaslaw Wierbicki	256886/154199
Templemartin 3	AR149	E3845	Emma Devine	255095/155200
Templemartin 4	AR150	E3841	Emma Devine	254920/155427
Templemartin 5	AR151	E3846	Emma Devine	254706/155636
Templemartin 1	AR152	E3849	Emma Devine	254504/155826
Templemartin 2	AR153	E3847	Emma Devine	254173/156236
Leggetsrath East 1	AR154	E3734	Emma Devine	253793/156484
Moanduff 2	AR155	E3735	Sinead Phelan	267470/164887
Moanduff 3	AR156	E3736	Sinead Phelan	267515/164979
Ballyquirk 4	AR157	E3848	Richard Jennings	262596/157025
Shankill 1	AR158	E3766	Przemaslaw Wierbicki	265707/160269
Rathgarvan or Clifden 2	AR159	E3921	Tim Coughlan	257095/154119
Ballynolan 1	AR160	E3755	Sinead Phelan	267714/165597
Rathduff Upper 3	UA2	E3974	Tim Coughlan	250991/143565
Rathduff Bayley	UA4	E4011	Tim Coughlan	251005/143564