

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



<b>Ministerial Direction</b>	A032
<b>Scheme Reference No.</b>	
<b>Registration No.</b>	E3755
<b>Site Name</b>	AR160, Ballynolan 1
<b>Townland</b>	Ballynolan
<b>County</b>	Kilkenny
<b>Excavation Director</b>	Sinéad Phelan
<b>NGR</b>	267714 165597
<b>Chainage</b>	70680

### FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

MARCH 2011

## PROJECT DETAILS

<b>Project</b>	N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown
<b>Ministerial Direction Reference No.</b>	A032
<b>Excavation Registration Number</b>	E3755
<b>Excavation Director</b>	Sinéad Phelan
<b>Senior Archaeologist</b>	Tim Coughlan
<b>Consultant</b>	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
<b>Client</b>	Kilkenny County Council
<b>Site Name</b>	AR160, Ballynolan 1
<b>Site Type</b>	Post-medieval ditch
<b>Townland(s)</b>	Ballynolan
<b>Parish</b>	Ballinamara
<b>County</b>	Kilkenny
<b>NGR (easting)</b>	267714
<b>NGR (northing)</b>	165597
<b>Chainage</b>	70680
<b>Height OD (m)</b>	57.709
<b>RMP No.</b>	N/A
<b>Excavation Dates</b>	17–27 September 2008
<b>Project Duration</b>	20 March 2007–18 April 2008
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<b>Report By</b>	Sinéad Phelan and Tim Coughlan
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## **ACKNOWLEDGEMENTS**

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 AR160, Ballynolan 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 Sinéad Phelan under Ministerial Direction A032 and Excavation Registration Number E3755 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between the 17 and 27 September 2008.

An area measuring 400m<sup>2</sup> was opened and a substantial, east-west ditch measuring 3.5m in width with a depth of 1m traversed the site. A second, smaller ditch was also recorded and at the western side of the site a large area of burning was identified but represented a phase of clearance, probably in the last century. This is likely to have occurred as part of land management.

Evidence from the 1st and 2nd edition OS maps shows that there was re-working to field boundaries in the general area of the site, with boundaries being removed and others being inserted, straightened etc. and it is felt that this ditch may represent part of this alteration but given the proximity of the existing boundary ditch to the south, alterations cannot be established with 100% accuracy based on the mapping. While nothing diagnostic was recovered from the ditch fills and the site remains undated there was no evidence to suggest that the features were of archaeological significance and they certainly did not represent part of an enclosure. They are therefore interpreted as being associated with post-medieval land management and as such are not of any archaeological significance.



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## **1 INTRODUCTION**

### **1.1 General**

This report presents the results of the archaeological excavation of Ballynolan 1, AR160 (Figure 1), in the townland of Ballynolan undertaken by Sinéad Phelan 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 400m<sup>2</sup> and was first identified during testing carried out in April 2007 by Yvonne Whitty (E3365) for IAC Ltd on behalf of the National Roads Authority. Ballynolan 1 was excavated between 17 and 27 September 2007 with a team of one director and one supervisor and 10 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. 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

The site at Ballynolan 1, AR160, was the result of land clearance and consisted of a small spread of burning and two field ditches (Plate 1). The site was located in the corner of a large, sloping and tilled field, delimited by an existing field boundary to the south and west (Plate 6). The landscape sloped to the east which provided views of the surrounding terrain which generally comprised of tillage and a small amount of marginal land directly to the south-west. The site was well drained. Views to the north and north-east are dominated by hills, The Blackstairs Mountains are visible to the east and south-east beyond the latter hills; Mount Leinster in particular is the most prominent peak. To the south Brandon Hill is visible in the distance. Coneykeare 1 is visible c. 350m to the north.

### 2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A	N/A	N/A	N/A	Brownish yellow silty clay with small stones	Subsoil

The subsoil on this site consisted of brownish yellow silty clay and small stones across the site, and was cut by or sealed by all subsequent archaeological activity.

### 2.2 PHASE 2 Post-medieval / Modern Activity

#### 2.2.1 Linear Ditch C10

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C4	C10	9.00	3.50	0.90	Moderate burnt dark black silty clay	Fill of C10
C5	C10	7.20	3.50	0.85	Compact grey brown clay	Fill of C10
C 10	N/A	11.0	6.70	1.20	Linear feature	Cut of ditch
C 11	C10	11.00	3.30	1.20	Moderate brown clay with pebbles	Fill of C10

**Finds:** None

This represented an east-west ditch that continued beyond the excavation limits. Its precise function is unclear but it may have been an old field boundary, as it was only 7m from the current boundary to the south, although with a slightly different orientation. Significant reorganising of the field boundaries in this area was undertaken during the mid-19th century as evident in the 1st and 2nd edition OS maps. It is thought that this ditch may represent part of an altered boundary but given the proximity of the existing boundary ditch (to the south) this cannot be established with complete accuracy on the mapping alone.

Ditch C10 had been subject to a degree of disturbance to its upper level in the east of the site and had a maximum width of 6.70m in this area. The fills in this area included black silty clay probably as a result of burning. It is interpreted that this section of the ditch had been subject to tree clearance which resulted in the disturbed area.

A total of 10 animal bone fragments were identified within C4 the fill of linear ditch feature C10, the bone fragments were identified as cow (*bos*) rib bones (McCarthy Appendix 2.3).

#### 2.2.2 Linear Ditch C 9

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C6	C9	17.5	1.76	0.25	Loose dark greyish brown sandy silt	Fill of C9
C7	C9	17.5	1.06	0.20	Loose mid brown clayey silt	Fill of C9
C8	C9	17.5	0.83	0.23	Stiff light brown silty clay	Fill of C9
C9	N/A	17.5	1.76	0.52	Linear feature	Cut of ditch

**Finds:** None

This represented an east-west ditch that continued beyond the excavation limits. Its precise function is unclear but it may have been associated with drainage. It was parallel to and north of the larger ditch C10.

**2.2.3 Shallow Spread C3**

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	0.90	0.82	0.04	Friable black brown with charcoal	Deposit

**Finds:** None

Located 3m to the south of ditch C10 was a shallow deposit C3 which consisted of friable black brown clay with charcoal (Plate 2).

Charcoal analysis of deposit C3 indicated a predominance of alder (*Alnus glutinosa*) with some ash wood (*Fraxinus excelsior*) also present which may suggest a type of charcoal production pit with alder coppice wood being sourced and used. (O'Carroll, Appendix 2.2).

**2.3 PHASE 3 Topsoil and Ploughsoil**

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	N/A	N/A	0.25	Brown sandy clayey silt with small stones	Topsoil

**Finds**

Context	Find Number	Material	Period	Description
C1	E3755:001:1	Pottery	Modern	Modern pottery sherd

The topsoil comprised a sandy clay and contained a single modern pottery sherd.

A single sherd of pottery identified as pearlware was recovered from topsoil. This is an undecorated piece, possibly from the base of a plate dating to the later 18th and 19th centuries (McCutcheon, Appendix 2.1).

### 3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Ballynolan 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 17<sup>th</sup> 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 kilometers 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



Portarlinton, Athy, Carlow, and Graiguenamanagh and runs through 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. Ballynolan 1 is located in the northern landscape area.

### **3.1.2 The Northern Landscape**

The northern landscape of the N9/N10 crosses the border from Kilkenny into Carlow and traverses the western side of the River Barrow; the Blackstairs Mountains, which are of granite formation, are located to the east of the Barrow. It includes 50 sites discovered during the Phase 4 excavations stretching from Rathcash 1 northwards to Tomard Lower 1. This northern landscape is overlooked to the west by the Castlecomer Plateau, and the excavated sites are all situated on contours of 50–100m OD. From the south-west of the Barrow, and encroaching into the northern landscape, the underlying limestone is dolomitized and consequently the permeability has been increased. The glacial drift comprises slightly sandy (20–60%) slightly gravely clays with a moisture content of 10–20%. There is therefore significantly less sand but higher moisture content than in the southern and central landscapes. This moisture occurs in the wetter deposits in the top 1–2m before ground level in localised areas with silty sand and gravel lenses indicating a high water table. To the east of the River Barrow, localised silty, laminated clays and peat occur. Soft ground was noted in the river's floodplain. The area is also classified as a minor aquifer in the Kilkenny Groundwater Protection Scheme (Buckley & Fitzsimmons, 2002) due to these thick sand and gravel deposits. Progressing northwards, the views become more expansive, and the rising high ground of the Castlecomer Plateau (50–300m OD) bounds the distant landscape. This plateau consists of a variety of hills and peaks, which contain seams of anthracite, the focus of coal mining in the region from the 17<sup>th</sup> century. The Blackstairs Mountains (735m) are visible on the horizon to the south-east, and most obvious of these is the peak of Mount Leinster (795m). There are impressive views from these plateaus and hills especially to the south, east and west over the Barrow and Nore Valleys.

The prevailing watercourse of this region is the River Barrow which travels north–south through the landscape. The Maudlin River is a tributary of the River Barrow and flows from the west through Old Leighlin; minor tributaries of this river flow through Bannagagole, directly north of Moanmore, and the River Dinin is a tributary of the River Nore which travels south-west from Brennan's Hill through the Castlecomer Plateau. The suffix 'comer' signifies a meeting of the rivers; it also signifies any deep gripe, such, for instance, as the channel formed by a mountain stream (Carrigan 1905). From the hinterland of Kilkenny and the confluence of the Nore and Barrow the Monefelim River contributes to the occurrence of wet grassland and broadleaf woodland. The narrow tributaries of the River Barrow, including the Monefelim River, as well as the Maudlin River, flow from the higher, steep, escarpment located to the west. Subsoils in this area consist of undifferentiated alluvium and soils of mineral alluvium. The route crosses into County Carlow where at Moanmore (meaning 'great

bog') a variety of archaeological features have been recorded. At the most northerly point of the N9/N10 the land is again characterised by its views; here they include the Barrow Valley, Mount Leinster, Brandon Hill, and the Blackstairs Mountains.

### **3.1.3 Site Specific Landscape**

The site at Ballynolan 1, AR160, was the result of land clearance and consisted of a small spread of burning and two field ditches (Plate 1). The site was located in the corner of a large, sloping and tilled field, delimited by an existing field boundary to the south and west (Plate 6). The landscape sloped to the east which provided views of the surrounding terrain which generally comprised of tillage and a small amount of marginal land directly to the south-west. The site was well drained. Views to the north and north-east are dominated by hills, The Blackstairs Mountains are visible to the east and south-east beyond the latter hills; Mount Leinster in particular is the most prominent peak. To the south Brandon Hill is visible in the distance. Coneykeare 1 is visible c. 350m to the north.

## **3.2 The Archaeological Landscape**

As part of the general research relating to sites along the scheme and the specific research relating to Ballynolan 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 Ballynolan 1 has been interpreted as being post-medieval in date.

### **3.2.1 The Site Specific Archaeological Landscape of Ballynolan 1 – compiled by Michelle Brick**

There are no recorded monuments in the immediate vicinity of Ballynolan 1. An enclosure (CW012-069) is recorded c. 1.5km to the north-east and the site of an enclosure (CW15-003) is also situated c. 1km to the south of Ballynolan 1. Another enclosure site (CW011-014) is recorded c. 1.3km to the north-west.

Post medieval/modern activity was recorded at Ballynolan 1 in the form of ditches and a large area of burning. A number of sites were excavated in the vicinity of Ballynolan 1, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. Coneykeare 1 was located c. 600m to the NNE and a portion of a ringfort, two kilns and associated features were excavated at this site. A late Iron Age/early medieval date has been returned for the ditch of the ringfort and early medieval dates have been returned for the remaining features excavated. Beyond Coneykeare 1, Coolnakisha 1 was located c. 1.7km to the NNE, and a possible truncated structure with associated pits was excavated. The possible structure has been dated to the late Neolithic/early Bronze Age and a late Bronze Age date has been returned for one of the pits indicating the site had more than one phase of occupation.

Moanduff 3 was located c. 620m to the SSW and a late Bronze Age oval pit filled with burnt material and eight stakeholes were excavated at this site. Moanduff 2 was located directly to the south of Moanduff 3, c. 650m away from Ballynolan 1 and a considerable number of postholes, stakeholes, pits and linear features were excavated, which returned dates from the early /middle Neolithic, the late Neolithic / early Bronze Age, middle-late Bronze Age, and early medieval. Possible structures were also excavated and it is apparent that this site was re-used throughout prehistory. Moanduff 1 was located c. 1.2m to the SSW and burnt mound activity, associated features, and a stake built sub rectangular structure were excavated. The burnt mound activity has been dated to the early Bronze Age period and the structure

has been dated to the late Iron Age period. A pit associated with drainage channels also excavated at the site has returned an early medieval date and a possible trough has been dated to the medieval period; suggesting this site also had a number of occupation phases.

### **3.3 Summary of the Excavation Results**

An area measuring 400m<sup>2</sup> was opened and a substantial, east–west ditch measuring 3.5m in width with a depth of 1m traversed the site. A second, smaller ditch was also recorded to the north of and parallel to the main ditch. At the western side of the site a large area of burning was identified but represented a phase of clearance in the last century. This is likely to have occurred as part of land management. The ditches are likely to represent field boundaries or drainage ditches.

### **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

#### ***Post-medieval pottery analysis***

A single sherd of pottery was presented for study, identified as pearlware. The small sherd recovered is an undecorated piece, possible from the base of a plate.

#### ***Charcoal and Wood Species identification***

Charcoal was examined from a deposit at Ballynolan 1. The results are dominated by alder with some ash wood also present.

#### ***Animal Bone Analysis***

All ten bone fragments of the faunal remains assemblage were identified to species and element. The faunal remains assemblage recovered from Ballynolan 1 contained bones from a single species of cow.

## **4 DISCUSSION AND CONCLUSIONS**

### **4.1 Discussion**

The excavation of the site at Ballynolan 1 has identified probable boundary ditches/drainage channels and a spread of burning. The ditches ran broadly parallel to the present field boundary and indeed the main ditch was only 7m further to the north. Significant reorganising of the field boundaries in this area was undertaken during the mid-19th century as evident in the 1st and 2nd edition OS maps. It is thought that this ditch may represent part of an altered boundary but given the proximity of the existing boundary ditch (to the south) this cannot be established with complete accuracy on the mapping alone.

The spread of burning has been identified as associated with land clearance and there is evidence that part of the larger ditch was disturbed by a large tree bole. While nothing diagnostic was recovered from the ditch fills and the site remains undated, there was no evidence to suggest that the features were of archaeological significance and they certainly did not represent part of an enclosure. They are therefore interpreted as being associated with post-medieval land management and as such are not of any archaeological significance.

### **4.2 Conclusions**

Ballynolan 1 represents post-medieval land management activity. No features of archaeological significance were identified.

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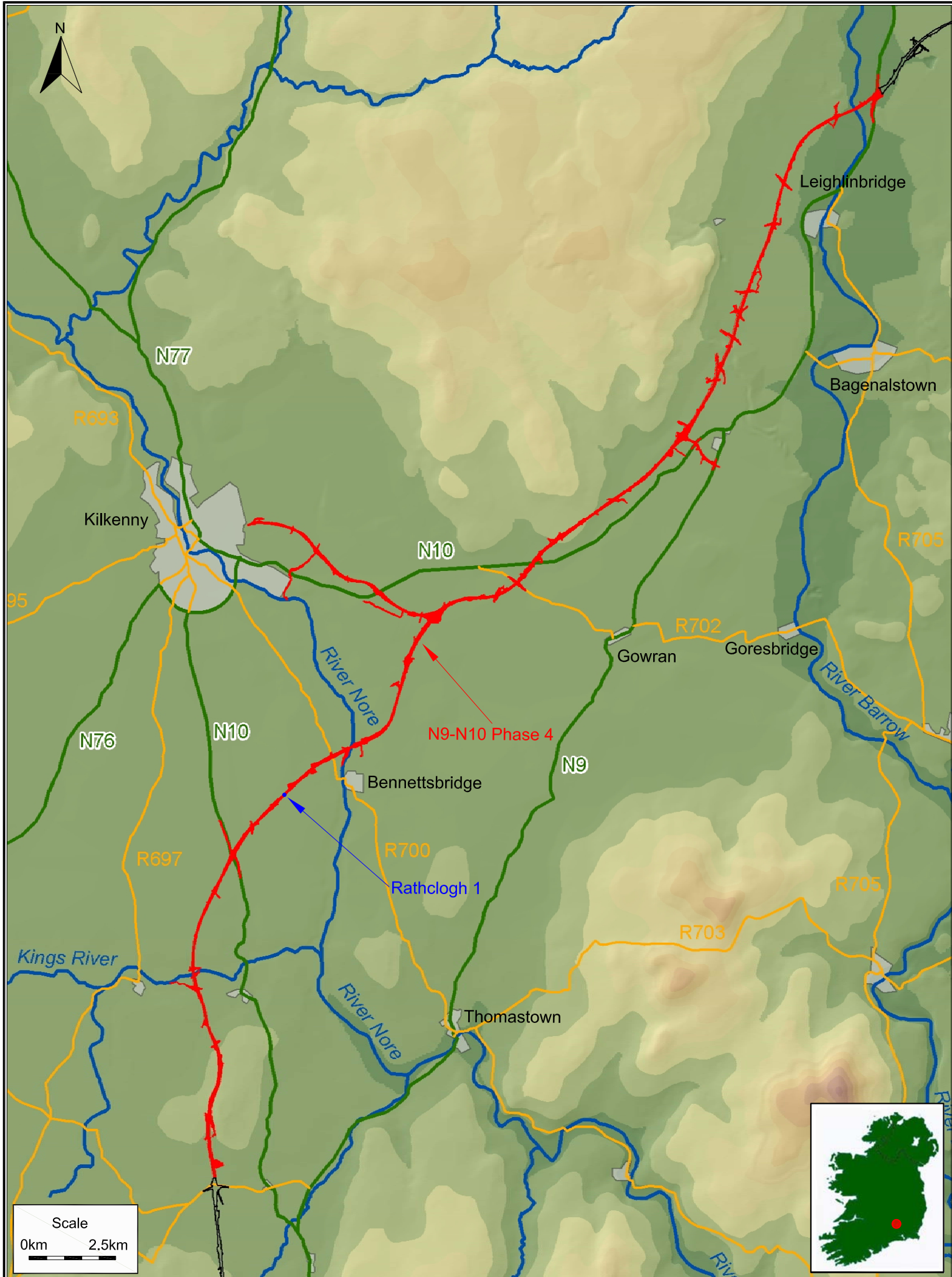
### 5.2 Other Sources

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

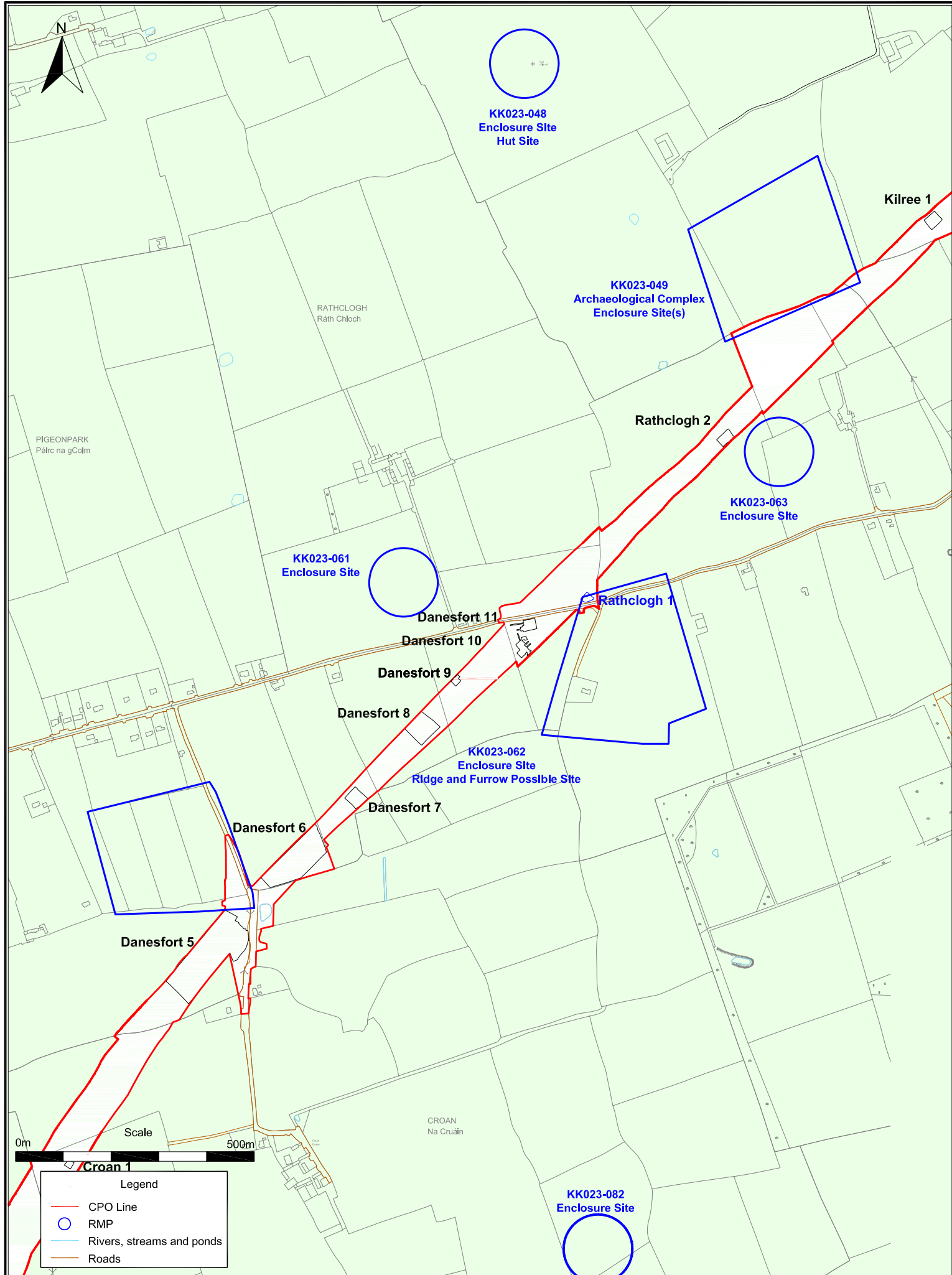
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### Electronic references

ENVision; *Environmental Protection Agency* Soil maps of Ireland  
<http://www.epa.ie/InternetMapView/mapviewer.aspx>









Rathclogh 1

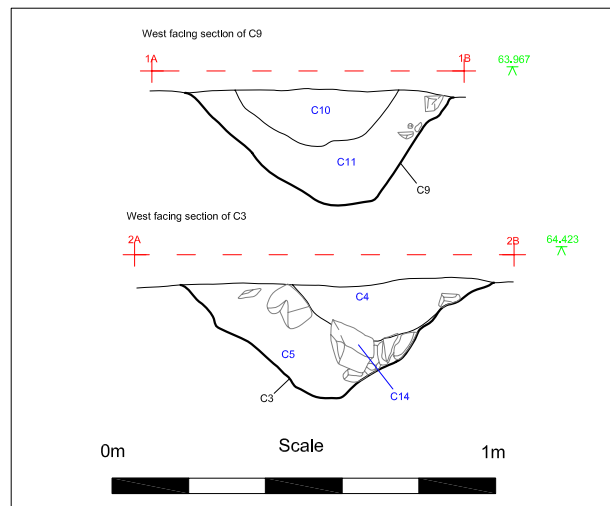


Scale  
0m 25m

Legend

- Waterways and ponds
- Roads
- Site Extents
- Field Boundary
- CPO





253355,  
+ 148519

253355,  
+ 148514

253360,  
+ 148514

64,071

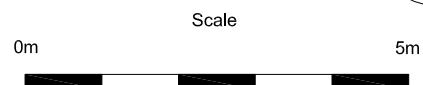
63,648

64,238

64,338

63,771

63,892



### Legend

- Break of slope
- - - Sections
- Cxx Cut numbers
- xxxxxxE National Grid Reference
- xxxxxxN
- Stone
- xx.xx Levels - metres OD

**IAC** Irish Archaeological  
Consultancy

Title: Rathclogh 1 - plan of site

Project: N9/N10 Phase 4: Knocktopher to Powerstown

Client: Kilkenny County Council

Scale: 1:100 @ A4

Date: 26/05/10

Produced by: G Kearney

Job No: J2432.1

Figure No: 4

## PLATES



Plate 1: Ballynolan 1, mid-excavation, facing north-east



Plate 2: Deposit C3, post-excavation, facing north



Plate 3: Ditch C10, mid-excavation, facing west

## 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
C1	N/A	N/A	N/A	0,25	Topsoil	Brown sandy clayey silt with small stones	N/A	C2
C2	N/A	N/A	N/A	N/A	Natural	Brownish yellow silty clay and small stones	C1	N/A
C3	N/A	0.9	0.82	0.04	Deposit	Friable compacted, black with brown lenses charcoal (80%) and coarse sand (20%)	C1	C2
C4	C10	9.0	3.5	0.9	Fill of ditch	Moderate to loose compaction, dark brown- black silty clay with charcoal inclusions	C1	C5
C5	C10	7.0	3.5	0.85	Fill of ditch	Compact, grey light brown redeposited clay with small stones	C1	C11
C6	C9	17.5	1.76	0.25	Top fill of ditch	Loosely compacted, dark greyish brown sandy silt with frequent charcoal flecks, moderate stones (up to 10cm)	C1	C7
C7	C9	17.5	1.06	0.20	Mid fill of ditch	Loosely compacted, mid brown clayey silt with occasionally charcoal and moderate stones(up to 15cm)	C6	C8
C8	C9	17.5	0.83	0.23	Bottom fill of ditch	Light brown silty clay with frequent stones (up to 15cm)	C7	C9
C9	N/A	17.5	1.76	0.52	Cut of ditch	Linear in shape, W-E, gentle break of slope- top, gradual break of slope- base, gradual sides and concave base	C8	C2
C10	N/A	11.0	7.0	1.2	Cut of ditch	Linear in shape, E-W, sharp break of slope- top, gradual break of slope- base and gradual sides, concave base	C11	C2
C11	C10	11.00	3.30	1.20	Fill of ditch	Moderate, mid brown redeposited clay with occasionally small stones and charcoal	C1	C10

## Appendix 1.2 Catalogue of Artefacts

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3755:001:1	1	1	Plate	Sherd of pearlware	Ceramic	An undecorated sherd of pearlware, possible from the base of a plate	N/A


## Appendix 1.3 Catalogue of Ecofacts

During post excavation works specific samples were processed with a view to further analysis. Two soil samples were taken from features at Ballynolan 1 and 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	Seeds & Hazelnut	Animal bone	Burnt animal bone	human bone	Shell	Other
C3	1	Charcoal deposit (poss. hearth)	98.4g						
C4	2	Ditch			6.8g				



## Appendix 1.4 Archive Index

<b>Project: N9/10 Phase 4: Knocktopher to Powerstown</b>		
<b>Site Name: Ballynolan 1 AR 160</b>		
<b>Excavation Registration Number: E3755</b>		
<b>Site director: Sinéad Phelan</b>		
<b>Date: 10.10.2007-19.10.2007</b>		
<b>Field Records</b>	<b>Items (quantity)</b>	<b>Comments</b>
Site drawings (plans)	2	
Site sections, profiles, elevations	2	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	0	
Site registers (folders)	1	
Survey/levels data (origin information)	56	
Context sheets	11	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	14	
Photographs (print)	0	
Photographs (slide)	0	
Security copy of archive	Yes	digitised

## **APPENDIX 2 SPECIALIST REPORTS**

Appendix 2.1 Medieval and Post-Medieval Pottery Report – Clare Mc Cutcheon

Appendix 2.2 Charcoal and Wood ID Report – Ellen O'Carroll

Appendix 2.3 Faunal Assemblage Report – Aoife McCarthy

## **Appendix 2.1 Post-Medieval Pottery Report – Clare McCutcheon**

**A NOTE ON THE POTTERY  
FROM  
BALLYNOLAN 1 (E3755)  
N9/N10 KNOCKTOPHER TO POWERSTOWN, CO. KILKENNY  
CLARE MCCUTCHEON MA MIAI**



**Introduction:**

A single sherd of pottery was presented for study, identified as pearlware.

**Pearlware:**

Wedgwood's development of creamware was further refined as pearlware, with a harder-fired clay and a blue rather than a green tinge in the collected glaze (Savage and Newman 1985, 216). This formed the basis for many decorative forms of the later 18th and 19th centuries such as shell-edged, mochware, transfer printed and sprigged wares.

The small sherd recovered is an undecorated piece, possible from the base of a plate.

**References:**

Savage, G and Newman, H 1985 *An illustrated dictionary of ceramics*. Thames and Hudson, London.

## **Appendix 2.2 Charcoal and Wood identification - Ellen O'Carroll**

**Client – Irish Archaeological Consultancy Ltd**

**Site Name- Ballynolan 1**

**Excavation number –E3755 AR160**

**County – Kilkenny**

**Author- Ellen O'Carroll**

**Date –30/8/09**

## Introduction

One charcoal sample was identified and analysed from excavations associated with a ditch at Ballynolan, Co. Kilkenny as part of the resolution of the N9/N10 Kilcullen to Waterford Scheme, Phase 4B – Rathclogh to Powerstown. Excavations revealed an east-west ditch measuring 6.7m in width with a depth of 1m traversing the site. A second, smaller ditch was also recorded and at the western side of the site a large area of burning was identified but represented a phase of clearance in the last century. This is likely to have occurred as part of land management (Phelan 2008). A deposit C3 was recorded 3m from the ditch and it was this deposit that the charcoal was analysed from. There is no date from these features and the author suggests that the features are post medieval in date.

Charcoal analysis is an important component of any post-excavation environmental work as it can help in re-constructing an environment hitherto lost to us, although this must be done with caution as sufficient sample numbers are required for a complete and full understanding of the immediate environment. Keepax suggest 50 charcoal samples in a European temperate climate (Keepax 1988). Charcoal and wood are also analysed and identified to determine what species are used and selected for particular functions on site i.e. post-holes, wall posts, firewood, burnt remains of wattle and other structural uses.

The results of the analysis from Ballynolan will later form part of an overall scheme-wide charcoal study for the N9/N10 (Lyons, O'Donnell & O'Carroll *forthcoming*).

## Methodology (After IAC Ltd)

### 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.

### Charcoal identification

The identification of charcoal material involves breaking the charcoal piece along its three sections (transverse, tangential and radial) so clean sections of the charcoal pieces can be obtained. This charcoal is then identified to species under a universal

compound microscope reflected and transmitted light sources at magnifications x 10-400. By close examination of the microanatomical features of the samples, the charcoal species are determined. Fifty fragments were identified from each sample, where possible.

A number of wood taxa cannot be identified to species or sub-species level anatomically. These include Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*); Hairy birch (*Betula pubescens* Ehrh) and silver birch (*Betula pendula* Roth) and English elm (*Ulmus procera*) and wych elm (*Ulmus glabra*), all of which are native to Ireland. In addition, taxa referred to as pomoideae in this report include apple, pear, hawthorn and mountain ash, which cannot be identified microscopically. There are also over 13 species of willow (*Salix* sp) and these species can-not be differentiated microscopically.

#### Details of charcoal recording

Each species was identified, bagged together and then weighed and each fragment counted. Insect channels and holes as well as fungal hyphae were noted on the charcoal fragments identified, as this may indicate the use of dead or rotting wood used for fuel or other such functions. The distinction can sometimes be made between trunks, branches and twigs if the charcoal samples are large enough. This was noted where possible by the presence of strongly or weakly curved rings. When charcoal samples showed indications of fast or slow growth this was also recorded. Finally the annual rings present on each charcoal fragment were counted.

### Results

Charcoal was examined from a deposit C3. The level of preservation within the charcoal assemblage was good and all fragments were identifiable. The weight and fragment count identified from each taxa type at each site is represented below in Figure 1 and Table 1.

Two wood taxa or tree types were identified from the Ballynolan samples. These were alder (*Alnus glutinosa*) and ash (*Fraxinus excelsior*) in order of representation. The results are dominated by alder where over 80% of the assemblage was identified as alder (Fig. 1).

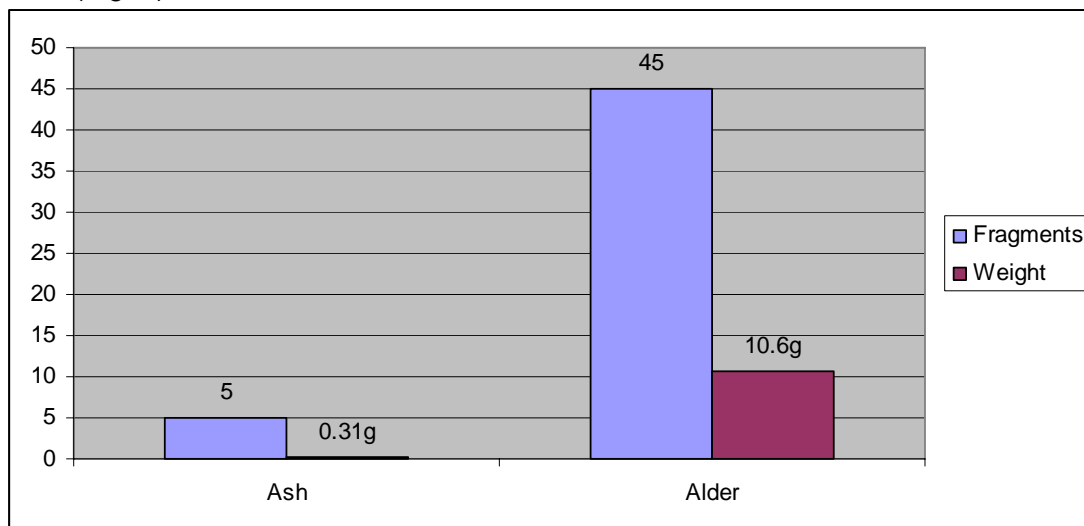


Fig. 1

### Discussion

Alder was the dominant taxon identified from the deposit C3. Five fragments of ash were also identified. The alder was brushwood in nature and may have been sourced

from an alder coppice woodland area. It is also possible that the deposit/ feature may be associated with a charcoal production pit of a late date. Several charcoal production pits of a late date and excavated along the N6 produced alder charcoal and were similar in nature and form to the deposit excavated at Ballynolan (unpublished N6 post excavation reports, 2008). Recent excavations along the many road schemes have produced a large quantity of isolated pits some of which may have functioned as charcoal production pits. Pits where one main taxon is identified from the charcoal remains suggests charcoal-burning pits. Charcoal-burning pits can in a lot of cases be isolated features and unassociated with any other structure types therefore the charcoal identifications can and has in the past helped the excavator in the interpretation of the site.

Alder is a widespread native tree and occupies wet habitats along stream and river banks. Though it certainly flourishes best where its main roots are just above the water, the alder is also tolerant of stagnant water. The wood of the tree is white when growing, but when it is cut, turns red. It is soft, with short fibres, giving it a homogeneous texture and of moderate density. It is a very durable wood and was specially selected for boat-making and for dug-out canoes, as it is an easily worked and split timber and therefore quite commonly manufactured into planks. As fuel the alder is inferior in heating power to other woods, but for this reason, it is useful where a slow heat is required.

Ash is a native species to Ireland preferring lime rich freely draining soils. It is not a very durable timber in waterlogged conditions but has a strong elastic nature and is easily worked. Ash appears to have colonised the open land after the first farmers removed much of the native woodland therefore it is frequently used as structural timber in the later Bronze Age periods. Ash is also abundant in native hedgerows and was quite common in the later historic period.

### Summary

Charcoal was examined from a deposit at Ballynolan. The results are dominated by alder with some ash wood also present. It is difficult to provide comparative material for the analysis at Ballynolan as the function and date of the deposit is unknown although a late date has been suggested for the deposit. The presence of the large quantities of alder brushwood may suggest a type of charcoal production pit with alder coppice wood being sourced and used. This interpretation may change when further post excavation analysis and dates are returned for the site.

Further analysis and discussions will be completed for the final integrated charcoal report for all analysed sites along the N9/N10 (Lyons, O'Carroll & O'Donnell, *forthcoming*).

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**Table 1** Charcoal identification details from Ballynolan

Context number	Sample number	Flot weight (grams)	Context description	Wood species	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Comments
3	1	98.4g	Deposit	<i>Fraxinus excelsior</i> (ash)	5	0.31g	1-3mm	2-3 rings	
				<i>Alnus glutinosa</i> (alder)	45	10.7g	3-20mm	2-8 rings	Strongly curved tree rings - brushwood

## **Appendix 2.3 Faunal remains – Aoife McCarthy**

**Osteoarchaeological Report of Faunal Remains from  
E3755: Ballynolan 1 AR160  
Co. Kilkenny  
N9/N10 Kilcullen to Waterford Scheme  
Phase 4b: Knocktopher to Powerstown  
Author: Aoife McCarthy MA BA  
Date: November 2009**

## **Table of Contents**

1. Introduction
  - 1.1 Introduction
  - 1.2 General Osteological Information
2. Methodology
3. Results
4. Summary
5. Bibliography



## 1. Introduction

### 1.1 Introduction

This report details the osteological analysis of faunal remains recovered during excavations at Site E3755 AR160 Ballynolan 1 in the townland of Ballynolan, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilkullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd. in November 2009. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Phelan, S. 2009) and from consulting the original site register documents.

### 1.2 General Osteological Information

The osteological analysis of faunal remains recovered from Site AR160 was undertaken to provide an overview of the osteoarchaeological aspect of the site and determine if the material could provide further interpretation of site activity.

A total of 10 fragments from 7 possible skeletal elements and weighing 6.50g were recorded within the assemblage. The degree of preservation of the animal bone assemblage recovered at Site AR160 was poor with a high degree of fragmentation and exposed trabecular or spongy bone.

The faunal remains assemblage recovered at Site AR160 Ballynolan 1 originated from a single archaeological context C4 the moderately compacted dark brown silty clay fill of linear ditch feature C10.

All ten bone fragments of the faunal remains assemblage were identified to species and element. The faunal remains assemblage recovered from Site AR160 Ballynolan 1 contained bones from a single species of cow.

## 2. Methodology

**SPECIES IDENTIFICATION:** Identification of the bones involved reference to Schmid (1972) and Hillson (1992) as well as comparison with the author's own reference material.

- **NISP:** Number of Identified Specimens Indicates the total number of fragments found.
- **MNI:** Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. Estimating MNI is calculated on the specimen of the most abundant skeletal element present; whilst taking age, sex, size and archaeological context into account.
- **MNE:** Minimum Number of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. To avoid getting a higher MNE all loose epiphyses have to be paired with all un-fused diaphysis.

**AGEING:** Two main methods are used to determine the age of faunal remains; tooth eruption and degree of Epiphysial fusion (a less reliable method). Tooth eruption and wear stages were recorded for the following teeth where possible; dP4 (deciduous fourth premolar), P4 (fourth premolar), M1 (first molar), M2 (second molar) and M3 (third molar) of cattle, sheep/goat and pig (Grant 1982). The analysis of tooth wear

patterns refers to the alteration of the enamel surface and exposure of inner dentine through use. The nature of faunal material recovered from site AR160 Ballynolan 1 meant ageing was not possible.

**BIOMETRICAL DATA:** Due to the high degree of fragmentation of the faunal remains recovered from Site AR160 measurements were not taken.

**SEX DETERMINATION:** Sex determination of animal remains is possible by analysis of certain sexually dimorphic elements. For example goat horncores may be classified as male or female based on their morphology and cattle metacarpals can be defined as male or female through calculation of the slenderness index (McCormick 1992). Sexual determination of species was not possible due to the high degree of fragmentation and the nature of the animal bone material recovered from Site AR160 Ballynolan 1.

**BUTCHERY/GNAWING/BURNING:** Evidence for butchery was recorded under the categories of cut, chopped, chopped and cut. All specimens were analysed for evidence of rodent or carnivorous gnawing as well as evidence of burning. Burnt bones were recorded in accordance with colour changes resulting from differing heat levels e.g. calcined bones acquire a bluish-whitish hue through exposure to high temperatures.

**PATHOLOGY:** The discovery of any injury and/or pathology was recorded for all specimens, where present.

### **3. Results**

#### **Context 4 Sample 2**

A total of 10 animal bone fragments (6.50g) representing 7 possible skeletal elements were identified within C4 the loosely compacted brown silty clay fill of linear ditch feature C10. All 10 bone fragments recovered from C4 were identified as bos/cow rib.

#### **Cow/Bos**

Cattle was the only animal species represented at Ballynolan 1, a total of 10 fragments forming 100% of the animal bone assemblage were recovered. The total weight of the recovered cattle bone was 6.50g. The cattle MNI was 3. The skeletal element of cow/bos present within the assemblage was rib. None of the recovered cow/bos bone fragments displayed evidence of butchery or gnawing. A single cow/bos rib fragment (1.3g) displayed evidence of exposure to heat, visible as colour change to chalky white of the internal trabecular bone. Bone structure changes through exposure to heat with a white or pale grey colour indicating exposure to temperatures in excess of c. 600°C combined with a ready oxygen supply (McKinley, 2004).

As detailed by Luff & Pearce in 1994 contact of bone with heat diminishes its moisture content and results in the combustion of the organic or collagen component; the remaining structure of the bone after this process is mineral. Such distortion to the bone structure reduces its size and as detailed above alters bone colour (Luff R. & Pearce J. 1994). Due to the lack of measureable bone fragments biometrical analysis was not possible for cattle bones recovered at Site AR160.

### **4. Summary**

Ten animal bone fragments recovered from linear ditch feature C10 on Ballynolan 1 were submitted for osteological examination. All 10 bone fragments were identified

and divided into species. The faunal remains assemblage contained bones from a single recognisable species of cow.

Taphonomic alterations noted on the faunal remains give us an insight into the processes that the assemblage went through before recovery. As illustrated in the bone database and above a single cow/bos rib fragment displayed evidence of exposure to a high level of heat in the form of bone colour change to white.

The entire faunal remains assemblage was retrieved from a single archaeological context which has been interpreted as a linear ditch feature. No definite or statistically detailed conclusions could be drawn from the faunal remains assemblage retrieved from Ballynolan 1, due to its limited size, level of fragmentation and poor degree of preservation. No finds were recovered from linear ditch feature C10 containing animal bone sample 2

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#### **GLOSSARY OF TERMS:**

**BOS:** Latin term for Cow

**SUS:** Latin term for Pig

**CERVUS:** Latin term for Deer

**EQUUS:** Latin term for Horse

**OVIS:** Latin term for Sheep

**CAPRINAE:** Latin term for Sheep/Goat

**CANIS:** Latin term for Dog

**LEPUS:** Latin term for Hare

**AVES:** Latin term for Bird

**TAPHONOMY:** The study of the processes affecting an organism after death from the time of burial until collection.

**TRABECULAR BONE:** Osseous tissues that fill the interior cavity of bones and resemble a sponge or honeycomb.

**DIAPHYSIS:** Bone shaft

**CORPUS COSTAE:** Body of Rib Bone

**Bone Database:**

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	Weight (g)	Comments
1	C4	2	Cow size	Rib									1				W		1	1.30	Poorly preserved fragment of cow size rib corpus costae, trabecular bone exposed. Evidence of mild burning visible on internal bone surface
2	C4	2	Cow size	Rib								1							1	1.30	Poorly preserved fragment of cow size rib corpus costae, trabecular bone exposed.
3	C4	2	Cow size	Rib								1							1	0.70	Poorly preserved fragment of cow size rib corpus costae, trabecular bone exposed.
4	C4	2	Cow size	Rib								1							1	0.60	Poorly preserved fragment of cow size rib corpus costae, trabecular bone exposed.
5	C4	2	Cow size	Rib							1								2	0.80	Poorly preserved fragments of cow size rib corpus costae, trabecular bone exposed
6	C4	2	Cow size	Rib									1						2	1.00	Poorly preserved fragments of cow size rib corpus costae, trabecular bone exposed
7	C4	2	Cow size	Rib									1						2	0.80	Poorly preserved fragments of cow size rib corpus costae, trabecular bone exposed

**Key:**

C= Context

S=Sample

Anat=Anatomical Element

Prox=Proximal

But=Butchery

Bu=Burnt

G=Gnaw

Q=Quantity of Pieces

W=White

Unid=Unidentifiable

Taxa=Taxon

Dist=Distal

**APPENDIX 3 LIST OF RMPS IN AREA**

<b>RMP No</b>	<b>Description</b>
CW015-003	Enclosure
CW015-010	Earthwork – possible
CW015-011	Enclosure
CW015-012	Enclosure
CW015-013	Redundant record
CW015-014	<i>Fulacht fiadh</i>

See Figure 2 for detail.

## 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 1	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
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449

Site Name	Site Code	E Number	Director	NGR
Blanchillespark 3	AR109	E3913	Tim Coughlan	260785/155653
Blanchillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchillespark / 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
Leggetsraeth 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
Stonecarthy West 2	UA2	E3974	Tim Coughlan	251372/142037
Rathduff Bayley 1	UA4	E4011	Tim Coughlan	251005/143564