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

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3850
Site Name	AR131, Shankill 5
Townland	Shankill
County	Kilkenny
Excavation Director	Richard Jennings
NGR	266374 161730
Chainage	67315

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

AUGUST 2012

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	E3850
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	AR131, Shankill 5
Site Type	Possible remnants of prehistoric structure
Townland(s)	Shankill
Parish	Shankill
County	Kilkenny
NGR (easting)	266374
NGR (northing)	161730
Chainage	67315
Height OD (m)	59.061
RMP No.	N/A
Excavation Dates	6–19 December 2007
Project Duration	20 March 2007–18 April 2008
Report Type	Final
Report Date	August 2012
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 AR131, Shankill 5 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 E3850 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between the 6 and 19 December 2007.

The excavation at Shankill 5 has identified a possible small, temporary structure based around two short linear alignments of postholes that had the appearance of being set into slot-trenches. It is possible that there was no definitive slot but that the setting of the posts immediately adjacent to one another created a linear void. The postholes would have held round vertical posts with a larger post placed at the west end of each alignment. The slot-trench alignments were 1.70m long and orientated east-west. The slot-trenches/post alignments were 1.10m apart and there was no evidence that they were truncated by later activity at either end. To the west of the slot-trenches there were four possible postholes in a sub-rectangular or trapezoidal plan, that may have been related to the main structure. Three small stakeholes to the south and a further one to the east of the structure may or may not be related. Immediately southwest of the slot trenches there was an oval pit which contained a piece of flint debitage, charcoal, hazelnut shell fragments, burnt bone fragments and heat shattered stone. The varied material within the fill could suggest it was a waste pit associated with domestic settlement. It was dated to the early Iron Age. It is thought likely that the slot trenches, pit and other features in the immediate vicinity are likely to all be contemporary. A number of other pits on the periphery of the structure may be further waste pits although the largest pit on the site contained unburnt stones and may be a soak pit or associated with land clearance. In the north of the site a charcoal rich pit was interpreted as being a waste pit, possibly from a hearth, as there was no evidence of *in situ* burning. It was dated to the medieval period and clearly represents a separate phase of activity to the Iron Age structure.

Artefacts from the site consisted predominantly of lithics which may be residual from earlier prehistoric activity in the wider area, although no definitive evidence of early prehistoric activity was identified from the site. Of particular interest were a worn sherd of Beaker pottery and an early Neolithic polished stone axe that were found within the topsoil or clearance layers. As these are not from secure contexts they must be regarded as stray finds and cannot be directly linked to any phase of activity on the site.

A total of two samples were sent for AMS radiocarbon dating. The results of the analysis dated hazel charcoal from the fill C62 of a hearth. The 2 sigma calibrated date was AD1399–1436 (UBA 12239). The results of the analysis also dated hazel charcoal from the fill C34 of a pit and the 2 sigma calibrated date was 791–547BC (UBA 15417).

The archaeology at Shankill 5 represents a temporary settlement that may be related to small scale burnt mound activity that has been dated to the early Iron Age. Evidence from the archaeological landscape confirms that this area was not intensely settled in prehistory and was associated with small temporary settlement and burnt mound sites. The nature and date of the findings at Shankill 5 are important locally as it confirms the nature of the landscape in the early Iron Age.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Shankill 5, AR131 (Figure 1), in the townland of Shankill 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 1531m^2 and was first identified during testing carried out between 27 March and 6 April 2007 by Richard Jennings (E3364) for IAC Ltd. on behalf of the National Roads Authority. Shankill 5 was excavated between the 6 and 19 December 2007 with a team of one director 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.

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 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

The site was located in a corner of a pasture field on land with a gentle north-east aspect. Hedgerows to the south and west partially obscured views of the north Kilkenny hills (Plate 1) while the land was more open to the north and east where the Blackstairs Mountains are prominent on the horizon. The nearest water source was a stream 200m to the north. This stream also serves as the Kilkenny–Carlow county boundary (Plate 2) and feeds into an upper tributary of the River Barrow. Shankill 4 is situated *c*. 150m directly to the south and Shankill 6 is located *c*. 100m to the NNE. A hearth (KK016-002) is recorded *c*. 600m to the south-west.

2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Orange-yellow sandy clay	Subsoil

The geology at the site consisted of an orange-yellow sandy clay with interspersed gravelly-sand concentrations. In this regard it was typical boulder clay.

2.2 PHASE 2 Early Iron Age Activity

A cluster of activity was identified in the centre of the site consisting of a possible slot-trench structure, postholes and pits. Only one of the pits (C33) was dated to the early Iron Age and it is possible that the other features are not contemporary, however in the absence of evidence to the contrary, it is interpreted that this activity was all probably broadly contemporary particularly given the small cluster of features.

2.2.1 Slot-trench Structure

A possible structure was identified in the centre of the site characterised by two slot trenches that each contained a series of postholes, in addition to four other postholes, three stakeholes, a pit and two spreads. Because the slot-trenches consisted of a series of intercutting postholes each slot-trench was assigned a series of cut and fill numbers relating to these postholes and their fills (Figure 5; Plates 1–3).

2.2.1.1 Slot-trench 1

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C39	N/A	0.55	0.36	0.2	Oval-shaped cut	Cut of posthole/pit
C40	C39	0.55	0.36	0.1	Mid-brownish grey clayey silt	Fill of posthole/pit
C41	N/A	0.28	0.26	0.2	Round cut	Cut of posthole
C42	C41	0.28	0.23	0.2	Dark brownish grey clayey silt	Fill of posthole
C43	N/A	0.4	0.2	0.13	Linear cut	Cut of posthole
C44	C43	0.4	0.2	0.13	Mid/dark brownish grey clayey silt	Fill of posthole
C55	N/A	0.18	0.16	0.18	Round cut	Cut of posthole
C56	C55	0.18	0.16	0.18	Light brownish grey clayey silt	Fill of posthole
C57	C39	0.28	0.26	0.1	Mid-greyish brown clayey silt	Fill of posthole/pit
C91	N/A	0.28	0.26	0.19	Oval cut	Cut of posthole
C92	C91	0.28	0.27	0.19	Mid-brownish grey clayey silt	Fill of posthole

Finds

Context	Find Number	Material	Period	Description
C40	E3850:40:1	Flint	Early Neolithic	1 piece flint debitage

Slot-trench 1 consisted of four medium-sized postholes at its east end, C91, C41, C43, C55, and one larger pit or posthole at its western end, C39. There was possibly a fifth small posthole between C39 and C91. The slot was 1.8m x 0.3m at the point where it joined C39. The four postholes were deliberately cut in close proximity to each other so that combined they formed a slot-trench. The base of the postholes

were rounded to suggest that a line of four complete round posts (rather than half or split timbers) were set together. Four separate fill numbers were assigned to the postholes because they were initially half-sectioned north-south independently of each other. Apart from varying slightly in colour there was no real difference between the fills and it is probable that they silted up at the same time after the posts had been removed. There was no evidence that any of the timbers had survived *in situ* nor was it possible to identify any type of packing material.

A piece of flint debitage (040:1) was recovered from the pit/ posthole fill C40; suggesting that flint knapping took place on site (Sternke, Appendix 2.2).

Charcoal was recovered from the posthole/ pit fills C40 and C42 during post-excavation soil flotation and subsequently identified to species. A variety of species were identified including small amounts of ash *(Fraxinus* sp), hazel *(Corylus avellana)*, wild/ bird cherry *(Prunus avium/padus* sp), elm (*Ulmus* sp.), alder (*Alnus* sp.) charcoal fragments and oak (*Quercus* sp.) charcoal fragments. The samples were overwhelmingly dominated by oak, which could suggest the original posts were made from oak (O'Donnell, Appendix 2.3).

A total of 13 fragments of burnt bone were identified from posthole fill C42. Due to poor preservation and small fragment size it was not possible to identify the burnt bone fragments to species. All 13 fragments displayed modifications consistent with exposure to a high level of heat and resulting calcination (McCarthy, Appendix 2.5).

A sample of stones from the posthole/ pit fills C40 and C57 was analysed and identified as not altered, angular, very coarse grained quartz rich, red/ yellow sandstone. Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles (Mandal, Appendix 2.6).

2.2.1.2 Slot-trench 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C35	N/A	0.59	0.68	0.25	Irregular oval cut	Cut of posthole/pit
C36	C35	0.59	0.68	0.16	Mid-brownish grey clayey silt	Fill of posthole/pit
C37	N/A	0.25	0.3	0.1	Linear cut	Cut of posthole
C38	C37	0.25	0.3	0.09	Mid-brownish grey clayey silt	Fill of posthole
C83	N/A	0.26	0.26	0.12	Round cut	Cut of posthole
C84	C83	0.25	0.26	0.11	Mid-brownish grey clayey silt	Fill of posthole
C85	N/A	0.18	0.22	0.13	Round cut	Cut of posthole
C86	C85	0.18	0.22	0.11	Mid-brownish grey clayey silt	Fill of posthole
C87	N/A	0.18	0.19	0.11	Round cut	Cut of posthole
C88	C87	0.18	0.19	0.1	Mid-brownish grey clayey silt	Fill of posthole
C89	N/A	0.19	0.19	0.1	Round cut	Cut of posthole
C90	C89	0.18	0.2	0.09	Mid-brownish grey clayey silt	Fill of posthole
C106	C35	0.35	0.4	0.25	Dark grey clayey silt	Fill of posthole/pit

Finds: None

Slot-trench 2 was almost identical to Slot-trench 1 which was located 1.1m to the north (Figure 5; Plates 1–3). Its overall length was 1.7m and its width ranged from 0.2–0.7m where it opened out at the western end into pit/posthole C35. As was evident at the west end of Slot-trench 1, C35 was significantly larger than any of the alignment of posts located to the east. Five probable postholes were identified within the slot to the west of C35: C37, C83, C85, C87 and C89. As with the postholes in Slot-trench 1, the fill of each posthole was recorded as a separate context but the fills

were virtually identical and had almost certainly in-filled at the same time. There was no evidence of any associated packing material

Seven charred hazelnut fragments and two barley (*Hordeum* species) grains of indeterminate species were recovered from the posthole/ pit fill C66. The cereal remains from this site were recovered in such small quantities that it is not possible to determine the relative importance of the various different types found in these deposits. Hazelnut shell fragments are probably over-represented in archaeobotanical assemblages, in relation to its general importance in the plant economy. The hazelnut shell fragments from this site are therefore of limited interpretative significance (Johnston, Appendix 2.4).

Seven fragments of burnt bone were identified from posthole fill C36. Due to poor preservation and small fragment size it was not possible to identify the burnt bone fragments to species. All seven bone fragments displayed evidence of exposure to a high level of heat resulting in calcinations (McCarthy, Appendix 2.5).

It is clear that Slot-trench 1 and Slot-trench 2 were related to each other because they were of similar design, had the same type of fill, were approximately 1m apart, and were almost parallel on the same west–east axis (Figure 5; Plates 1–3). The space between the two slots was 1.1m wide narrowing at the western end to 0.6m where the larger pits/postholes were located. The two features appeared to be complete and were not just the remnants of longer slot-trenches. The presence of the larger pits at the western ends seemed to indicate that the slots ended at this point. The terminal postholes at the eastern ends of the slot-trenches had steep sides and were of significant depths and did not appear to have been truncated.

2.2.1.3 Postholes

The remnants of four shallow possible postholes were found between 3.2m – 6m to the west of the slot-trenches.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	0.24	0.17	0.04	Oval cut	Cut of posthole
C4	C3	0.24	0.17	0.04	Mid-greyish brown silty clay	Fill of posthole
C5	N/A	0.44	0.42	0.07	Circular cut	Cut of posthole
C6	C5	0.44	0.42	0.07	Greyish light brown silty clay	Fill of posthole
C11	N/A	0.33	0.3	0.13	Circular cut	Cut of posthole
C12	C11	0.33	0.3	0.13	Dark grey silty clay with five stones	Fill of posthole
C13	N/A	0.21	0.21	0.1	Circular cut	Cut of posthole
C14	C13	0.21	0.21	0.1	Greyish/blackish mid-brown silty clay	Fill of posthole

Finds: None

These four possible postholes formed a trapezoid / rectangular shape in plan that measured 2.20m by 1.10m and was orientated northwest southeast (Figure 5, Plate 7). They were all filled with silty clay material and contained no finds. C3 and C5 were very shallow with flat bases. C11 was marginally deeper and contained five angular small to medium sized stones (0.03–0.1m maximum dimensions) circling its base. These were possibly the remnants of packing stones for a post-pipe although given the gravelly nature of the subsoil in this area, it is possible that these were simply part of the infill. Posthole C13 had an irregular base and unlike the other three, its fill contained traces of burnt bone.

Plant remains were recovered and identified from the posthole fill C12. A single wheat *(Triticum* L. species) grain was identified (Johnston, Appendix 2.4).

Fragments of burnt bone were identified from posthole fills C12 (6 fragments) and C14 (8 fragments). Due to poor preservation and small fragment size it was not possible to identify the burnt bone fragments to species. All 14 bone fragments displayed evidence of exposure to a high level of heat resulting in calcinations (McCarthy, Appendix 2.5).

2.2.1.4 Pit C33 and Deposits C48 and C50

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C33	N/A	1.3	0.75	0.14	Oval cut	Cut of pit
C34	C33	1.3	0.68	0.14	Dark greyish brown clayey silt	Fill of pit
C48	N/A	0.3	0.3	0.02	Yellowish brown clay silt	Occupation layer?
C50	N/A	0.5	0.3	0.02	Yellowish brown clay silt	Occupation layer?

Finds

Context	Find Number	Material	Period	Description
C34	E3850:34:1	Flint	Early Neolithic	1 piece flint debitage
C48	E3850:048:1	Chert	N/a	Natural chunk
C50	E3850:050:1	Chert	Early Neolithic	chert flake
C50	E3850:050:2	Chert	N/a	Natural chunk

Immediately south of the slot trenches there was an oval pit and two small spreads/deposits. The pit was of a similar depth to the adjacent Slot-trench 2, to which it was almost conjoined. Its fill contained frequent charcoal pieces and occasional angular small and medium-sized stones.

The remnants of a possible occupation spread were identified on the site to the south of Slot-trench 2 and were represented by two patches of material (Figure 5). The larger of the two was C50. It extended over an area measuring 0.5m x 0.3m and was located 0.5m to the south of Slot-trench 2. C48 was 1m south of the slot-trench.

A piece of flint debitage (034:1) was recovered from the pit fill C34; suggesting flint knapping took place on site. A chert flake (050:1) was recovered from the occupation layer C50. It was produced using the single-platform method and dates to the early Neolithic period based on the technology. Two other pieces of chert from C48 and C50 were identified as natural chunks (Sternke, Appendix 2.2). The Neolithic chert may be residual from activities outside the limits of the site as there was no evidence of early Neolithic activity from the site.

Charcoal was recovered from the pit fill C34 during post-excavation soil flotation and subsequently identified to species. A variety of species were identified including ash *(Fraxinus* sp), hazel *(Corylus avellana)*, wild/ bird cherry *(Prunus avium/padus* sp), elm (*Ulmus* sp.) oak (*Quercus* sp.) alder (*Alnus* sp.) and birch (*Betula* sp.) charcoal fragments. This variety of taxa could indicate that this deposit was originally a hearth or firing area (O'Donnell, Appendix 2.3).

Three charred hazelnut fragments and one indeterminate cereal grain were recovered from the pit fill C34. Hazelnut shell fragments are probably over-represented in archaeobotanical assemblages, in relation to its general importance in the plant economy. The hazelnut shell fragments from this site are therefore of limited interpretative significance (Johnston, Appendix 2.4).

Thirty-eight fragments of burnt bone were identified from pit fill C34. Due to poor preservation and small fragment size, it was not possible to identify the burnt bone fragments to species. All 38 bone fragments displayed evidence of exposure to a

high level of heat resulting in cracking and splitting of the bone surface (McCarthy, Appendix 2.5).

A sample of stones from the pit fill C34 was analysed and identified as burnt, sub-rounded to angular, coarse grained, red sandstone. Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site (Mandal, Appendix 2.6). The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles (Mandal, Appendix 2.6).

2.2.1.5 Stakeholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C21	N/A	0.1	0.1	0.18	Circular cut	Cut of stakehole
C22	C21	0.1	0.1	0.18	Greyish brown silty clay	Fill of stakehole
C23	N/A	0.06	0.06	0.04	Circular cut	Cut of stakehole
C24	C23	0.06	0.06	0.04	Light grey silty clay	Fill of stakehole
C79	N/A	0.07	0.07	0.11	Circular cut	Cut of stakehole
C80	C79	0.07	0.07	0.11	Dark greyish black silty clay	Fill of stakehole
C100	N/A	0.1	0.09	0.08	Circular cut	Cut of stakehole
C101	C100	0.1	0.09	0.08	Dark brownish black clayey silt	Fill of stakehole

Finds: None

A group of three stakeholes, C21, C23 and C79, was found 3m south-west of Slot-trench 1, and a fourth stakehole, C100, was found 3m to the east (Figure 5).

Three of the four stakeholes found on the site were located less than 1.2m apart so it is suggested that they were associated with the same type of activity on the site, although no evidence was found to elucidate what that activity might have been. The stakeholes varied in depth and width and were probably formed through the direct pushing of stakes into the ground. They did not appear to form a structure. The sides of C21 and C79 were vertical and the bases U-shaped, while the shape of C23 was considerably more difficult to establish. They had silted up with a grey clay deposit. Their proximity to the slot-trench structure may indicate that they were related to this activity.

2.2.2 Other Pits/Features

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C9	N/A	0.66	0.33	0.08	Oval cut	Cut of pit
C10	C9	0.66	0.33	0.08	Mid-greyish brown silty clay	Fill of pit
C58	C59	0.76	0.45	0.18	Greyish brown clayey silt	Fill of pit
C59	N/A	0.76	0.45	0.18	Oval cut	Cut of pit
C60	N/A	2.2	1.8	0.7	Sub-oval cut	Cut of pit
C61	C60	2.2	1.8	0.26	Light yellowish brown clayey silt	Fill of pit
C81	C60	1.96	1.7	0.2	Light yellowish grey silty clay	Fill of pit
C82	C60	1.95	1.6	0.47	Stones	Fill of pit
C105	C60	1.7	1.4	0.18	Dark grey clayey silt	Fill of pit

Finds

Context	Find Number	Material	Period	Description
C10	E3850:10:1	Flint	Early Neolithic	Heavily patinated flint flake
C59	E3850:59:1	Ceramic	Post-Medieval	Clay pipe

Three pits were found on the site, away from the possible slot-trench structure (Figure 5). The largest was C60, which contained a substantial dump of stones. The smallest, C9, appeared to be related to the four postholes west of the slot-trenches

as it was in the same area and contained a similar fill. Pits C58 and C60 were located 3m to the north of the slot-trenches and the postholes.

Large pit C60 was irregular in shape but had a basic sub-oval plan with moderate to steep sloping sides and a generally flat base. The primary fill of the pit consisted of C105, a compact, dark-grey, clayey silt with occasional stones. This was sealed by C82, a significant dump of stones set within a yellowish grey clay matrix (Figure 6; Plates 4–6). The largest of the stones measured 0.49m x 0.36m x 0.18m and the smallest 0.11m x 0.08m x 0.03m. They were mostly concentrated in the eastern half of the pit where the largest of the stones was set. They may not have been randomly deposited as they appeared to have been placed around the largest stone, particularly on the west side. The stones were mostly limestone and were similar to those observed in the surrounding subsoil. The stones were partially sealed by grey clay layer C81, which in turn was sealed by C61, a clay silt deposit with frequent small and angular stones. The function of the pits is unclear but it may represent a soak pit or be associated with clearance.

Shallow oval pit C59 was located 1m to the north of stone-filled pit C60. A piece of clay pipe was found in the upper part of the fill at the interface with the topsoil and may have been intrusive. The fill contained occasional charcoal flecks. Its function is unknown but given its proximity to C60 it was probably related to this feature.

Pit C9 was oval and of a similar depth to nearby postholes C3 and C5. It was so shallow that it was difficult to detect its shape after excavation. Nevertheless, it was of particular interest because a flint flake was recovered from its fill. Occasional charcoal flecks were also noted.

A flake made of flint (010:1) was recovered from the pit fill C10. It was produced using the single-platform method and a soft hammer was used. The flake dates to the early Neolithic period based on the technology (Sternke, Appendix 2.2). No features dated to the early Neolithic were recorded on or near the site so this artefact could be residual from activity dated to the early Neolithic in the vicinity of the site.

2.3 PHASE 3 Medieval Activity

2.3.1 Hearth Waste Pit C63

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C63	N/A	0.75	0.6	0.06	Oval cut	Cut of pit/ hearth
C62	C63	0.75	0.6	0.06	Dark greyish reddish black clayey silt	Fill of pit/ hearth

Finds: None

This feature was located 7m north of the slot-trenches and the other features on the site and was isolated from the earlier activity (Figure 5). Pit C63 contained pieces of baked clay and frequent charcoal inclusions but there was no evidence for *in situ* burning, e.g. scorching on the sides of the pit. It was perhaps a hearth that burned at a relatively low temperature or a rubbish pit that was filled with hearth waste.

Charcoal was recovered from the pit/ hearth fill C62 during post-excavation soil flotation and subsequently identified to species. A variety of species were identified including smaller amounts of ash *(Fraxinus* sp) and hazel *(Corylus avellana)* charcoal fragments and eighty oak (*Quercus* sp.) charcoal fragments from both samples of C62 analysed. Overall, the results are dominated by oak, so it is likely that oak stands or woodlands were growing near to the site. Oak is frequently identified from

Irish archaeological sites. It is a strong, robust timber, which burns well at high temperatures (O'Donnell, Appendix 2.3).

Two charred hazelnut *(Corylus avellana)* fragments were recovered from the pit/ hearth fill C62. Hazelnut shell fragments are probably over-represented in archaeobotanical assemblages, in relation to its general importance in the plant economy. The hazelnut shell fragments from this site are therefore of limited interpretative significance (Johnston, Appendix 2.4).

A fragment (0.39g) of hazel *(Corylus avellana)* charcoal was chosen for AMS dating and returned a result of 523±18 (UBA 12239). The 2 sigma calibrated date for this was AD1399–1436 (QUB, Appendix 2.7) dating this feature to the medieval period.

2.4 PHASE 4 Topsoil and Plough Soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1				0.3-0.5	Soft light greyish brown sandy silt	Topsoil

Finds

Context	Find Number	Material	Period	Description
C1	E3850:01:1	Chert	Early Neolithic	Slightly weathered polished stone axe
C1	E3859:01:2	Pottery	Beaker period	1 worn necksherd Beaker pottery

The topsoil varied in depth from 0.3–0.5m. A piece of prehistoric pottery and a prehistoric stone axe were found in the topsoil at the interface with the subsoil when the site was being cleaned back by hand

The excavation yielded a single, much worn necksherd (001:2) of buff fabric from a final Neolithic/ early Bronze Age Beaker. The fine, well-fired fabric has a medium content of quartzite inclusions. While very little else can be determined from such a small quantity it is possible that the decoration is arranged in horizontal bands (Grogan, Appendix 2.2).

A polished stone axe (001:1) was recovered in topsoil and is made of chert and survives in an almost complete condition. It sustained damage to its cutting edge and is a thin-butted example. It is a characteristic early Neolithic artefact (Sternke, Appendix 2.2).

The presence of these artefacts within the topsoil does indicate the potential for early Neolithic and Beaker activity in the area and as such they are of importance. However, these are stray finds from the site that are not from a secure context and in themselves do not indicate that activity from either period existed within the area of Shankill 5.

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Shankill 5. 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 – compile 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 Slievenamon (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 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

Portarlington, 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. Shankill 5 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 17th 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 was located in a corner of a pasture field on land with a gentle north-east aspect. Hedgerows to the south and west partially obscured views of the north Kilkenny hills (Plate 1) while the land was more open to the north and east where the Blackstairs Mountains are prominent on the horizon. The nearest water source was a stream 200m to the north. This stream also serves as the Kilkenny–Carlow county boundary (Plate 2) and feeds into an upper tributary of the River Barrow. Shankill 4 is situated *c*. 150m directly to the south and Shankill 6 is located *c*. 100m to the NNE. A hearth (KK016-002) is recorded *c*. 600m to the south-west.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Shankill 5, 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 Shankill 5 has been identified as being early Iron Age and medieval in date, although residual and stray artefacts from the site date to the Neolithic and Beaker period, no definitive evidence for activity dating to either period in earlier prehistory was identified at the site.

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

As with wider settlement patterns in Ireland, direct evidence for Iron Age (800BC–AD500) domestic habitation was not identified, although several furnaces, kilns and ringditches date to this period and attest to an Iron Age presence in the area. It is possible that some smaller Iron Age ringditches were in fact structural, rather than funerary. Evidence for Iron Age domestic settlement activity remains indirect and peripheral in Kilkenny and Carlow, and in Ireland as a whole.

The Southern Landscape

Direct evidence of Iron Age activity in the southern landscape of the N9/N10 Phase 4 is limited. There is a marked absence of hillforts from south Kilkenny but this does not necessarily infer absence of settlement (Gibbons 1990, 20). A small number of features produced Iron Age dates in this landscape as a result of the N9/N10 Phase 4 excavations. A posthole dating to this period (165BC–AD16; UBA 10984) was excavated at Baysrath 2, and belongs to a possible structure indicating potential domestic settlement in the region. At Tinvaun 2 a possible hut structure was identified which consisted of four truncated slot-trench-like pits, a posthole and a shallow, roughly central pit in the interior of the area. Dates returned for this possible structure have indicated that it was in use during the Iron Age period (AD5–124; UBA 12169). There was also some metalworking activity on site and this structure may have been associated with it. Further to this, a posthole and a hearth excavated at Danganbeg 1 also dated to the Iron Age (762–416BC and 41BC–AD55; UBA 14025 and UBA 14024 respectively). No funerary features belonging to the Iron Age were excavated as part of the present Phase 4 in the southern landscape. However, some metal working activity in the form of slag pits/furnaces and funerary activity in the form of a ringditch has been excavated at Baysrath directly to the south of the present excavations and have been dated to the Iron Age period (Channing 2007).

Three circular structures excavated at this site have also been dated to this period (AD60–131, AD25–128 and 88BC–AD53; UBA 10684, UBA 10685 and UBA 10691 respectively) indicating a strong Iron Age presence in this area (*ibid.).* A ditch dating to the Iron Age (39BC–AD74; UBA 10993) was excavated at Tinvaun 1; burnt mound activity associated with the Bronze Age was also excavated at this site and this ditch relates to a later phase of activity at the site. At Knockadrina 2 (51BC–AD78; UBA 12178) an Iron Age furnace was excavated and at Stonecarthy West 1 a possible trough also yielded an Iron Age date (771–539BC; UBA 12174), however other features associated with a burnt mound on the site returned Bronze Age dates.

The Central Landscape

As with the southern landscape there is no direct evidence for Iron Age settlement although there are many early medieval RMP sites in this area, the majority of which are ringforts and enclosure sites, such as the ringforts recorded at Woolengrange (KK024-079 and KK024-082) and the enclosures at Carran (KK024-021001, 2) . Iron Age activity in the county is represented by the Hillfort at Freestone Hill where a defensive hillfort and inner enclosure (KK020-018002) was built encircling the hill-top (Gibbons 1990, 18), re-using the site of an earlier burial cairn (KK020-018001). The site was then re-occupied *c*. AD300 (Raftery 1969). Another possible Iron Age hillfort is located at Cotterallsrath located to the west of the southern end of this central landscape. Directly to the north-east of this site and located four miles south of Kilkenny City are the remains of a linear earthwork at Grevine West (Gibbons 1990, 20), also indicating an Iron Age presence in the region. Additionally, excavations were carried out at two ringforts in the townland of Dunbell; Dunbell 6 in 1972 and Dunbell 5 (KK024-010) in 1990 (Foley 1974; 2006; Cassidy 1991). The ringfort settlement at Dunbell 5 in particular produced dates from the Bronze Age to the eighth–10th centuries AD including evidence of Iron Age occupation.

Two clusters of Iron Age activity were noted from the N9/N10 excavations within the central landscape, at Danesfort and at Kilree and Holdenstown. These sites exhibited evidence for funerary activity and no evidence for domestic settlement was uncovered within this central landscape. At Danesfort 13 the primary fill of a ringditch returned a radiocarbon date of 503–384BC (UBA 10999) and was considered to be associated with two similar ringditches excavated at the neighbouring site of Danesfort 12. A fine glass bead found within a pit at Danesfort 13 also indicated that Iron Age activity continued in the Danesfort area, confirming the longevity of Danesfort as a focus for prehistoric funerary activity and although the area continued to be occupied in the early medieval period the focus then shifted towards settlement. Iron Age activity was excavated at Kilree 4, a site which contained a probable token cremation burial within a double ringditch (171BC–AD4, UBA 15563), which was located on flat, gravely ground that overlooked the River Nore and its floodplain. At Holdenstown 1, three ringditches of Iron Age date were excavated. The largest was penannular in plan and had an undug, east-facing causeway. The two best preserved ringditches had evidence of re-cutting which may have been a symbolic act of redefining the burial monument. The primary phase has been interpreted as representing funerary feasting while the secondary phase consisted of burial possibly dating to the late Iron Age. Both ringditches were subsequently re-cut and were backfilled with material which included burnt bone, charcoal, seeds, and animal bone. The quantity of cremated bone is indicative of token cremation mixed with pyre debris. Although Ringditch 3 was heavily truncated, it also contained evidence of token cremation. The evidence thus far is indicative of burial potentially in the Iron Age and the site was later re-used as an inhumation cemetery known as a ferta, during the early medieval period. A shallow, northeast–southwest linear ditch spanned the entire width of the site at Holdenstown 1. The precise function of this ditch is unknown; however, its length and the fact that no return was identified

suggest that it may have been a boundary ditch. It is possible that it is broadly contemporary with the burials within Ringditch 2, as these burials followed the same alignment of this ditch and there was no truncation. The ditch has been dated to the Iron Age period (168–3BC; UBA 13108). It is then possible that the burials associated with Ringditch 2 and with this ditch were placed either inside or outside the boundary; both of which suggests a significant symbolism.

In Danesfort 12 a furnace had evidence of reddened sides and a burnt and blackened rim but the base was not scorched. The fills contained large quantities of charcoal and slag. It is possible that this activity was contemporary with the Iron Age funerary activity recorded on site. Metallurgical activity was also recorded at Danesfort 13 and included two smelting furnace pits, a metalled surface, three waste pits, and an occupation deposit. This activity may also have been contemporary with Iron Age funerary activity also recorded on site. At the multi-period site of Danesfort 5 a metalworking area was identified and included several pits and deposits. Of these pits one returned an Iron Age date of 786–543BC (UBA 12192). A kiln excavated at Danesfort 5 also produced Iron Age dates ranging between 169BC and AD50, (UBA 12189–91). Other features at this site were dated to the late Bronze Age period and the Iron Age activity may indicate a continuity of settlement at the site. At Holdenstown 2 a total of five kilns were identified with one dating to AD21–203 (UBA 13111). Both Danesfort 2 and Holdenstown 4 returned Iron Age dates from features associated with burnt mound activity (744–407BC UBA 11000; 765–420 BC; UBA 13114).

The Northern Landscape

The northern landscape of the N9/N10 Phase 4 also contained Iron Age evidence. The aforementioned Freestone Hill (KK020-018) is located directly to the south of this landscape and two additional hillforts can also be located in the north of the county. Clomantagh (KK008-124002) overlooks Johnstown in north-west Kilkenny and similar to Freestone Hill, the site was originally used in the Bronze Age as a funerary complex (Gibbons 1990, 18). A linear earthwork has also been recorded at Woodsgift (Gibbons 1990, 20) and is located directly to the south of this site. The other possible hillfort in the region is recorded at Tooremore or Carndubh to the east (*ibid*.). This hillfort which is not shown on the Ordnance Survey maps, is situated on Corrandhu Hill, two miles east of Ballyragget, straddling the townland boundary between Toore More and Donaghmore (Condit and Gibbons 1988, 49). Further to these, located along the Kilkenny-Carlow border is a linear earthwork known as the Rathduff Trench (KK026-006). It ran for over three miles from the River Barrow at Duninga, in a north westerly direction to the foothills of the Castlecomer plateau above Shankill (Gibbons 1990, 20). A portion of this linear earthwork was excavated at Shankill 1 and consisted of a U shaped ditch with a bank

Excavations in the northern landscape of the N9/N10 produced a small amount of domestic settlement evidence. The fill of a stakehole associated with a possible structure at Moanduff 1 produced an Iron Age date of AD215–376 (UBA 13124); the site also had evidence of occupation in the Bronze Age which implies that the site may have been used throughout both periods. Radiocarbon dating for Rathcash East 1 also indicates use of the site during the Iron Age period. The excavated features included a possible structure that may be inferred as a ringditch as a result of the middle Iron Age date retrieved from its fill (38BC–AD73; UBA 12221) and an associated rubbish pit (37BC–AD123; UBA 12220). Excavations in the northern landscape of the N9/N10 did not produce any evidence for Iron Age funerary activity. However ephemeral Iron Age activity was discovered at a number of sites in the form of metal working and burnt mound activity. At Rathcash East 3 a large keyhole-shaped furnace that dated to the Iron Age (160BC–AD0; UBA 14032), aligned

northeast–southwest was excavated along with six post-pits that may have supported a shelter around the west side of the furnace. The post – pits had a rectangular arrangement, being open on the east (furnace) side. The furnace had 18 fills, with the majority containing significant amounts of charcoal and frequent slag. Some of the post-pits contained charcoal, burnt clay and slag. One of the post-pits has been dated to 362–200BC (UBA 14033). A kiln and pit excavated at Cranavonane 3 have been dated to 104BC–AD50 (UBA 12251) and 341–54BC (UBA 12252) respectively. In addition to these features a pit excavated at Jordanstown 1 returned a date of 382–206BC (UBA 12233) and a pit at the multiperiod site of Moanduff 2 retrieved a date of AD140–385 (UBA 12260). Features associated with burnt mound activity dating to this period were excavated at Rathcash 2 where the fill of a trough dated to 344–55BC (UBA 12219) and at Kellymount 2, where a waterhole has been dated to AD236–380 (UBA 14041). The fill of a trough at Kellymount 3 also returned a date of 751–409BC (UBA 14043).

Conclusion

The presence of the Iron Age ringditches along the N9/N10 Phase 4 and the number of sites displaying industrial activity dating to this period confirm the presence of an Iron Age community in the region. The possible structure at Rathcash East 1 may also be indicative of an Iron Age settlement site, further demonstrating Iron Age activity in the locality. The presence of three hillforts in north Kilkenny suggests that it was an area of considerable importance during this period (Condit and Gibbons 1988, 52). The lack of excavated domestic settlements along the route is not indicative of a sparse population at the time rather they were not located along the corridor of the N9/N10 route-way and have yet to be discovered.

3.2.2 The General Medieval Landscape of the Scheme

The medieval period in Ireland is generally understood to have occurred between AD1100 and 1400. Direct evidence of medieval structural activity was located predominantly within the central landscape, and only peripheral settlement evidence was identified in the southern and northern landscapes. It is possible that the specific areas of Danesfort and Kilree that experienced continuity of place and function were ideally positioned. They were close to the expanding hinterland of Kilkenny town and close to the main arterial routes, in the form of the King's River and the River Nore, allowing these sites to function as viable focuses for settlement. The main settlements identified as part of the N9/N10 Phase 4, at Danesfort, Kilree 4 and Leggetsrath East 1 represented small farmsteads, with uncomplicated archaeological records, suggesting that they were relatively short-lived and supported small family or kin groups. These farmsteads were undoubtedly in the shadow of the large, more well-established settlements, such as Jerpoint and indeed Kilkenny, in the vicinity which were located in much more amenable land and closer to the larger route-ways. Despite this, the evidence of paths at three N9/N10 sites (Baysrath 2, Tinvaun 3 and Knockadrina 2) indicates that these smaller farmsteads were still an integral part of the wider community. There was a lack of medieval settlement activity in the southern and northern landscapes, suggesting that perhaps during the early medieval period, when population levels were relatively high, certain farmers were forced to inhabit the less well-drained lands and then in the later medieval period, when the population had decreased substantially, farmers had increased access to better land. In this period the issue of land ownership had changed dramatically from the preceding Iron Age and early medieval period. Division of the land by Anglo-Norman knights led to the introduction of land control by means of a feudal system. William Marshal owned much of the lands within the central landscape, most notably around Danesfort (Crouch 2002, 101). The only medieval funerary activity excavated as part of the N9/N10 was derived from Kilree 4. Most of the metalworking features along the N9/N10 Phase 4 excavations were of Iron Age or early medieval date and it

is likely that by the medieval period the processes of metalworking were controlled within Kilkenny or the ecclesiastical centres. There were, however, several kilns identified which were most likely of medieval date.

Medieval Activity in the Northern Landscape

Shankill Castle lies approximately 0.5km away from the sites excavated at Shankill and has its origins in the medieval. It is likely that this tower house was constructed by relatively wealth inhabitants, such as strong farmers and minor lords. Medieval activity excavated at Shankill 2 may be associated with this settlement. Further evidence from this period comes from a wooden cross found near St Brigid's well in Sliguff, providing evidence of ecclesiastical activity within this northern landscape. Kellymount Abbey, in the parish of Shankill, had also continued to function during the medieval period further indicating a medieval population in the area at this time. The ecclesiastical complex of St Mullins which had its origins in the early medieval also continued in use throughout the medieval and additional buildings were erected at the site during this period. Today a medieval church ruin and a number of medieval domestic buildings are still evident at the complex. There was no evidence for medieval domestic structures as a result of excavations in the northern landscape and indeed the only medieval activity recorded as part of the N9/ excavations consisted of a kiln at Shankill 2 which has been dated to the medieval period (AD1223–1274; UBA 12237). Several sherds of medieval pottery were recovered from this site, although the majority were derived from topsoil; the remainder included Leinster Cooking Ware and Kilkenny-type wares. The oval kiln was lined with one or two rows of stones; a deliberate gap (0.35m) in the stone lining marked where the flue and the bowl merged.

Conclusion

It seems apparent that by the medieval period the focus of settlement had shifted to the better land located outside this environment. Indeed, domestic settlement was becoming less dispersed than it had been in the preceding early medieval period and was instead focusing upon more centralised locations, such as at Newtown-Jerpoint and Knocktopher. The peripheral medieval evidence recovered as part of the N9/N10 Phase 4 excavations demonstrates this contraction and the areas which were inhabited and used in the prehistoric and early medieval periods were, with the exception of Knockadrina – to a limited extent – and Danesfort and Kilree, relatively abandoned in the medieval period. Knockadrina was positioned close to an old pathway between the hills, while Danesfort and Kilree were located adjacent to the King's River and the River Nore, respectively. The number of medieval kilns recovered from the N9/N10 Phase 4 was far less than those from the early medieval period and perhaps indicates a growing control over cereal production in towns and ecclesiastical centres and that the average independent farmer was not able to access such resources. The pattern of the castles and ecclesiastical centres within the landscape is also of note; these are predominantly, but not exclusively, found in the southern reaches of the N9/N10 Phase 4 and where they do not appear in the landscape is within the potential zone of influence around the monastic centres. Combined with the evidence from the surrounding towns, the excavated sites suggest that the area was a hospitable place during the medieval period, even for foreign settlers who had no need for defensive measures. It suggests a thriving market economy and relatively prosperous farmers living and trading with the Kilkenny City inhabitants. The city itself was ever-expanding and was even for a time the capital of medieval Ireland and it traded with other Anglo-Norman towns such as Wexford, New Ross and Waterford in the south-eastern region.

3.2.3 The Site Specific Archaeological Landscape of Shankill 5

There are no previously recorded monuments dating to the prehistoric period in the vicinity of Shankill 5. The site of a *fulacht fiadh* (CW015-014) is recorded *c*. 780m to the north and the site of a ringfort (CW015-006) is recorded *c*. 1.4km to the north-east. Ringforts (KK016-005 and 007) are also recorded *c*. 1.1km to the south-east and *c*. 1.4km to the south. A *fulacht fiadh* site (KK016-003) is also recorded *c*. 850m to the south-west and a settlement hearth site (KK016-002) is recorded *c*. 600m to the south-west of Shankill 5.

At Shankill 5 the remnants of a structure, comprising two parallel slot-trenches was excavated. The slot-trenches may have served as an entrance porch to a larger structure, no longer extant, or may have been part of a small platform unrelated to a habitation dwelling. A nearby group of four shallow postholes may have formed a similar structure. A large stone-filled pit and three other shallow pits, one of which has been dated to the early Iron Age period, four stakeholes and a pit filled with hearth waste which has been dated to the medieval period were the only other features of note on the site. It is likely that this site had a number of occupation phases as a stone axe was recovered during the cleaning back of the site ahead of its excavation and one sherd of Beaker pottery was recovered from topsoil. A number of sites were excavated to the NNE of Shankill 5, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. Shankill 6 was located *c*. 80m to the NNE and four undated small spreads/deposits were excavated at this site. They were the remnants of burnt mound material but no features associated with this type of monument were found and the material appeared to have washed into the area and had silted up in naturally formed depressions. Moanmore 1 was located *c*. 300m to the NNE and a burnt mound complex consisting of three troughs, an area of burning, a pit, and a series of stakeholes dating to the late Bronze Age was excavated. Further to the NNE, at Moanmore 2, located *c*. 1.15km from Shankill 5, two circular structures and associated features dating to the middle Bronze Age period were excavated.

A number of sites were also excavated to the SSW of Shankill 5, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. Shankill 4 was located *c*. 200m away and an oval prehistoric hut structure made up of postholes and stakeholes and a few shallow outlying pits was excavated. An arc of stakeholes on its north side might have formed a separate sheltered space. The structure was partially covered by an occupation deposit. One of the outlying pits contained heat-shattered stones and the site therefore may have been a campsite linked to burnt mound activity. Sherds of middle Bronze Age pottery were recovered from the site and the site has been dated to the early Bronze Age period. It is possible that this site is associated with the activity at Shankill 5. Shankill 3 was located *c*. 500m away and an undated shallow pit/hearth containing three fills was excavated at this site. Shankill 2 was located *c*. 1.15km to the SSW and a medieval cereal drying kiln was excavated at this site.

3.3 Typological Backgrounds

3.3.1 Typological Background of Temporary Prehistoric Structures

The rise in development-led 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, Bronze Age and Iron Age periods as with Shankill 5. 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.

3.3.2 Typological Background of Isolated pits

It can be difficult to get in to the prehistoric 'mind set' when interpreting archaeological remains, none more so than in the case of apparently isolated pits and postholes, sometimes containing 'ritually' deposited items.

Usually large postholes/pits are interpreted as load bearing or structural elements of a building however when these features are identified in relatively isolated contexts away from obvious structures that explanation is not plausible. What then was their function? Were they excavated purely as rubbish pits to deposit pottery or finds or did they have more significance? Were they a 'closing deposit' when a structure was being abandoned/dismantled? Even if the deposition was attributable to such actions what was the posthole/pit excavated for, what did it support? Totem poles or marker posts have been suggested for such anomalies in the past indeed it has been noted that all a totem pole would leave behind in the archaeological record is a seemingly unremarkable large posthole (Barker1993, 25).

It is possible that some isolated pits/postholes represent simple refuse pits associated with temporary settlement but may also have been excavated and backfilled as part of a ritual associated with the transient nature of people at the time. Edmonds suggests that pits were dug and filled as people left a place for a season, like the planting of crops, offering "the hope of renewal and return" (Edmonds 1999). Pollard also suggests that abandoning a settlement and moving on was an act of social transition, and a potential threat to social order. The digging and filling of pits may have been a way to counter this threat (Pollard 2001).

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

3.4 Summary of the Excavation Results

The excavation at Shankill 5 has identified a possible small temporary structure based around two short linear alignments of postholes that had the appearance of being set into slot-trenches. It is possible that there was no definitive slot but that the setting of the posts immediately adjacent to one another created a linear void. The postholes would have held round vertical posts with a larger post placed at the west end of each alignment. The slot-trench alignments were 1.70m long and orientated east-west. The slot-trenches/post alignments were 1.10m apart, and there was no evidence that they were truncated by later activity at either end. To the west of the slot-trenches there were four possible postholes in a sub-rectangular or trapezoidal

plan, that may have been related to the main structure. Three small stakeholes to the south and a further one to the east of the structure may or may not be related. Immediately southwest of the slot trenches there was an oval pit which contained a piece of flint debitage, charcoal, hazelnut shell fragments, burnt bone fragments and heat shattered stone. The varied material within the fill could suggest it was a waste pit associated with domestic settlement. It was dated to the early Iron Age. It is thought likely that the slot trenches, pit and other features in the immediate vicinity are likely to all be contemporary. A number of other pits on the periphery of the structure may be further waste pits although the largest pit on the site contained unburnt stones and may be a soak pit or associated with land clearance. In the north of the site a charcoal rich pit was dated to the medieval period. It is also interpreted as being a waste pit, possibly from a hearth, as there was no evidence of in situ burning. It was dated to the medieval period and clearly represents a separate phase of activity to the Iron Age structure.

Artefacts from the site consisted of predominantly of lithics which may be residual from earlier prehistoric activity in the wider area, although no definitive evidence of early prehistoric activity was identified from the site. Of particular interest were a worn sherd of Beaker pottery and an early Neolithic polished stone axe that were found within the topsoil or clearance layers. As these are not from secure contexts they must be regarded as stray finds and cannot be directly linked to any phase of activity on the 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 excavation yielded a single worn necksherd (weight: 2g) representing a final Neolithic/ early Bronze Age Beaker. The Shankill 5 material is an important addition to the previously poorly represented distribution of later prehistoric activity on this section of the Nore Valley.

Lithics analysis

The lithic finds from the archaeological excavation at Shankill 5 are a flint flake, a chert flake, two pieces of flint debitage and a polished stone axe. The assemblage dates to the early Neolithic period based on its morphological and technological characteristics. The discarded flakes and debitage represent waste from lithic production and the immediate use of lithic tools at the site.

Charcoal and Wood Species identification

Charcoal was identified from five contexts at Shankill 5. Alder, birch, hazel, ash, cherry, oak and elm was identified. The results are dominated by oak. Two posts may have been made from oak. The charcoal indicates that the people at Shankill were gathering fuel and building materials from a variety of woodlands.

Analysis of Plant Remains

A total of seven samples contained plant remains: C36, C12, C66, C62, C36, C34 and C64. The plant remains included fragments of hazelnut shells and small amounts of barley and wheat grains. Both wheat and barley are known from the earliest Irish prehistoric sites and are relatively common finds in prehistoric settlement deposits. However, the cereal remains from this site were recovered in such small quantities that it is not possible to determine the relative importance of the various different

types found in these deposits. Hazelnut shell fragments are much more common in the deposits from this site, being found in five of the seven samples examined. The hazelnut shell fragments from this site are of limited interpretative significance.

Animal Bone Analysis

A total of 72 burnt bone fragments were recovered from C12, C14, C34, C36 and C42 on Shankill 5. Due to size and poor preservation it was not possible to identify any of the 72 burnt bone fragments to species. A series of 24 fragments were classified as small size mammal, whilst a total of 8 calcined fragments were categorised to medium sized mammal.

Petrographical analysis

Two samples of heat-affected stone, from C40/C57 and C34 were submitted for analysis. Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

Radiocarbon Dating

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

The results of the analysis dated hazel charcoal from the fill C62 of a hearth. The 2 sigma calibrated date was AD1399–1436 (UBA 12239).

The results of the analysis dated hazel charcoal from the fill C34 of a pit. The 2 sigma calibrated date was 791–547BC (UBA 15417).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation at Shankill 5 has identified a possible temporary structure as well as pits that may be associated with dumping of domestic waste or could be tentatively related to burnt mound activity. The site has been dated to the early Iron Age, with one further feature dated to the medieval period. The surrounding physical landscape of the site had no distinguishing features. The site was in generally flat pasture, but was located on a slight northeast facing slope. The nearest obvious water source was a stream over 200m to the north. The identification of an archaeological site within this landscape is not unexpected particularly given the ephemeral nature of the remains. The identification of features possibly associated with burnt mound activity would not have been anticipated given that burnt mounds are generally located in wetter, marginal landscapes.

The surrounding archaeological landscape shows a number of recorded prehistoric monuments with 1km, although none in the immediate vicinity. Of note are the two *fulachta fiadh* (CW015-014 and KK016-003) and a settlement hearth site (KK016-002) which represents burnt mound activity and possible transient, temporal settlement as this is the nature of the activities recorded at Shankill 5. A number of sites excavated to north and south of Shankill 5 as part of the N9/N10 Phase 4 show further evidence of temporary settlement and burnt mound activity, although the nearest sites, Shankill 3 (690m to the south) and Shankill 4 (150m to the south) and Shankill 6 (80m to the north) did not produce any evidence of contemporary activity. The nature of the activity at Shankill 5 would be expected in the context of the surrounding archaeology, and it is clear that the area was not intensively settled in prehistory and was the focus of transient and ephemeral sites.

The slot trench structure, and associated peripheral postholes and stakeholes may have been a temporary dwelling (Figure 5). The posthole alignments/slot trenches appeared to have supported round posts which had been driven into the ground with little preparatory groundwork, as the posthole sides were vertical and there was no obvious packing. It is unclear what the precise nature of the structure was and whether the posts represented walling or provided structural support for light roof.

The nature of the structure appeared to represent a small temporary construction rather than a house with defined elements. However, many of the elements identified at the site would be consistent with features to could be expected on the site of domestic settlement. These would include additional postholes/stakeholes, storage pits, and waste pits, all of which were identified at Shankill 5. The presence of formal postholes in the slot-trench alignments could clearly have been so the Shankill 5 structure could have been roofed, but its small size and area may indicate that it was a platform rather than a building. The identification of possible waste pits containing flint flakes, burnt bone, charcoal, hazelnuts and deposits of heat shattered stone point to domestic waste and confirm that site may have functioned as a domestic settlement site, albeit a temporary one.

The isolated medieval pit in the north of the site could indicate the presence of further medieval remains beyond the limits of the site. It should also be considered that the date of this pit represents disturbed material and that the pit is broadly related to the remainder of activity on the site. As it is a single isolated feature it is impossible to interpret its significance accurately.

Small shallow round-bottomed pits filled with heat-shattered stone, generally referred to as pot boiler pits or roasting pits, are often associated with burnt mound sites. The

pit features with associated heat shattered stone at Shankill 5 may represent a series of pot-boilers or roasting pits although it would be anticipated that some scorching of the base and sides of the pits would have been identified. The lack of scorching suggest that the pits either functioned as troughs or as waste pits into which the burnt material was dumped once cooled, obviously from an activity located outside the limits of the excavated site. While no definitive burnt mound spread was identified at the site, it is possible that it lay outside the limits of the site. However, it is also not unusual for no mound deposit to be recorded on these types of sites and the only evidence for hot-stone technology is within the fills of pits and troughs. However, it is interpreted that given the nature and form of the burnt stone deposits at Shankill 5 that they may be more likely associated with domestic waste rather than with burnt mound activity, although burnt mound activity is recorded in the wider environment.

Artefacts recovered from the site included lithics, in particular a polished stone axe, and a very worn sherd of Beaker pottery. The small lithics consisted of flakes and debitage and while they may indicate related activity beyond the limits of the site, they do not appear in sufficient quantities to be regarded as significant to the archaeology of the site. The Beaker pottery and the polished stone axe represent far more significant findings, however as they do not come from secure contexts but from topsoil or clearance material, their significance in terms of the excavated features is rendered somewhat meaningless. No comparable dates or artefacts were recorded within the excavated features. The presence of these two artefacts does suggest the presence of early Neolithic and Beaker activity in the immediate vicinity of the site, and are important in terms of the wider study and distribution of these finds.

4.2 Conclusions

The archaeology at Shankill 5 represents a temporary settlement that may be related to small scale burnt mound activity that has been dated to the early Iron Age. Evidence from the archaeological landscape confirms that this area was not intensely settled in prehistory and was associated with small temporary settlement and burnt mound sites. The nature and date of the findings at Shankill are important locally as it confirms the nature of the landscape in the early Iron Age.

The isolated medieval pit in the north of the site could indicate the presence of further medieval remains beyond the limits of the site however this is tentative.

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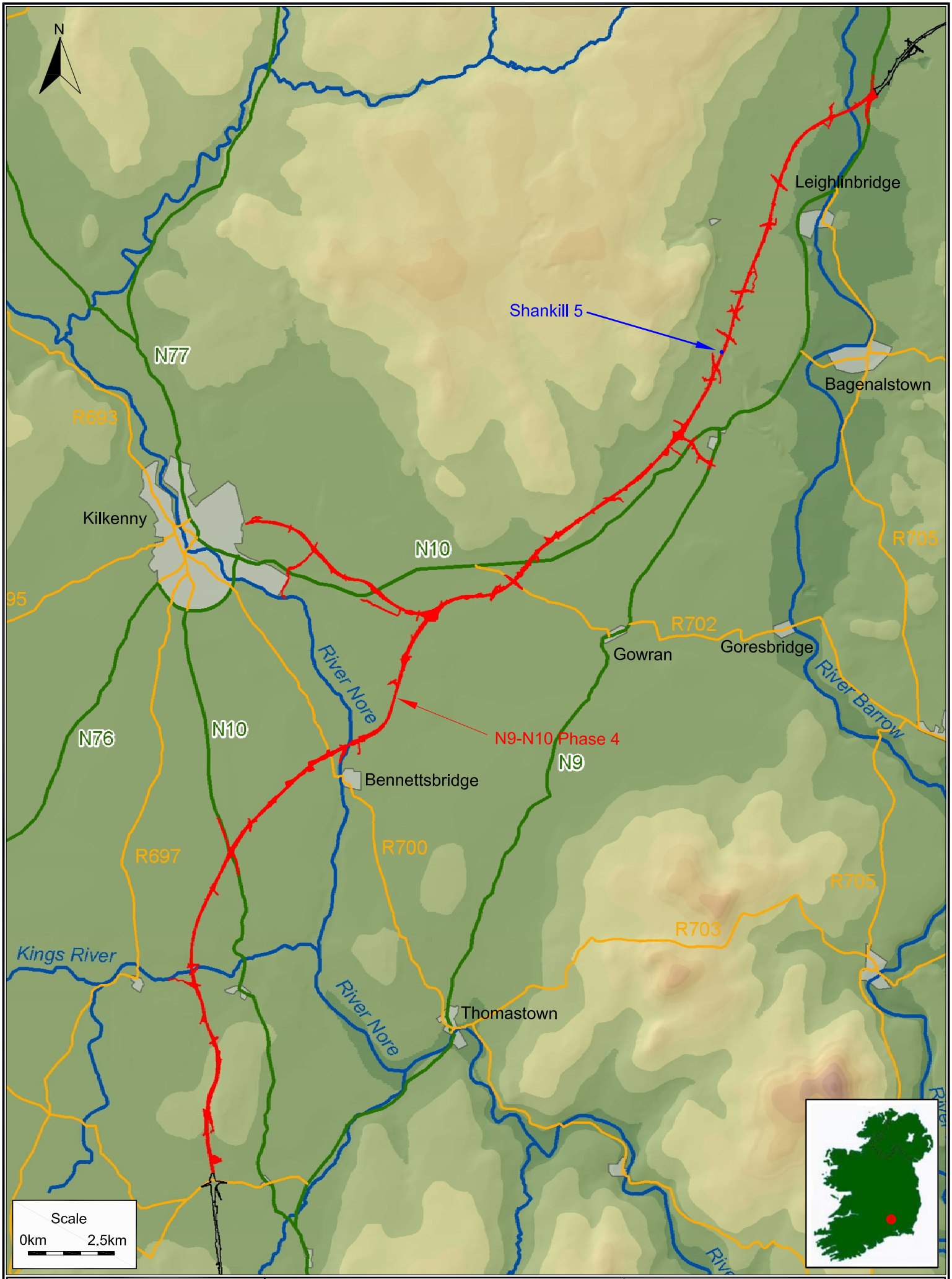

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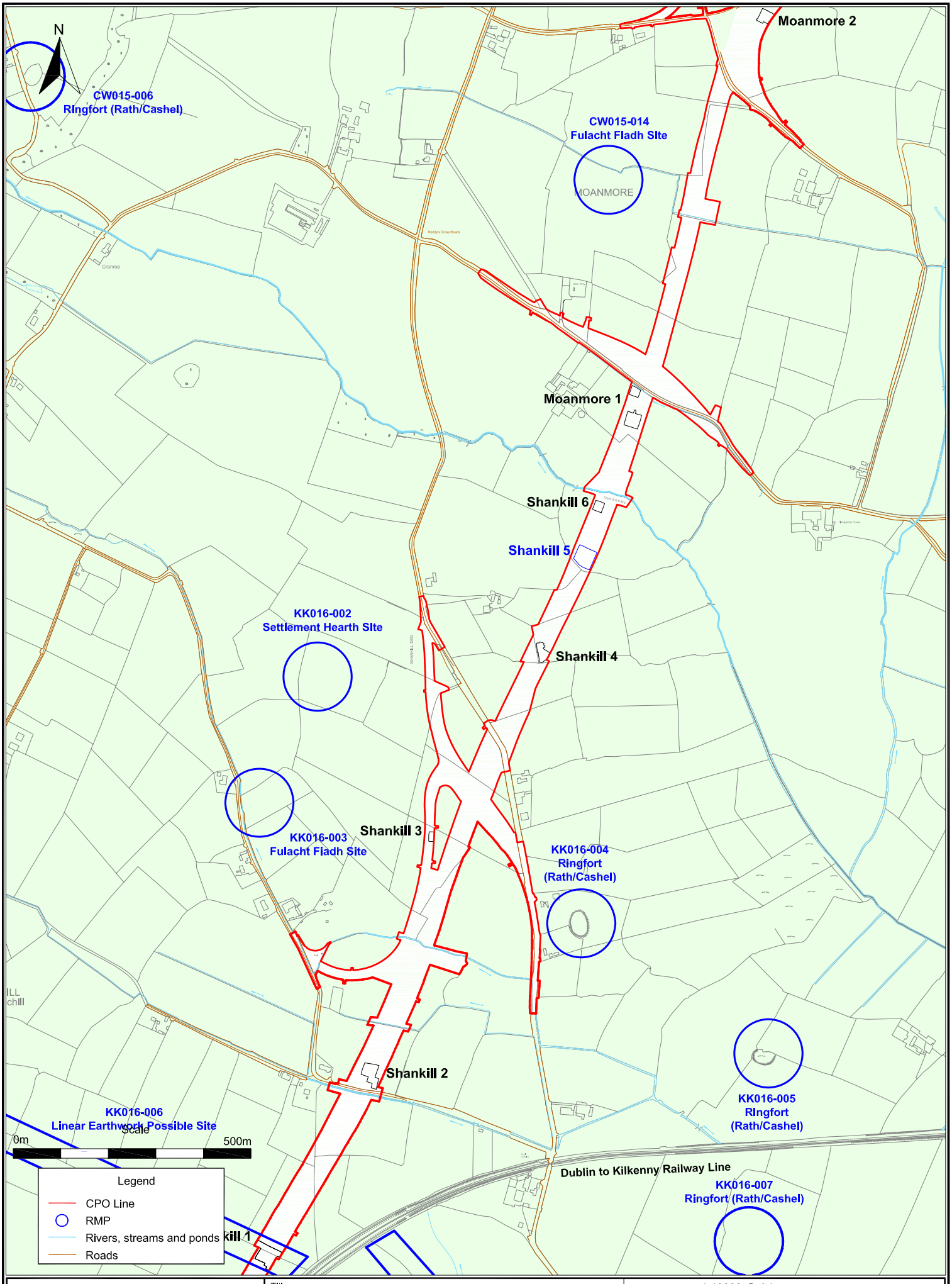

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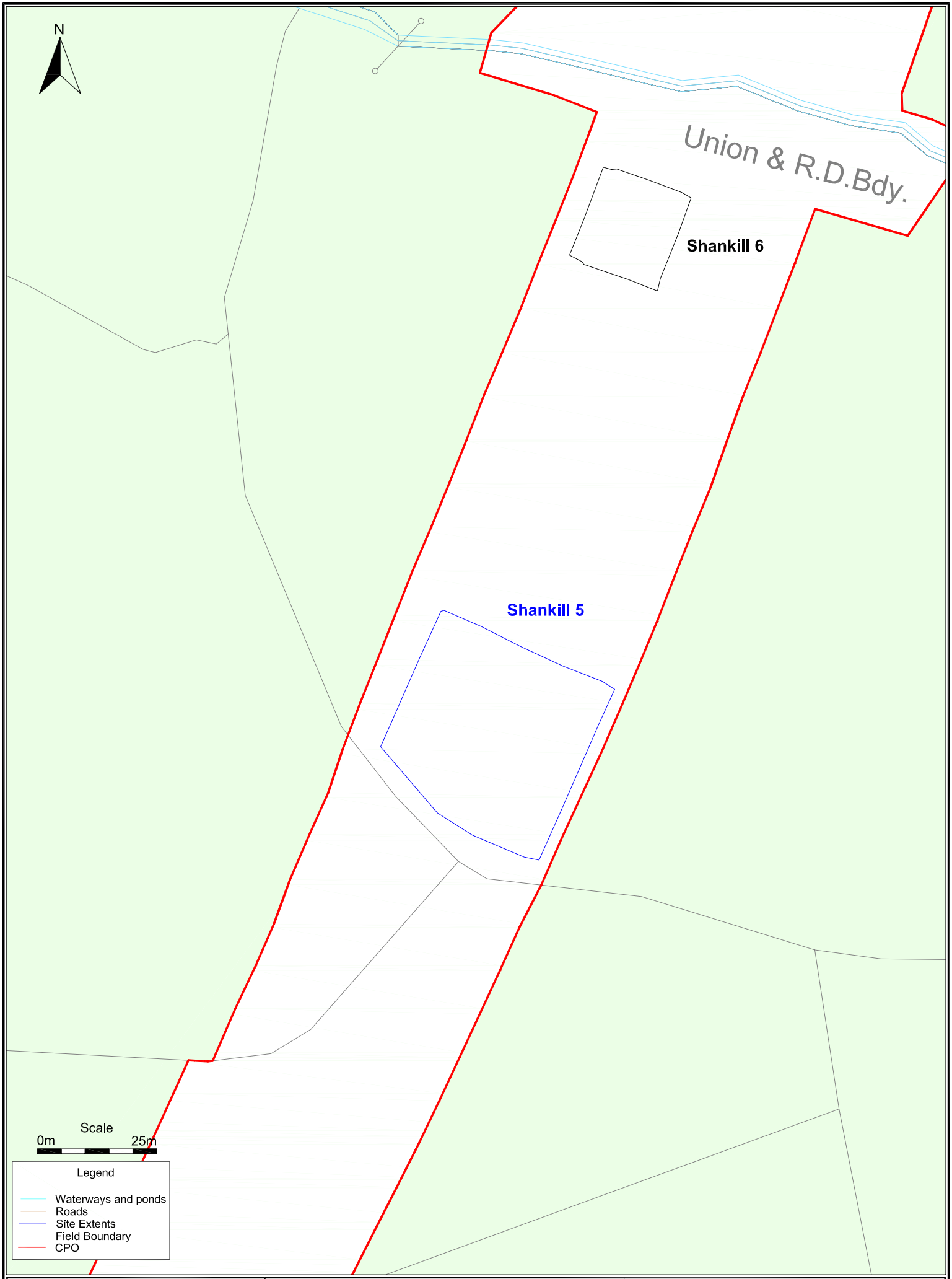

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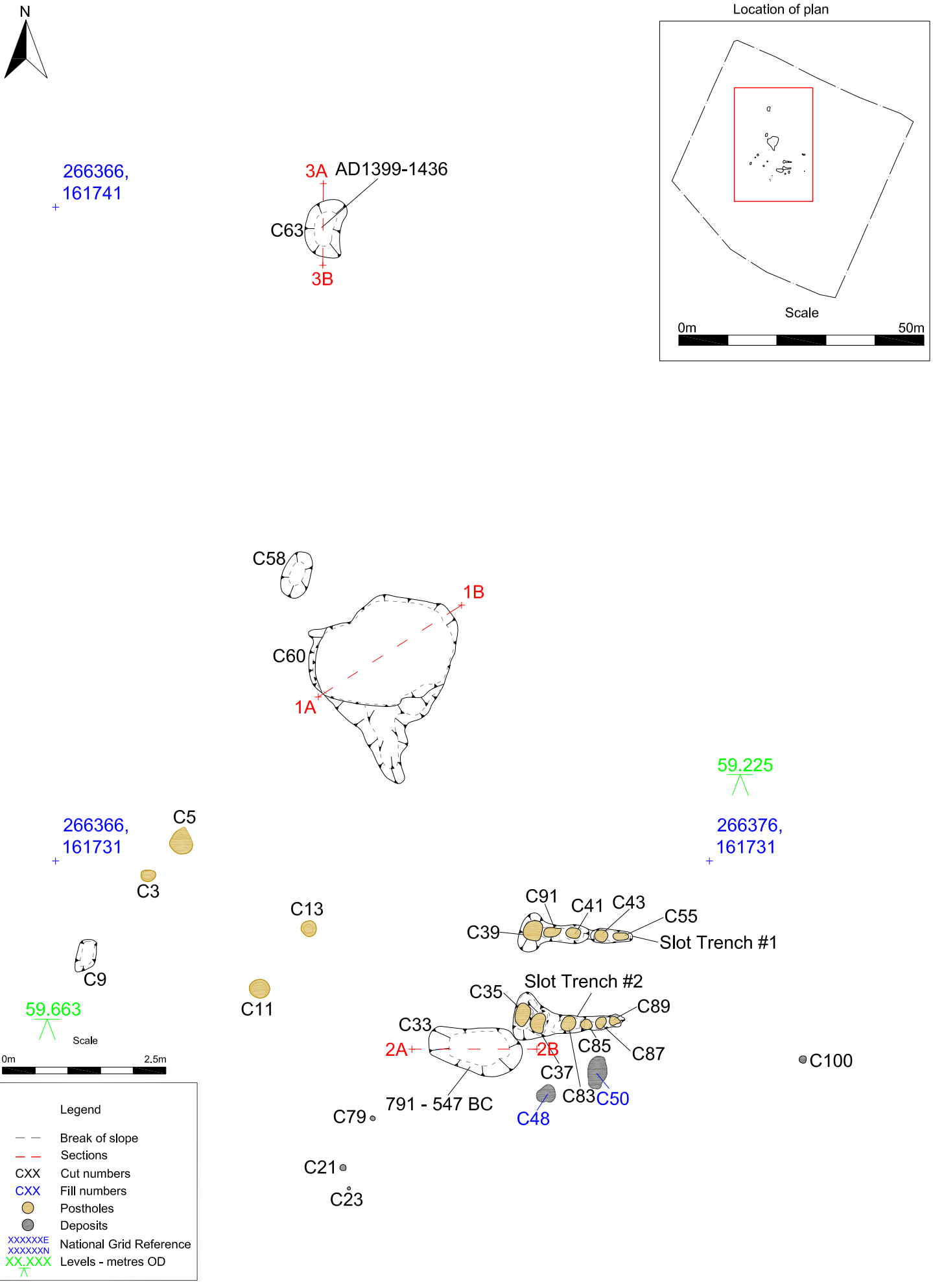

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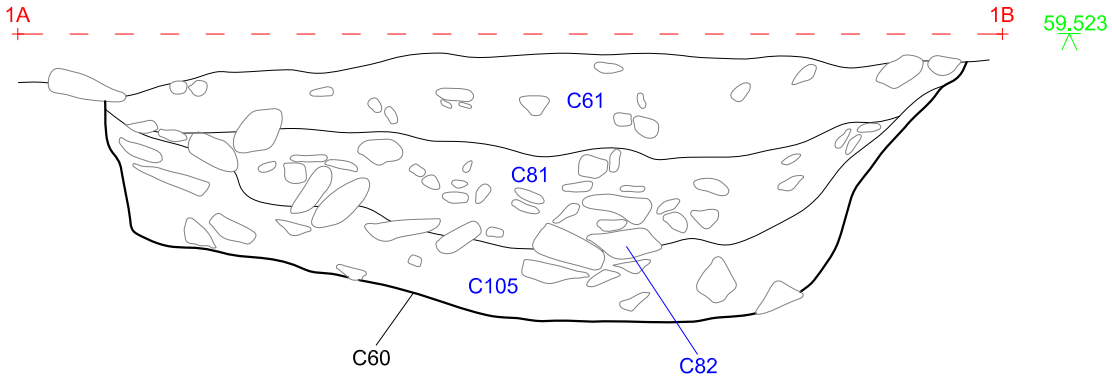
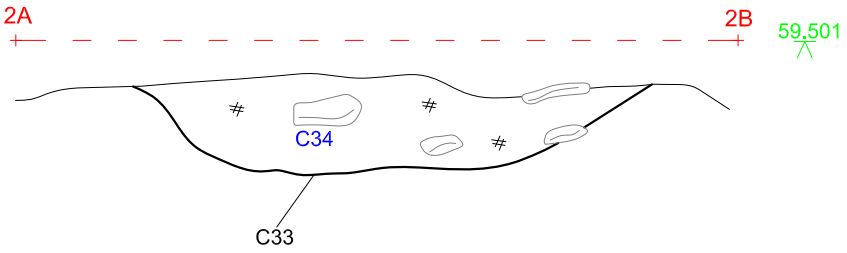
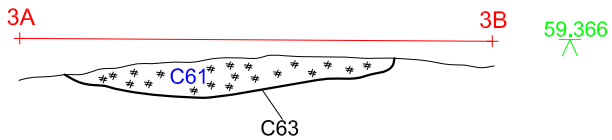
Shankill 5
Southeast- facing section of C60
Dwg 1



North facing section of C33



West facing section of C63



Scale
0m 1m

Legend

CXX	Cut Numbers
CXX	Fill Numbers
	Stone
#	Charcoal
XX.XXX	Levels - metres OD

IAC Irish Archaeological Consultancy

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

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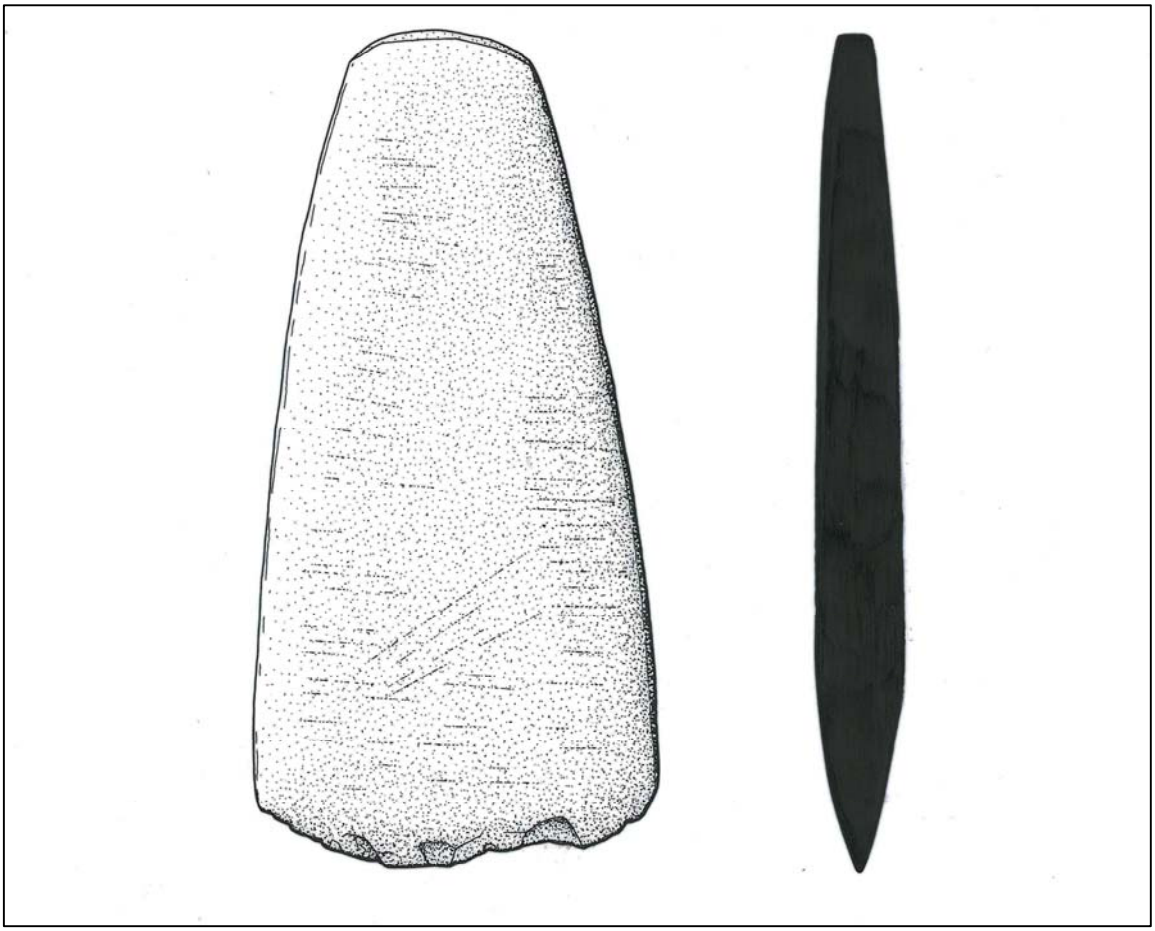

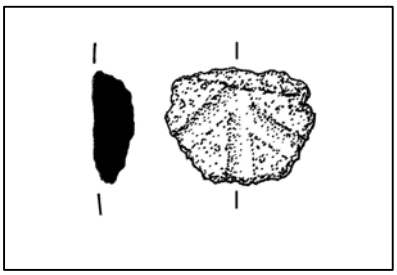

Scale

0mm 50mm

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	Project: N9/N10 Phase 4b	Produced by:	P Higgins
		Job No:	J2432.1
	Client: Kilkenny County Council	Figure No:	6

PLATES

Plate 1: Shankill 5, pre-excavation, facing west

Plate 2: Shankill 5, post-excavation, facing north-east
(The tree-lined hedgerow is the Kilkenny–Carlow border)

Plate 3: Slot-trench 1 (right) and Slot-trench 2 (left), post-excavation, facing west

Plate 4: Large pit C60 showing stone deposit, mid-excavation, facing south

Plate 5: Large pit C60 showing stone deposit, mid-excavation, facing east

Plate 6: Large pit C60, post-excavation, facing east

Plate 7: Postholes C11 and C13 with C3 and C5 in the background, pre excavation facing northwest

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				Topsoil	Soft light greyish brown sandy silt with common medium-sized angular and sub-rounded stones		
C2	N/A				Natural	Orange-yellow sandy clay with dispersed gravel-sand concentrations		
C3	N/A	0.24	0.17	0.04	Cut of posthole	Oval, northeast–southwest, not perceptible break of slope at top, gradual break of slope at base, not perceptible sides and flat base	C4	C2
C4	C3	0.24	0.17	0.04	Fill of posthole	Softly compacted, mid-greyish brown silty clay with occasional charcoal and frequent small pebbles	C1	C3
C5	N/A	0.44	0.42	0.07	Cut of posthole	Circular, break of slope at top, gradual but southeast part imperceptible, western side was concave, eastern was straight; break of slope at- base gradual to imperceptible; flat base	C6	C2
C6	C5	0.44	0.42	0.07	Fill of posthole	Softly compacted, greyish light brown silty clay with occasional charcoal flecks, few medium-sized sub-angular stones on top	C1	C5
C7–C8						UNUSED		
C9	N/A	0.66	0.33	0.08	Cut of pit	Oval, north–south, break of slope at top was gradual on north and east and imperceptible on south and west. Sides concave to straight; break of slope gradual at base, which was flat	C10	C2
C10	C9	0.66	0.33	0.08	Fill of pit	Softly compacted, mid-greyish brown silty clay with frequent medium-sized angular stones, occasional charcoal flecks. Roots in southern part	C1	C9
C11	N/A	0.33	0.3	0.13	Cut of posthole	Circular, sharp break of slope at top, gradual break of slope at base, vertical sides and stones at the base	C12	C2
C12	C11	0.33	0.3	0.13	Fill of posthole	Loosely compacted, dark grey silty clay with moderate charcoal and small stones	C1	C11
C13	N/A	0.21	0.21	0.1	Cut of posthole	Circular, sharp break of slope at top; quite steep sides; gradual break of slope at base and flat base	C14	C2
C14	C13	0.21	0.21	0.1	Fill of posthole	Softly compacted, greyish/blackish mid-brown silty clay with frequent charcoal flecks, occasional burnt flecks of bones and few angular medium-sized stones	C1	C13
C15–C20						UNUSED		
C21	N/A	0.1	0.1	0.18	Cut of stakehole	Circular, vertical sides	C1	C23
C22	C21	0.1	0.1	0.18	Fill of stakehole	Softly compacted, light grey silty clay with occasional charcoal		
C23	N/A	0.06	0.06	0.05	Cut of stakehole	Circular, vertical sides		
C24	C23	0.06	0.06	0.05	Fill of stakehole	Softly compacted, light grey silty clay with occasional charcoal	C28	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C25–C26						UNUSED		
C27	N/A	0.86	0.96	0.3	Natural depression	Circular, imperceptible break of slope at top and base, moderately sloping sides and concave base	C1	C2
C28	C27	0.86	0.95	0.25	Deposit	Irregular, firmly compacted, reddish brown clay with occasional charcoal	C1	C2
C29	C27	0.43	0.45	0.12	Cut of stakehole	Circular, sharp break of slope at top, gradual break of slope at base, vertical sides and flat base	C22	C2
C30	N/A	0.9	0.9	0.19	Fill of stakehole	Softly compacted, greyish brown silty clay with occasional charcoal	C1	C21
C31	N/A	0.92	0.3		Cut of stakehole	Circular, gradual break of slope at top and base, vertical sides, concave base	C24	C2
C32	N/A	0.39	0.37	0.12	Deposit	Circular, loosely compacted, yellowish red burnt clay and silty clay with small stones and charcoal flecks	C1	C2
C33	N/A	1.3	0.75	0.14	Cut of pit	Oval, east–west break of slope at top, gradual on east–west side gently sloping; sloping sides; gradual break of slope at base, flat base	C34	C2
C34	C33	1.3	0.68	0.14	Fill of pit	Softly compacted, dark greyish brown clayey silt with frequent charcoal, occasional pebbles, moderate cobbles	C1	C33
C35	N/A	0.59	0.68	0.25	Cut of posthole	Irregular oval, north–south, sharp break of slope at top, concave break of slope at base; sides were vertical in southwest but sloping in west; flat to uneven shape of base	C106	C2
C36	C35	0.59	0.68	0.16	Fill of posthole	Softly compacted, mid-brownish grey with yellow inclusions clayey silt with occasional charcoal flecks and stones	C1	C106
C37	N/A	0.25	0.3	0.1	Cut of slot-trench	Linear, west–east, sharp break of slope at top, not perceptible break of slope at base, moderate sloping sides and concave base	C38	C2
C38	C37	0.25	0.3	0.09	Fill of slot-trench	Softly compacted, mid-brownish grey clayey silt with occasional angular, well sorted stones	C1	C37
C39	N/A	0.55	0.36	0.2	Cut of posthole	Oval in shape, north–south, gradual break of slope at top and base; moderately sloping sides, flat base	C57	C2
C40	C39	0.55	0.36	0.1	Fill of posthole	Softly compacted, mid-brownish grey clayey silt with occasional charcoal, moderately sized cobbles (rounded, angular)	C1	C57
C41	N/A	0.28	0.26	0.2	Cut of posthole	Rounded in shape, sharp break of slope at top, vertical sides, gradual break of slope at base and pointed base	C42	C2
C42	C41	0.28	0.23	0.2	Fill of posthole	Softly compacted, dark brownish grey clayey silt with occasional pebbles, cobbles and frequent charcoal (pieces and flecks)	C1	C41
C43	N/A	0.4	0.2	0.13	Cut of posthole	Linear, east–west, sharp break of slope at top, gradual break of slope at base, vertical sides and a tapered rounded point base	C44	C2
C44	C43	0.4	0.2	0.13	Fill of posthole	Softly compacted, mid/dark brownish grey clayey silt with moderate charcoal and cobbles, pebbles	C1	C43

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C45–C46						UNUSED		
C47						UNUSED		
C48	N/A	0.3	0.3	0.02	Spread	Patch of yellowish brown clayey silt		
C49						UNUSED		
C50	N/A	0.5	0.3	0.02	Spread	Patch of yellowish brown clayey silt		
C51	N/A	0.57	0.3	0.11	Natural depression	Linear in shape, N-E, rounded corners, sharp break of slope at top and base, concave sides, irregular base	C52	C2
C52	C51	0.57	0.3	0.11	Natural sedimentation	Softly compacted, light yellowish brown sandy silt with frequent stones	C1	C51
C53–C54						UNUSED		
C55	N/A	0.18	0.16	0.18	Cut of posthole	Rounded in shape, sharp break of slope at top, vertical sides, gradual break of slope at base and tapered rounded point base	C56	C2
C56	C55	0.18	0.16	0.18	Fill of posthole	Softly compacted, light brownish grey clayey silt with moderate charcoal, occasional cobbles and pebbles	C1	C55
C57	C39	0.28	0.26	0.1	Fill of posthole	Softly compacted, mid-greyish brown clayey silt with occasional charcoal pieces, cobbles and pebbles	C57	C2
C58	C59	0.76	0.45	0.18	Fill of pit	Softly compacted, greyish brown clayey silt with occasional charcoal and stones	C1	C59
C59	N/A	0.76	0.45	0.18	Cut of pit	Oval, north–south, gradual break of slope at top and base, concave sides and base	C58	C2
C60	N/A	2.2	1.8	0.7	Cut of pit	Irregular in shape, gradual break of slope at top and base; sides: south moderately sloped, NWE steeply sloped; base tapered rounded point	C82	C2
C61	C60	2.2	1.8	0.26	Fill of pit	Firmly compacted, light yellowish brown clayey silt with frequent to abundant charcoal flecks and frequent angular stones	C1	C81
C62	C63	0.75	0.6	0.06	Fill of pit/ hearth	Loosely to moderate compacted, dark greyish reddish black, mottled with red clayey silt with frequent charcoal flecks and moderate charcoal chunks	C1	C63
C63	N/A	0.75	0.6	0.06	Cut of pit/hearth	Oval, north–south, gradual break of slope at top and gradual to imperceptible break of slope at base; concave sides and base	C62	C2
C64	C65	0.5	0.37	0.04	Natural sedimentation	Firmly compacted, mid-brownish grey clayey silt with occasional pebbles	C1	C65
C65	N/A	0.5	0.37	0.04	Natural depression	Oval, gradual break of slope at top and base, moderately sloping sides and flat base	C64	C2
C66	C67	0.44	0.43	0.23	Natural sedimentation	Loosely compacted, mid-greyish brown silty clay with occasional pebbles and cobbles and frequent stones	C1	C67
C67	N/A	0.44	0.43	0.23	Natural depression	Oval, gradual break of slope at top and base, steep sides and flat base	C66	C2
C68–C71						UNUSED		
C72	N/A	0.69	0.59	0.14	Natural depression	Circular, gradual break of slope at top and base, concave sides and concave base	C73	C2
C73	C72	0.69	0.59	0.14	Natural sedimentation	Loosely compacted, mid-brown silty clay with small to medium-sized stones	C1	C72

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C74–C77						UNUSED		
C78	C104	3.5	1.86	0.43	Fill of pit	Loosely compacted, dark brown silty clay with occasional charcoal flecks and stones	C1	C104
C79	N/A	0.07	0.07	0.11	Cut of stakehole	Circular, sharp break of slope at top, gradual break of slope at base, vertical sides and concave base	C80	C2
C80	C79	0.07	0.07	0.11	Fill of stakehole	Softly compacted, dark greyish black silty clay with frequent charcoal flecks	C1	C79
C81	C60	1.96	1.7	0.2	Fill of pit	Softly compacted, light yellowish grey silty clay with frequent stones and occasional charcoal	C61	C82
C82	N/A	1.95	1.6	0.47	Deposit	Irregular in shape, large, tabular and sub-rounded stones (with light yellowish grey clayey silt)	C81	C105
C83	N/A	0.26	0.26	0.12	Cut of posthole	Rounded, sharp break of slope at top, not perceptible break of slope at base, moderate sloping sides and concave base	C84	C2
C84	C83	0.25	0.26	0.11	Fill of posthole	Softly compacted, mid-brownish grey clayey silt with occasional well sorted, tabular and rounded stones	C1	C83
C85	N/A	0.18	0.22	0.13	Cut of posthole	Rounded, sharp break of slope at top, not perceptible break of slope at base, vertical to moderate sloping sides and concave base	C86	C2
C86	C85	0.18	0.22	0.11	Fill of posthole	Softly compacted, mid-brownish grey clayey silt with occasional angular, well sorted stones	C1	C85
C87	N/A	0.18	0.19	0.11	Cut of posthole	Rounded, sharp break of slope at top, not perceptible break of slope at base, moderate sloping sides and concave base	C88	C2
C88	C87	0.18	0.19	0.1	Fill of posthole	Softly compacted, mid-brownish grey clayey silt with occasional stones- moderately sorted, angular and tabular	C1	C87
C89	N/A	0.19	0.19	0.1	Cut of posthole	Rounded, sharp break of slope at top, not perceptible break of slope at base, moderate sloping sides and concave base	C90	C2
C90	C89	0.18	0.2	0.09	Fill of posthole	Softly compacted, mid-brownish grey clayey silt with charcoal flecks and occasional angular, well sorted stones	C1	C89
C91	N/A	0.28	0.26	0.19	Cut of posthole	Oval, east–west, sharp break of slope at top, gradual break of slope at base, vertical sides	C92	C2
C92	C91	0.28	0.27	0.19	Fill of posthole	Softly compacted, mid-brownish grey clayey silt, moderate charcoal, occasional cobbles and moderate pebbles, flat and rounded	C1	C91
C93	N/A	1.3	0.75	0.13	Cut of pit	Oval, gradual break of slope at top and base, concave sides and flat base	C94	C2
C94	C93	1.3	0.75	0.13	Fill of pit	Softly compacted, light greyish brown silty sand with stones, occasional charcoal and moderate cobbles	C1	C93
C95–C99						UNUSED		
C100	N/A	0.1	0.09	0.08	Cut of posthole	Circular, sharp break of slope at top, gradual break of slope at base, concave sides	C101	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						and U-shaped base		
C101	C100	0.1	0.09	0.08	Fill of posthole	Softly compacted, dark brownish black clayey silt with frequent stones and charcoal	C1	C100
C102	N/A	2.8	1.8	0.25	Natural depression	Irregular, gradual break of slope at top and base, concave sides, irregular shape of base	C103	C2
C103	N/A	2.8	1.8	0.25	Fill of natural depression	Softly compacted, light yellowish brown silty sand with moderate stones and cobbles	C1	C102
C104	N/A	3.5	1.86	0.43	Cut of pit	Oval, east–west, gradual break of slope at top and base, moderately sloping sides, flat base	C78	C2
C105	C60	1.7	1.4	0.18	Fill of pit	Softly compacted, dark grey clayey silt with occasional stones, moderate pebbles and frequent cobbles	C82	C60
C106	C35	0.35	0.4	0.25	Fill of posthole	Softly compacted, dark grey clayey silt with occasional charcoal flecks	C36	C35

Appendix 1.2 Catalogue of Artefacts

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3850:001:1	1	1	Axe	Chert polished stone axe	Chert	A slightly weathered chert polished stone axe	N/A
E3850:001:2	1	2	Beaker	Sherd of beaker pottery	Ceramic	Much worn necksherd of beaker pottery. Decoration: a broad (2.2mm), shallow horizontal line with, beneath, two opposed oblique lines forming the apex of a triangle	N/A
E3850:010:1	10	1	Flake	Flint flake	Flint	A heavily patinated flint flake	N/A
E3850:034:1	34	1	Debitage	Flint debitage	Flint	Flint debitage	N/A
E3850:048:1	48	1	Debitage	Flint debitage	Flint	Flint debitage	N/A
E3850:050:1	50	1	Flake	Chert flake	Chert	A slightly weathered chert flake	N/A
E3850:050:2	50	2	Chunk	Natural chunk of chert	Chert	A natural chunk of chert	N/A
E3850:059:1	59	1	Pipe	Clay pipe stem	Ceramic	A slightly tapering fragment of clay pipe stem, cream in colour. Circular in section with a central internal hole. One end of the stem splays out where it would have joined the 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 44 soil samples were taken from features at Shankill 5 and were processed by flotation and sieving through a 250µm mesh. Only 34 produced ecofacts. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	seeds	burnt animal bone	animal bone	human bone	Heat-affected stone	Other
C10	10	Pit	0.1g						
C12	3	Posthole	0.5g	<0.1g	0.4g				
C14	4	Posthole	5.3g		0.4g				
C34	22	Large pit	13.9g	0.2g	4.3g			0.4l	
C36	32	Posthole	1.4g	<0.1g	0.1g				
C36	33	Posthole	0.5g	0.2g	36.0g				
C36	42	Posthole	0.1g						
C38	23	Posthole	0.3g						
C38	34	Posthole	0.1g						
C40	8	Posthole	4.1g						
C40, C57	9	Posthole	1.9g					0.02l	
C42	6	Posthole	11.4g		0.6g				
C44	7	Posthole	0.5g						
C52	25	Natural sedimentation	0.4g						
C56	5	Stakehole	1.0g						
C59	15	Small pit	0.5g						
C61	19	Large pit	0.4g						
C62	12	Hearth	38.2g	<0.1g					3.9g (burnt clay)
C62	13	Hearth	26.9g						5.4g (burnt clay)
C64	14	Small pit	0.1g	0.3g					
C66	11	Posthole	0.4g	<0.1g					
C80	21	Stakehole	0.3g						
C84	24	Posthole	0.2g						
C84	35	Posthole	0.3g						
C86	29	Posthole	1.5g						
C86	36	Posthole	<0.1g						

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	seeds	burnt animal bone	animal bone	human bone	Heat-affected stone	Other
C88	30	Posthole	0.1g						
C88	37	Posthole	0.4g						
C90	38	Posthole	0.3g						
C92	43	Posthole	0.5g						
C106	39	Posthole	0.1g						
C106	40	Posthole	0.2g						
C106	41	Posthole	0.4g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR131 Shankill 5		
Excavation Registration Number: E3850		
Site director:Richard Jennings		
Date: 30.05.08		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	7 plans	
Site sections, profiles, elevations	5 sections	
Other plans, sketches, etc.		
Timber drawings		
Stone structural drawings		
Site diary/note books		
Site registers (folders)	1	
Survey/levels data (origin information)		
Context sheets	106	
Wood Sheets		
Skeleton Sheets		
Worked stone sheets		
Digital photographs	49	
Photographs (print)		
Photographs (slide)		
Security copy of archive	Yes	IAC Server

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Prehistoric Pottery Report – Eoin Grogan and Helen Roche

Appendix 2.2 Lithics Analysis Report – Farina Sternke

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Appendix 2.5 Burnt Bone Report – Aoife McCarthy

Appendix 2.6 Petrological Report – Stephen Mandal

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

Appendix 2.1 Prehistoric Pottery Report – Eoin Grogan and Helen Roche

N9/N10 Rathclogh to Powerstown

The prehistoric pottery from Shankill 5, Co. Kilkenny (AR131, E3850)

Eoin Grogan and Helen Roche
May 2009

Summary
The site produced a single worn necksherd (weight: 2g) representing a final Neolithic/ early Bronze Age Beaker. The Shankhill 5 material is an important addition to the previously poorly represented distribution of later prehistoric activity on this section of the Nore Valley.

The Beaker pottery
The site produced a single much worn necksherd (weight: 2g) of buff fabric from a final Neolithic/ early Bronze Age Beaker. The fine, well-fired fabric has a medium content of quartzite inclusions. While very little else can be determined from such a small quantity it is possible that the decoration is arranged in horizontal bands.

Shankill is a small but important addition to the cluster of Beaker associated activity in north-east Kilkenny along the west side of the Barrow Valley. Other sites in this area include Paulstown 2, which has a large assemblage, while Garryduff 1 and Blanchvillespark/ Ballyquirk 1, Co. Kilkenny, and Moanduff, Co. Carlow, produced very small quantities (Elliot 2008a; 2008b; Devine and Zimny 2008; Phelan and Zimny 2009; Grogan and Roche 2009a; 2009b; 2009c; 2009d).

References
Devine, E and Zimny, P 2008 E3852 Garryduff 1 Stratigraphic Report. Unpublished Stratigraphic Report. NationalMonuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Elliot, R 2008a E3632 Paulstown 2 Stratigraphic Report. Unpublished Stratigraphic Report. NationalMonuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Elliot, R 2008b E3862 Blanchvillespark/Ballyquirk 1 Stratigraphic Report. Unpublished Stratigraphic Report. NationalMonuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Grogan, E and Roche, H 2009a The prehistoric pottery assemblage from Paulstown 2, Co. Kilkenny (AR146, E3632). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009b The prehistoric pottery assemblage from Garryduff 1, Co. Kilkenny (AR116, E3852). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009c The prehistoric pottery assemblage from Blanchvillespark/ Ballyquirk 1, Co. Kilkenny (AR111, E3862). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Grogan, E and Roche, H 2009d The prehistoric pottery assemblage from Moanduff 2, Co. Carlow (AR155, E3735). N9/N10 Rathclogh to Powerstown. Unpublished Report for Irish Archaeological Consultancy Ltd.

Jennings, R 2008 E3850 Shankill 4 Stratigraphic Report. Unpublished Stratigraphic Report. NationalMonuments Service. Department of the Environment, Heritage and Local Government, Dublin.

Phelan, S and Zimny, P 2009 E3735Moanduff 2 Stratigraphic Report. Unpublished Stratigraphic Report. NationalMonuments Service. Department of the Environment, Heritage and Local Government, Dublin.

CATALOGUE

The excavation number E3850 is omitted throughout: only the context number, in **bold**, followed by the find number is included (e.g. **08**:1). 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 small sherds (generally less than 10mm square) where only one surface has survived while crumbs are very small pieces (≤ 5 x 5mm) generally without surviving surfaces. The inclusions were examined using simple magnification and in some cases attribution reflects probable, rather than certain, identification.
Worn: some wear damage to surfaces and edge breaks much worn: considerable wear damage

Beaker pottery

*Context **01***

Group I. This is represented by a single much worn necksherd (**01**:2) of buff to red-buff fabric with a medium content of quartzite and mica inclusions (≤ 2.8 x 2.5mm, occasionally up to 5.48 x 5mm). Neck thickness: c. 7.15mm; weight: 2g.

Decoration There is a broad (2.2mm), shallow horizontal line with, beneath, two opposed oblique lines forming the apex of a triangle.

Vessel No.	Context/feature	Number of sherds	Rimsherds	Necksherds	Base-anglesherds	Bellysherds	Bodysherds	Fragments	Inclusions	Vessel size (cm)	Weight (g)	Pottery type	Decorated
Group I	01	1	0	1	0	0	0	0	Q M	-	2	Fine Beaker	■

Q quartzite M mica ■ decorated

Table 1. Details of pottery including individual vessels from Shankill 5, Co. Kilkenny.

Vessel	Context	Sherds to draw	Section only	Photograph
Group I	01	N. **01**:2		

R. rim N. neck Be. belly

Table 2. Suggestions for illustration: Shankill 5, Co. Kilkenny.

Appendix 2.2 Lithics Analysis Report – Farina Sternke

LITHICS FINDS REPORT FOR E3850 SHANKILL 5 (A032/154), CO. KILKENNY

N9/N10 ROAD SCHEME – PHASE 4B
FARINA STERNKE MA, PHD

Contents

List of Tables

Introduction

A total of seven lithic finds from the archaeological investigations of a prehistoric site at Shankill 5, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with a prehistoric house with associated gullies, postholes and pits.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3850:001:1	1	Chert	Polished Stone Axe	Slightly weathered		110	53	13	No	No
E3850:010:1	10	Flint	Flake	Heavily Patinated	No	44	23	3	No	No
E3850:034:1	34	Flint	Debitage							
E3850:040:1	40	Flint	Debitage							
E3850:048:1	48	Chert	Natural Chunk							
E3850:050:1	50	Chert	Flake	Slightly weathered	No	21	25	3	No	No
E3850:050:2	50	Chert	Natural Chunk							

Table 1 Composition of the Lithic Assemblage from Shankill 5 (E3850)

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 represent pieces of technological or typological significance, e.g. cores etc. The same is done with natural chunks.

Quantification

The lithics are three flaked pieces of flint and two modified pieces of chert (Table 1). Three artefacts are larger than 20mm in length and/or width and were therefore recorded in detail.

Provenance

The lithic artefacts were recovered from the topsoil and various fills.

Condition:

The recorded lithics survive in slightly weathered (E3850:001:1 and E3850:050:1) and heavily patinated (E3850:010:1) condition. None of the artefacts is complete.

Technology/Morphology:

The artefacts represent two flakes and a macro tool (Table 1).

FLAKES

The two flakes are made of flint (E3850:010:1) and chert (E3850:050:1). Both flakes were produced using the single-platform method. In the case of E3850:010:1, a soft

hammer was used. The flakes measures 44mm and 23mm in length, 21mm and 25mm in width and 3mm and 3mm in thickness, respectively.

The flakes date to the early Neolithic period based on their technology.

DEBITAGE
The presence of two pieces of flint debitage (one burnt) suggests that knapping and/or tool re-sharpening took place at the site.

Macro Tools:
The macro tool is a polished stone axe (E3850:001:1) which is made of chert and survives almost complete condition. It sustained damage to its cutting edge. The axe is a thin-butted example and measures 110mm long, 53mm wide and 13mm thick. It is a characteristic early Neolithic artefact.

Dating:
The assemblage is morphologically and technologically diagnostic and dates to the early Neolithic 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.

Discussion
Flint is available in smaller nodules along the Wicklow, Wexford and Waterford coast or in the glacial tills in Co. Kilkenny in the form of remanié pebbles. The use of a single platform and a bipolar technology on small to medium sized pebbles is in parts the result of this availability. The flint used at Shankill 5 is beach pebble flint which almost certainly derives from the Wicklow, Wexford or Waterford coast. The majority of these flint nodules are rather small pebbles with an average dimension of 30–50mm and often only permit the use of a bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant split pebble bipolar (Neolithic and Bronze Age) character of the south-eastern lithic assemblages (O'Hare 2005).

The chert used at Shankill 5 would have been sourced locally or imported from as far as the Midlands.

Summary
The lithic finds from the archaeological excavation at Shankill 5, Co. Kilkenny are a flint flake, a chert flake, two pieces of flint debitage and a polished stone axe.

The assemblage dates to the early Neolithic period based on its morphological and technological characteristics. The discarded flakes and debitage represent waste from lithic production and the immediate use of lithic tools at the site.

This site makes a minor contribution to the evidence for Neolithic settlement and land use in Co. Kilkenny.

Recommendations for Illustration
- Polished Stone Axe Fragment (E3850:001:1)

References

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Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Site Name- Shankill 5
Excavation number –E3850 AR131
County – Kilkenny
Author- Lorna O'Donnell

Date –16/10/09

Summary Charcoal Report

Illustrations

Figures

Tables

1 Introduction

This report describes the charcoal analysis of samples from Shankill 5 excavated by Richard Jennings. The site was excavated as part of the N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Jennings 2009). The site contained evidence of settlement, with slot trenches and postholes. A radiocarbon date from C62 provided a date range of 1399-1436 AD. The aim of the work is to identify enough suitable material for radiocarbon dating, and to provide a floristic background to the site. It can also identify any species selection patterns at Shankill 5. This report is summary in nature only, –further analysis, discussions and comparisons of results will be incorporated into a final integrated charcoal and wood report for all sites along 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 a high clay content will be soaked in water for 1-2 days to aid the sieving process.

2.2 Charcoal identification

Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine, and examined under a binocular microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have anatomical characteristics that are particular to them, and these are identified by comparing their relevant characteristics to keys (Schweingruber 1978; Hather 2000 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. It was aimed to identify fifty fragments per sample.

2.3 Details of charcoal recording

The general age group of each taxa per sample was recorded, and the growth rates were 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 were 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 was considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The ring curvature of the pieces was also noted – for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Fig. 1). Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). Insect infestation is usually recognised by round holes, and is considered to be caused by burrowing insects. Their presence normally suggests the use of decayed degraded wood, which may have been gathered from the woodland floor or may have been stockpiled.

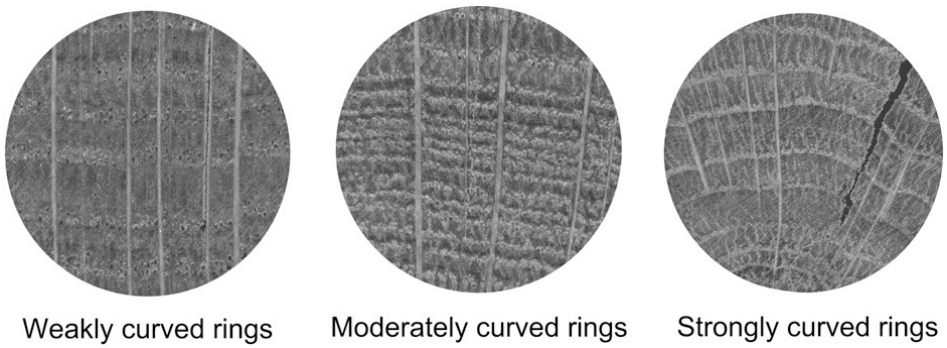

Fig. 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.
(After Marguerie and Hunot 2007 1421, Fig. 3).

2 Results

Charcoal was examined from five contexts at Shankhill 5. Seven wood types were identified, alder (*Alnus* sp.), birch (*Betula* sp.), hazel (*Corylus avellana*), ash (*Fraxinus* sp.) wild/bird cherry (*Prunus avium/padus*), oak (*Quercus* sp.) and elm (*Ulmus* sp.). The results are dominated by oak (Fig. 2).

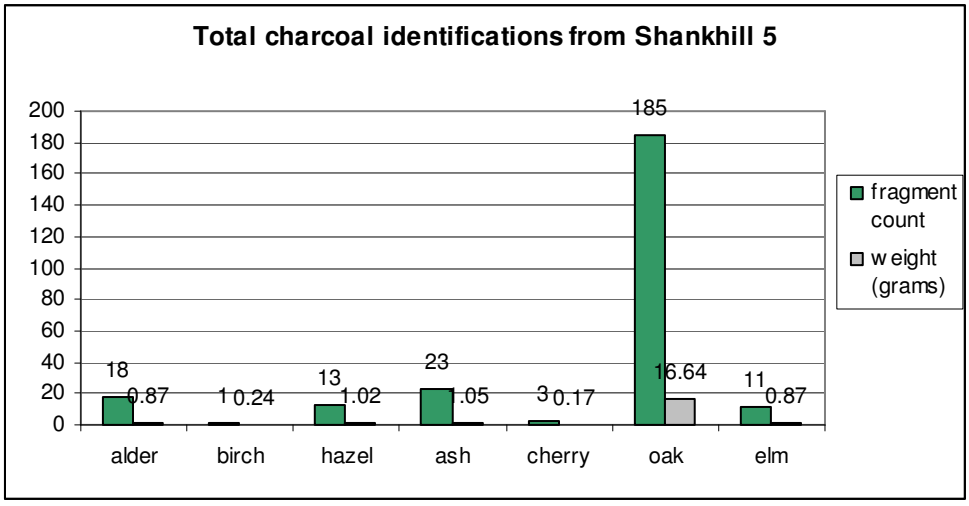

Fig. 2

Charcoal was examined from two postholes **(Cuts 39 and 41**, **Fills 40** and **42**) and a pit (**Cut 33, Fill 34)**. While a variety of trees were identified from the fills, they are dominated by oak, which could suggest the original posts were made from oak. A wide variety of trees were identified from this including alder, birch, hazel, ash, cherry, oak and elm. This variety of taxa could indicate that this deposit was originally a hearth or firing area. Two samples (12 and 13) were examined from C63, a possible hearth pit. The results from the two were very similar, both dominated by oak, with low levels of hazel and ash.

4 Discussion

It is presumed that while people may have managed trees during prehistory in Ireland, that they did not plant them, and therefore that the trees would grow in optimum soil conditions. A consideration of the preferred growth conditions of the trees from Shankill 5 should provide a background to the type of soil conditions close to the site.

The charcoal results from Shankill 5 indicate that the people were gathering fuel from a mosaic of different wood types. Overall, the results are dominated by oak, so it is likely that oak stands or woodlands were growing near to the site. Oak is frequently identified from Irish archaeological sites. It is a strong, robust timber, which burns well at high temperatures. The oak present could be either our native sessile oak (*Quercus petraea*) or our native pedunculate (*Quercus robur*) which prefers more wet, heavier clays than the sessile oak. (Beckett 1979, 40-41).

Two more large canopy trees identified from the site are ash and elm. Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188). Elm trees prefer heavy moist clays and loams but will also grow on chalk soils (Lipscombe and Stokes 2008, 210).

A shrub or scrub element is indicated by the presence of hazel and cherry. Hazel is a very tolerant tree; it can grow from wet to dry conditions (but not waterlogged ones) (Orme and Coles 1985, 9). It was once very common in Ireland, Mc Cracken writes that it was once widespread to an extent that is hard to imagine today (1971, 19). It can grow as a tree or can form hazel scrub. Wild/bird cherry can grow well in light conditions such as near woodland margins (Orme and Coles 1985, 11)

A wetland element is indicated by the identification of alder and birch. Alder needs a constant source of water to grow. It can be seen beside rivers, streams and can form carr woodland. The birch identified could be either downy birch (*Betula pubescens*) or silver birch (*Betula pendula*). Downy birch prefers wet conditions and can often be seen on poorly drained soils (Lipscombe and Stokes 2008, 178). Silver birch prefers light, dry soils (Lipscombe and Stokes 2008, 140).

5 Summary

Charcoal was identified from five contexts at Shankill 5, Co. Kilkenny. Alder, birch, hazel, ash, cherry, oak and elm was identified. The results are dominated by oak. Two posts may have been made from oak. The charcoal indicates that the people at Shankill were gathering fuel and building materials from a variety of woodlands.

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Table 1 Charcoal identification details from Shankill 5

Context number	Cut number	Sample number	Flot weight (g)	Context description	Wood taxon	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Weakly or strongly curved rings	Insect holes	Tyloses	Comment
34	33	22	13.9	Pit Fill	*Alnus* sp. (alder)	15	0.8	5-10	3-4	medium				
					Betula sp. (birch)	1	0.24	5-10	3-4	medium				
					Corylus avellana (hazel)	3	0.07	5-10	2-3	medium	strongly curved			
					Fraxinus sp. (ash)	19	0.81	5-10	3-4	medium				
					Prunus avium/padus sp. (wild/bird cherry)	1	0.01	5	3-4	medium				
					Quercus sp. (oak)	3	0.13	5-10	3-4	medium				
					Ulmus sp. (elm)	8	0.71	5-10	3-4	medium				
40	39	8	4.1	posthole fill	*Alnus* sp. (alder)	3	0.07	5-10	4	medium				
					Corylus avellana (hazel)	6	0.68	5-10	5-8	medium	strongly curved			
					Fraxinus sp. (ash)	1	0.03	5-10	4	medium				
					Prunus avium/padus sp. (wild/bird cherry)	2	0.16	5-10	4	medium				
					Quercus sp. (oak)	40	0.42	5-10	5-10	medium				
					Ulmus sp. (elm)	2	0.08	5-10	3-4	medium				
42	41	6	11.4	posthole	*Quercus* sp. (oak)	49	2.13	5-10	2-4	medium	weakly curved		10%	
					Ulmus sp. (elm)	1	0.08	5	4	medium				
62	63	12	38.2	pit/hearth	*Corylus avellana* (hazel)	3	0.1	5-10	4-5					
					Fraxinus sp. (ash)	1	0.09	5	5					
					Quercus sp. (oak)	46	2.86	5-10	4-8	medium	weakly curved		50%	
62	63	13	26.9	pit/hearth	*Corylus avellana* (hazel)	1	0.07	4	5	medium				
					Fraxinus sp. (ash)	2	0.12	4-5	5	medium				
					Quercus sp. (oak)	47	11.1	5-25	5-6	medium	weakly curved		50%	

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

The Plant Remains Report from
Shankill 5 AR131 E3850
By
Penny Johnston

Introduction

This report details the analysis of plant remains recovered from excavation at Shankill 5. Excavation at Shankill 5 E3850 revealed the remains of a truncated structure. The radiocarbon date suggested a late medieval phase of activity.

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. As a result, only limited interpretation of the plant remains from this site is possible.

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 1–31 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

A total of seven samples contained plant remains: C36 (S33), C12 (S3), C66 (S11), C62 (S12), C36 (S32), C34 (S22) and C64 (S14).

The plant remains included fragments of hazelnut shells and small amounts of barley and wheat grains (Table 28). Both wheat and barley are known from the earliest Irish prehistoric sites (Monk 1985/1986, 31–32) and are relatively common finds in prehistoric settlement deposits. However, the cereal remains from this site were recovered in such small quantities that it is not possible to determine the relative importance of the various different types found in these deposits.

Hazelnut shell fragments are much more common in the deposits from this site, being found in five of the seven samples examined. Hazelnut shell fragments are frequently recovered in samples from Irish archaeological sites. The frequency of these remains in archaeobotanical assemblages is the result of several taphonomic factors that influence its preservation. First of all, the nut shell is dense, and does not decay easily. This means that it is much more likely to survive on archaeological sites than other types of plant material. In addition, it is a waste material that is frequently discarded into a fire after the nut kernel is consumed. Thus it is much more likely to be preserved by carbonisation. Therefore, hazelnut shell fragments are probably over-represented in archaeobotanical assemblages, in relation to its general importance in the plant economy (see Monk 2000 for a detailed discussion). The hazelnut shell fragments from this site are therefore of limited interpretative significance.

Table : Identified plant remains from Shankill 5

Context	**12**	**66**	**62**	**64**	**34**	**36**	**36**
Sample	**3**	**11**	**12**	**14**	**22**	**32**	**33**
Hazelnut shell fragments (*Corylus avellana* L.)		7	2	35	3		7
Barley grains of indeterminate species (*Hordeum* species)						2	
Wheat grains *(Triticum* L. species)	1						
Indeterminate cereal grains					1		

References

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Appendix 2.5 Burnt Bone Report – Aoife McCarthy

Osteoarchaeological Report of Burnt Bone from
E3850 A032/: Shankill 5 AR131
Co. Kilkenny
N9/N10 Kilcullen to Waterford Scheme
Phase 4b: Knocktopher to Powerstown

Author: Aoife McCarthy MA BA
Date: April 2010

Table of Contents

1. Introduction

1.1 Introduction

This report details the osteological analysis of burnt bone samples recovered during excavations at Site E3850 AR131 Shankill 5 in the townland of Shankill, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd in April 2010. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Jennings, R. 2009) and from consulting the original site register documents.

1.2 General Osteological Information

The osteological analysis of burnt bone fragments recovered during sieving of bulk soil samples 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 72 fragments from 59 possible skeletal elements, weighing 5.67g were recorded within the assemblage. The degree of preservation of the burnt bone material recovered varied from moderate to poor. A moderate rate of fragmentation was also noted within the assemblage.

A large portion of the burnt bone assemblage recovered at Shankill 5 originated from C34 the clayey-silt fill of pit feature C33; which accounted for 38 calcined fragments or 52.8% of the total. A charcoal sample retrieved from archaeological context C62 was classified to species and issued for AMS dating. Hazel charcoal from hearth fill C62 returned a two sigma calibrated date of Cal. AD1399–1436 placing the feature within the medieval period.

Due to fragmentation combined with poor preservation and small size of the individual bone fragments it was not possible to identify any of the 72 burnt bone fragments to species; these were classed as indeterminate vertebrate of small, medium or large size. Bone elements were identified where possible.

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. The closely related taxa of sheep and goat are difficult to distinguish and where grouped under the term '*caprinae*'

- 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.

- In order to calculate accurate MNI and MNE figures for each species, bird as well as mammal, a method of zoning was implemented when recording (Serjeantson, 2000). This method was used so as to compensate for any possible biases due to fragmentation; siding was also taken into account at this point.

- 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.

BIOMETRICAL DATA: Due to fragmentation and the nature of burnt bone material recovered measurements and biometrical data analysis were not possible.

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 fragmentation and the nature of burnt bone material recovered from Site AR131 Shankill 5.

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 12 Sample 3
A series of six moderately preserved burnt bone fragments (0.43g) representing 6 possible skeletal elements were identified within silty-clay posthole fill C12. Due to poor preservation and small fragment size it was not possible to identify the long bone diaphysis and unidentifiable burnt bone fragments to species. All 6 bone fragments displayed evidence of exposure to a high level of heat resulting in calcination. Calcination of the bone manifested as surface colour change to white combined with bone cracking. A white or pale grey colour indicates exposure of bone to temperatures in excess of *c.* 600°C combined with a ready oxygen supply (McKinley, 2004). The largest long bone diaphysis fragment retrieved from C12 measured 5mm long by 6mm wide and 4mm thick.

Context 14 Sample 4
Eight moderate to poorly preserved burnt bone fragments (0.36g) representing 6 possible skeletal elements were identified within silty-clay posthole fill C14. Due to poor preservation and small fragment size it was not possible to identify the long bone diaphysis, skull and trabecular burnt bone fragments to species. All 8 bone fragments displayed evidence of exposure to a high level of heat resulting in calcination. Calcination was visible as surface colour change to white combined with

bone surface cracking. 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 alters bone colour (Luff R. & Pearce J. 1994). The largest long bone diaphysis fragment retrieved from C14 measured 6mm long by 5mm wide and 4mm thick. Four of the retrieved burnt bone fragments comprised unidentifiable trabecular bone fragments.

Context 34 Sample 22
A total of 38 moderate to poorly preserved calcined fragments of bone (4.18g) were retrieved from clayey-silt pit fill C34. Due to small fragment size and poor preservation it was not possible to identify the fragments of rib corpus, long bone and unidentifiable trabecular bone to species. Fourteen of the burnt bone fragments recovered from C34 comprised unidentifiable pieces of trabecular bone. Ten calcined fragments of rib corpus were classified as small mammal size whilst a total of 8 fragments of long bone diaphysis were categorised as medium sized mammal.

The largest long bone diaphysis fragment recovered from C34 measured 14mm long by 10mm wide and 3mm thick. All 38 bone fragments retrieved from C34 showed evidence of exposure to a high level of heat visible as cracking and splitting of the bone surface combined with colour change to grey/white. As Devlin J.P. & Herrmann N. P (2008, 109) state “increasing exposure to heat bone progresses through a sequence of colours from unburned tan, to shades of dark brown to black, progressing to blue and grey and finally to white.”

Context 36 Sample 32/33
Seven poorly preserved burnt bone fragments (0.22g) were recovered within clayey-silt posthole fill C36. Poor preservation combined with fragmentation and small fragment size meant it was not possible to identify the rib and skull bone pieces to species. All 7 fragments displayed evidence of calcination resulting from exposure to a high level of heat. This was visible as a colour change to grey/white combined with cracking of the bone surface.

Context 42 Sample 6
A total of 13 poorly preserved burnt bone fragments (0.48g) were retrieved from clayey-silt posthole fill C42. Due to small fragment size, poor preservation and fragmentation it was not possible to identify any of the 13 calcined skull and unidentifiable fragments to species. All 13 fragments displayed modifications consistent with exposure to a high level of heat and resulting calcination. This was visible as cracking of remaining bone surface and colour change to grey/white. A white or pale grey colour indicates exposure of bone to temperatures in excess of *c.* 600°C combined with a ready oxygen supply (McKinley, 2004).

4. Summary
Seventy two burnt bone fragments recovered from archaeological contexts C12, C14, C34, C36 and C42 on Shankill 5 were submitted for examination. The bone samples were assessed and identified to species where possible. Due to size and poor preservation it was not possible to identify any of the 72 burnt bone fragments to species. A series of 24 fragments were classified as small size mammal, whilst a total of 8 calcined fragments were categorised to medium sized mammal. No definite or statistically detailed conclusions could be drawn from the calcined bone assemblage retrieved from Shankill 5 due to its limited size and poor degree of preservation.

Bone Database:

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	W (g)	Comments
1	C42	6	Unid	Unid													G		2	0.06	Poorly preserved calcined fragments of trabecular bone
2	C42	6	Unid Sm Size	Skull													W G		5	0.29	Series of calcined fragments of skull, bone surface shows cracking
3	C42	6	Unid	Unid													W		6	0.13	Series of small calcined fragments of bone
4	C36	32	Unid	Rib													G W		1	0.01	Small calcined fragment of rib corpus, poor preservation
5	C36	32	Unid	Skull													G W		2	0.06	Calcined fragments of skull, shows surface cracking
6	C36	33	Unid Sm Size	Rib													W		4	0.15	Calcined fragments of rib corpus. Surface of fragments shows cracking & trabecular bone exposed
7	C12	3	Unid Sm Size	Long Bone													W G		3	0.38	Series of moderately preserved calcined fragments of long bone diaphysis. Degree of trabecular bone exposed. Largest fragment Length 5mm, Width 6mm, Thickness 4mm
8	C12	3	Unid	Unid													W		3	0.05	Series of calcined fragments of bone. Surface shows cracking
9	C14	4	Unid	Unid													W G		4	0.05	Series of calcined fragments of trabecular bone
10	C14	4	Unid Sm Size	Long Bone													W G		2	0.26	Moderately preserved fragments of long bone diaphysis. Larger fragment Length 6mm, Width 5mm, Thickness 4mm
11	C14	4	Unid	Skull													W G		2	0.05	Poorly preserved calcined fragments of skull bone. Surface cracking
12	C34	22	Unid	Unid													W G		14	1.14	Series of calcined fragments of trabecular bone
13	C34	22	Unid Sm Size	Rib													W		10	0.94	Series of small moderately preserved calcined fragments of rib corpus. Sm size mammal. Largest fragment Length 11mm, Width 8mm, Thickness 2mm
14	C34	22	Unid Med Size	Long Bone													G		8	1.78	Series of poorly preserved calcined fragments of diaphysis. Bone surface shows cracking & splitting. Largest fragment Length 14mm, Width 10mm, Thickness 3mm
15	C34	22	Unid	Unid													G W		6	0.32	Series of poorly preserved calcined fragments of bone.

Key:

C= Context
S=Sample
Anat=Anatomical Element
Prox=Proximal
Dist=Distal
But=Butchery
Bu=Burnt
G=Gnaw
Q=Quantity of Pieces
G=Grey
N=No
Unid=Unidentifiable
Taxa=Taxon
B=Black
W=White
R=Rodent
Cn=Carnivore

5. References:

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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

Appendix 2.6 Petrological Report – Stephen Mandal

PETROGRAPHICAL REPORT ON STONE SAMPLES TAKEN DURING ARCHAEOLOGICAL EXCAVATIONS AT SHANKILL 5 (E3850)
EURGEOL DR STEPHEN MANDAL MIAI PGEO

1. Introduction

This report is based on the macroscopic (hand specimen) examination of stone samples taken during archaeological excavations in advance of the N9/N10 Phase 4b Knocktopher to Powerstown Road Scheme. The purpose of the study was to identify the rock types from which the stone objects were made, to highlight potential sources for them, and to comment on their possible function. It is important to note that macroscopic petrographical studies have been considered of limited value in comparison to microscopic (thin section and geochemical analysis) studies. On the other hand, macroscopic studies provide an excellent preliminary assessment tool and have proven to be of considerable value in petrographical studies (e.g. see Mandal 1997; Cooney and Mandal 1998).

2. Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)

The bedrock under the site consists of crinoidal wackestone/ packstone limestone belonging to the Ballyadams Formation (shown on Figure 1 as BM).

The stratigraphical sequence in the area consists of the following. Gaps in the stratigraphically sequence are represented by line breaks.

Carboniferous (Silesian)

Coolbaun Formation (CQ) – Shale and mudstone with this coals

Moyadd Coal Formation (MC) – Shale, siltstone and minor sandstone
Bregaun Flagstone Formation (BE) – Thick flaggy sandstone and siltstone
Killeshin Silstone Formation (KN) – Muddy siltstone and silty mudstone
Luggacurren Shale Formation (LS) – Mudstone and shale with chert and limestone

Carboniferous (Dinantian)

Clogrenan Formation (CL) – Cherty, muddy calcarenite limestone
Ballyadams Formation (BM) – Crinoidal wackestone/ packstone limestone
Milford Formation (MI) – Peloidal calcarenite limestone
Butlersgrove Formation (BU) – Very dark grey argillaceous limestones

Ballysteen Formation (BA) – Fossiliferous dark-grey muddy limestone
Ballymartin Formation (BT) – Limestone and dark grey calcareous shales
Quinagh Formation (QU) – Lenticular mudstone and coarse siltstone

Porter's Gate Formation (PG) – Sandstones, shales and thin limestones

Devonian

Kiltorean Formation (KT) – Yellow and red sandstones, green mudstones
Carrigmaclea Formation (CI) – Red, brown conglomerates and sandstones

Ordovician

Oaklands Formation (OA) – Green, red-purple, buff shale, siltstone
Maulin Formation (MN) – Dark blue-grey slate, phyllite, schist

Igneous Intrusions

The Tullow Pluton (Tw) – Fine to coarse granites dating to *c.* 405Ma

The geology of the area is generally dominated by Lower Carboniferous Age rocks, principally limestones. These rocks, which also make up much of the Midlands of Ireland, represent the northward return of the sea at the end of the Devonian, *c.* 360

million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

To the south of the study area occur Ordovician-Devonian Age rocks. The Devonian Age rocks consist of coarse sandstone and conglomerates representing terrestrial sediments resulting from a period of tectonic uplift.

The older, Ordovician Age rocks represent tectonic activity, relating to the closure of the Iaepetus Ocean, a major ocean which at its widest was probably greater than 3000km across. These rocks have been metamorphosed to slates, phyllites and schists by the intrusion of the Tullow granite pluton *c.* 405 million years ago.

Bedrock is not exposed at surface at the site; instead the overburden consists of boulder clay; surface drift from early glaciations. The area is part of a physical region known as the Caledonian province of the south-east. The soils of the area consist of acid brown earths (Aalen et al. 1997).

3. Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Shankill 5	A032/154	AR131	E3850	9	40/ 57	Not altered;	Angular;	Sandstone, very coarse grained, quartz rich, red/yellow
Shankill 5	A032/154	AR131	E3850	22	34	Burnt;	Sub-rounded to Angular;	Sandstone, coarse grained, red

4. Potential Sources

Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The dominant rock type in the area is limestone. Whilst there are minor sandstones within some of the limestone formations, the closest bedrock source for coarse grained yellow / red sandstone is within the Devonian Age Kiltorean Formation (yellow and red sandstones, green mudstones) and Carrigmaclea Formation (red, brown conglomerates and sandstones) (see Figure 1, shown as KT and CI respectively). It is important to note that these rock types were not necessarily sourced from bedrock. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally.

5. Discussion

Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

A total of 159 samples were examined from the scheme across 33 sites (see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; very coarse to medium grained sandstone, typically red to yellow in colour. All samples contained a variation of this type of rock as their principal component. Just under half (73) of the samples are clearly burnt / altered, but this does not rule out the possibility that the stone from other samples had been burnt. All bar one (a sample from Kellymount 5 (E3858:43:156)) contained angular pieces of stone, and 122 (77%) also contained sub-rounded to rounded pieces. A total of 63 of the samples contained pebbles and / or cobbles, in most cases broken. Five of the samples contained minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Pebbles	Limestone
Kilree 1	A032/107	AR091	E3728	1	0	1	0	0	0
Dunbell Big 2	A032/130	AR095	E3853	1	1	1	1	0	0
Holdenstown 4	A032/101	AR100	E3682	7	7	7	7	0	0
Rathcash 1	A032/133	AR102	E3859	3	0	3	3	3	0
Rathcash 2	A032/134	AR103	E3860	12	12	12	12	12	0
Rathcash East 2	A032/136	AR105	E3893	3	0	3	3	0	0
Blanchvillespark 3	A032/140	AR109	E3913	3	0	3	3	3	0
Blanchvillespark 4	A032/141	AR110	E3914	3	3	3	0	0	0
Ballyquirk 1	A032/143	AR112	E3863	1	1	1	1	0	0
Ballyquirk 2	A032/144	AR113	E3864	5	5	5	1	0	0
Ballinvally 1	A032/146	AR115	E3836	1	0	1	1	0	0
Garryduff 1	A032/147	AR116	E3852	4	0	4	0	0	0
Jordanstown 2	A032/151	AR120	E3851	4	4	4	0	0	0
Kellymount 6	A032/122	AR121	E3758	3	3	3	3	0	0
Jordanstown 3	A032/152	AR122	E3916	2	2	2	2	2	0
Kellymount 2	A032/111	AR124	E3757	11	4	11	11	9	1
Kellymount 3	A032/112	AR125	E3856	13	2	13	2	0	1
Kellymount 5	A032/114	AR127	E3858	27	10	26	24	21	3
Shankill 4	A032/153	AR130	E3838	5	1	5	4	0	0
Shankill 5	A032/154	AR131	E3850	2	1	2	1	0	0
Moanmore 1	A032/156	AR133	E3835	6	1	6	1	0	0
Moanmore 2	A032/157	AR134	E3843	2	0	2	2	0	0
Bannagagole 1	A032/159	AR136	E3844	3	2	3	3	3	0
Moanduff 1	A032/160	AR137	E3839	7	1	7	7	3	0
Coolnakisha 1	A032/128	AR139	E3768	1	0	1	1	1	0
Cranavonane 1	A032/164	AR141	E3842	2	2	2	2	2	0
Tomard Lower 1	A032/117	AR144	E3733	1	0	1	1	1	0
Paulstown 1	A032/093	AR145	E3642	3	1	3	3	2	0
Rathgarvan or Clifden 1	A032/125	AR147	E3760	1	0	1	1	0	0
Maddockstown 1	A032/126	AR148	E3759	3	3	3	3	0	0
Leggetsrath East 1	A032/118	AR154	E3734	1	1	1	1	0	0
Moanduff 3	A032/120	AR156	E3736	1	0	1	1	1	0
Ballyquirk 4	A032/167	AR157	E3848	17	6	17	17	0	0
Grand Total :				**159**	**73**	**158**	**122**	**63**	**5**

Table 2. Results of petrographical analysis of stone samples from the N9/N10 Phase 4b Road Scheme

Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles are clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

6. References

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Appendix 2.7 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 dataset: intcal04.14c (UBA 12238)

Calibration dataset: intcal09.14c (UBA 15417)

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C62, fill of hearth	12	Charcoal	*Corylus avellana* / 0.39g	QUB	UBA 12239	AMS (Std)	AD1409–1426 (1 sigma), AD1399–1436 (2 sigma)	523±18	-28.8
C34, fill of pit	22	Charcoal	*Corylus avellana* / 0.07g	QUB	UBA 15417	AMS (Std)	784–953BC (1 sigma), 791–547 (2 sigma)	2527±24	-28.8

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 RMPS IN AREA

RMP No	Description
CW015-006	Ringfort
CW015-014	*Fulacht fiadh*
KK016-002	Hearth
KK016-003	*Fulacht fiadh*
KK016-004	Ringfort
KK016-005	Ringfort
KK016-007	Ringfort

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 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	E3456	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	E3458	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
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
Stonecarthy West 2	UA2	E3974	Tim Coughlan	251372/142037
Rathduff Bayley 1	UA4	E4011	Tim Coughlan	251005/143564