

Final report for excavations

**Kilemly
Co. Tipperary
N8 Cashel to Mitchelstown Road Improvement Scheme**

Ministerial Direction Scheme No. A035/000
Registration No. E2126

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On behalf of
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For
South Tipperary County Council

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Final Archaeological Excavation Report**

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Abstract

This report describes the final results on the excavation and post-excavation analysis of two sites (203.3 and 203.4) carried out under registration number E2126. Site 203.3 produced evidence for structural remains and settlement activity dating from the Middle and Late Bronze Age. During the Middle Bronze Age domestic activity was carried out on the southern end of the site. The second phase of occupation dated to the Late Bronze Age and was characterised by the remains of three possible structures and a series of related features spread across the site. The most substantial of these structures (Possible Structure 1) stood on the centre of the site and was characterised by a series of pits and post holes and a central hearth.

Two phases of activity were also identified on Site 203.4. During the Late Bronze Age three cremations burials were placed in simple un-lined pits on the west end of the site. The second phase of activity was characterised by a series of structural remains of no coherent ground plan and numerous pits that seem to have been domestic in function. These features were dated to the Iron Age. A small assemblage of prehistoric pottery and flint tools was recovered during excavation and environmental evidence was gained from the analysis of charcoal and plant remains.

1 Introduction

- 1.1 This report gives the final results of excavations carried out along a section of the N24 link of the N8 Cashel to Mitchelstown Road Improvement Scheme (A035/000) (Fig. 1). Three sites were excavated under number E2126; sites 203.3a, 203.3 and 203.4. These were all located in the townland of Kilemly in the parish of Cahir, Co. Tipperary (Fig. 2).
- 1.2 Site 203.3a was located at NGR E206920.5 N 126524.7, Site 203.3 at NGR E 206988.1 N 126486.4; and Site 203.4 at E 207063.2 N 126422.3. One of these sites (Site 203.3) was identified during advance testing carried out along the road take (05E0875; McQuade 2005). The other sites were identified during monitoring of topsoil stripping carried out by the writer in 2006 (A035/001, Registration No. E2279).
- 1.3 Topsoil stripping by mechanical excavators commenced without prior notice to the archaeologist on 3rd March 2006. The sites were identified by the writer and further areas were stripped of topsoil under archaeological supervision. An area of 2250m² was stripped of topsoil around Site 203.3 and 864m² was stripped for Site 203.4. The excavation of these sites was carried out between 4th March and 25th April 2006.
- 1.4 Site 203.3a comprised part of a field ditch and a single isolated posthole. The excavation of this site is fully detailed in the preliminary report on E2126 (McQuade 2006). This report details the final excavation results of Sites 203.3 and 203.4.

2 Brief Archaeological Background

- 2.1 Sites 203.3 and 203.4 lay in an area of known archaeological significance. The earliest sites recorded in the vicinity date from the Neolithic. A Late Neolithic structure and the remains of a middle to late Bronze Age settlement site were excavated at Curraghatoor (TI087:007), near Cahir (Doody 2007). Recorded sites in the vicinity include two enclosures (TI075:043 (01–02)) located *c.* 200m to the southwest in the townland of Kilemly. These were subject to test excavation but no dating evidence was uncovered (Henry 1999). A possible dwelling is also recorded in that townland (TI075:042). A large fort (TI075:038) is located *c.* 650m to the northwest at Kedrah and a pair of ring forts (TI075:039) and an enclosure (TI075:040) are also recorded in the same townland. Three crop mark enclosures listed on the RMP (TI076:034/01-03) in the adjoining townland of Suttonrath are located just 100m to the east of Site 203.3. An upstanding enclosure (TI076:035) is recorded in the same town land, 230m to the east.
- 2.2 In addition to the known sites several previously unrecorded sites were excavated in advance of the N8 improvement scheme and N24 link road (Fig.1). Sites excavated in close proximity include an area of Early Medieval occupation located 150m to the southeast in Suttonrath at Site 204.1 (E2127 McQuade 2007a) (Fig. 2). There was a Neolithic settlement (Site 206.1) 650m to the southeast and Bronze Age settlements (Site 206.2 and 206.3) at Suttonrath 710m to the southeast (E2128, McQuade 2007b) (Fig. 2). Settlements dating from the Early through to the Late Bronze Age were uncovered at Ballylegan 900m to the southeast (E2265; McQuade 2007c). There was also evidence for Early Iron Age activity at Site 206.4 (E2265; McQuade 2007c).

3 Site 203.3

3.1 Introduction

This site was located on a south-facing slope at an elevation (66.33m O.D) which commanded good views of the surrounding area, most notably the Galtee Mountains to the west (Pl. 1). It was sited on well drained land, 1km northeast of the river Suir (Fig. 1).

The area of excavation was sub-rectangular in plan and measured 90m (northwest-southeast) by 25m (northeast-southwest). The stratigraphy on this site comprised up to 0.45m of topsoil and plough soil F1 overlying natural subsoil F2. The subsoil was compact yellow brown sandy silt.

The site had been truncated by agricultural activity notably ploughing and more recently by site works which had commenced without prior notice to the archaeologist. Following the removal of topsoil the remains of settlement activity were identified. Three possible structures were represented by clusters of pits and postholes. Further settlement evidence came from a series of hearths and pits scattered across the site.

Most of the features were cut into natural subsoil F2 and in the absence of a stratigraphic sequence, dating is based on analysis of the pottery finds and the results of radiocarbon analysis. On this basis three phases of activity were evident on site. The first two phases date from the Middle Bronze Age and the Late Bronze Age respectively but the date of Phase 3 was not determined.

Phase 1	Middle Bronze Age settlement.
Phase 2	Late Bronze Age settlement.
Phase 3	Undated agricultural activity.

3.2 *Phase 1 Middle Bronze Age*

The earliest evidence of activity came from two distinct clusters of features on the southeastern end of the site. The first of these comprised two hearths and a series of postholes at the southeastern limit of excavation. The second cluster of features was located 10.50m to the west and comprised a group of pits and a single stake hole associated with another hearth (Figs. 4 and 5). There were not sufficient structural remains to indicate that any of these hearths were enclosed within a building and the post holes associated with the southeastern hearth were most likely the remains of some form of hearth furniture. A sample of charcoal from the southeastern hearth was dated by radiocarbon analysis to the Middle Bronze Age (1734-1530 cal BC) (UB-7205) (Appendix 10). The proximity of the other cluster of features suggests that they probably date from the same period.

3.2.1 *Hearths*

There was a sizable hearth pit F3 on the southeastern corner of the site. It was oval in plan with maximum dimensions of 1.20m by 0.83m. It had a u-shaped profile and was 0.20m in depth (Fig. 5). The base of the pit was scorched red F37 as a result of the burning that had taken place within it. There were two fills within the pit indicating that it had been fired on at least two occasions (Pl. 2). The lower fill F36 was dark brown sandy clay and was 0.12m deep. The upper fill F4 was dark brown sandy clay with regular inclusions of charcoal and very occasional fragments of burnt animal bone. The level of charcoal within the fill was low and only small fragments were present. This may suggest that the hearth was cleaned after its final use, or that it burnt at a high temperature reducing a lot of the wood to ash. A sample of charcoal was identified as oak, elm, hazel, cherry and pomaceous fruitwood (Appendix 7). The bone pieces were too small to be identified to species, but plant remains within the fill were identified as barley (*Hordeum* sp.), indeterminate cereal grains, indeterminate grass seeds (Graminae) and arable weeds including orache (*Atriplex* sp.), smartweeds (*Persicaria* sp.), fat-hen (*Chenopodium cf album*), and members of the knotweed family (Polygonaceae) (Appendix 8). A Middle Bronze Age date of 1734-1530 cal BC (UB-7205) was obtained for charcoal from the upper fill F4 (Appendix 10).

A second smaller hearth pit F32 was located 0.50m to the north of F3. This pit was sub-circular in plan measuring 0.59m by 0.46m. It was u-shaped in profile with a

depth of 0.17m. It was filled by mid-brown sandy clay F31 which was partly sealed by F35, dark brown sandy clay with frequent inclusions of charcoal (Fig. 5).

3.2.2 Postholes

There were four postholes (F41, F26, F28 and F30) encircling the northern edge of the hearth pit F32 (Fig. 5). These varied from 0.09m to 0.30m in width (Table 1). Their proximity to the hearth suggests that they may have been part of a structure, such as a drying rack, used in association with the hearth.

Table 1 Dimensions of post holes associated with hearth F32

Feature No.	Diameter/length x width mm	Depth mm	Orientation	Shape in plan	Sides	Base	Fill
F30	0.09m x 0.05m	0.05m	vertical	sub-rectangular	straight	flat	F29 grey brown sandy clay
F26	0.11m x 0.08m	0.05m	vertical	sub-rectangular	straight	concave	F25 grey brown sandy clay
F28	0.10m x 0.08m	0.60m	vertical	sub-rectangular	straight	flat	F27 grey brown sandy clay
F41	0.30m x 0.23m	0.24m	vertical	oval	straight	pointed	F42 grey brown sandy clay

3.2.3 Hearth and Storage Pits

Another hearth F7 and a group of five pits F10, F12, F16, F18 and F5 were located 10.50m to the west of the hearths F3 and F32 and their associated post holes.

The hearth pit F7 was sub-circular (0.60m by 0.64m) in plan. It had a u-shaped profile and was 0.40m deep with an uneven base (Fig. 8). The base of the pit was orange brown F38, probably as a result of fire scorching. It was overlaid by dark brown silty clay with frequent charcoal inclusions F8 (Pl. 3). A sample of charcoal from the fill was identified as oak, willow, hazel, cherry, pomaceous fruitwood and elm (Appendix 7). Small quantities of barley, indeterminate cereals, smartweed, knotweed, and hazelnut shell fragments were also recovered. The sample contained almost exclusively charred crab apple (cf *Malus sylvestris*) (Appendix 8). It is likely that these represent the remains of crab apples that had been dried in the hearth since drying these fruits would have caused them to sweeten and made them more palatable. There were a few fragments of burnt animal bone within F8, but these were too small to be identified to species.

The five pits F10, F12, F16, F18 and F5 were spread around the hearth F7 and were almost certainly in contemporary use (Fig. 5). The smallest of these F10 was just 0.50m west of the hearth F7. It was circular in plan measuring 0.40m in diameter. It had a v-shaped profile and was 0.64m in depth (Fig. 8; Pl. 4). Two flint flakes (E2126:1 and E2126:2), both of which were burnt, were recovered from the pit. Both of these were unutilised incomplete tertiary flakes (Appendix 4). The three larger pits ranged in size from 0.73m by 0.64m (F12) to 1.64m by 0.98m (F16). They all had u-shaped profiles and were between 0.15m and 0.23m in depth. The smallest of these pits F12 (Pl. 5) was set in close proximity (0.15m) to F10. Another pit F18 was 0.80m to its south and F16 was located 1.10m southeast of the hearth F7 (Fig. 5).

Another small oval (0.50m by 0.36m) pit F5 was located 2m to the south of the pit F16. It had a u-shaped profile and was 0.07m in depth. Most of the pits had similar fills of mid-brown silty sand F11, F17 and F15. Although F10 was filled with silty clay F9, and there were two fills within F5 (Pl. 6). These were dark brown silty clay F39 and mid-brown sandy clay F6. The exact function of these pits is not clear. There was no evidence that the pits had been used for cooking and since there were no inclusions within their fills it is unlikely that they were used as containers for domestic refuse. The balance of evidence would suggest that they were used for storage purposes.

3.2.4 *Stake hole*

There was a single stakehole F14 located 0.90m to the south of the hearth F7. It measured 0.06m by 0.08m and was 0.12m deep. It was filled by F13 loosely compacted light brown silty clay.

3.2.5 *Summary of Phase 1*

Phase 1 was characterised by an unenclosed area of domestic activity on the southern end of the site. It was defined by a series of hearths and pit features. The evidence recovered from the excavation of these features indicates that the occupants of the site were engaged in crop husbandry. Two flint flakes were recovered but no debitage was found and therefore there was no clear evidence that flint was being manufactured on site.

3.3 *Phase 2 – Late Bronze Age*

The second phase of activity was characterised by a distinct cluster of pits and post holes representing the remains of a possible structure on the central part of the site (Fig. 4). The remains extended over an area of approximately 8m east-west by 6m north-south. Central to this area was a hearth F85 and several cooking pits (Fig. 6). These features were representative of domestic activity which was probably carried out within a structure of some sort. There were several post holes surrounding the hearth and pit features on this part of the site. Their layout did not form a recognisable foundation plan. However the overall arrangement of features on this part of the site suggests that a sub-circular structure (Possible Structure 1) may have stood on this location (Fig. 6). The results of radiocarbon analysis indicate that Possible Structure 1 was occupied during the Late Bronze Age (1256-1012 cal BC) (UB7206) (Appendix 10), several hundred years later than the Phase 1 domestic settlement evident on the southeastern end of the site.

3.3.1 *Possible Structure 1*

There was a series of fourteen post holes set around the central area. The post holes ranged from 0.10m to 0.42m in width and were between 0.12m and 0.40m in depth (Table 2). Although their layout did not form a coherent foundation plan, the majority of these post holes were set around the periphery of the area, which suggests that they were more than likely the remains of a structure that once stood on this part of the site.

The structure probably had a northwest-facing entrance, since there was a distinct absence of structural features in this area (Fig. 6). The eastern side of the entrance was delimited by two postholes F120, F205 and a small slot foundation F116 (Fig. 6). The slot foundation was rectilinear (0.55m x 0.25m) in plan and was 0.10m deep. It had gradually sloping sides and a concave base giving it a u-shaped profile. It was filled by mid-grey brown sandy clay with regular inclusions of charcoal F115. There were no clear structural elements defining the western edge of the entrance.

3.3.2 *Post holes*

A row of five post holes F56, F239, F94, F278 and F96 may represent the northern wall of the structure. The post row was 0.60m to the southeast of the slot trench F116 at the entrance way. The post holes were set at irregular intervals and extended for

4.60m northwest-southeast. Most of the other post holes were set around the periphery of the central area. They varied in size and were set at very irregular intervals but it is possible that they could be the remains of walls. Two post holes F58 and F60 were set at the eastern edge of the central area, 1.05m to the south of the northern post row. Four other post holes were located at the southern and western peripheries of the central area. The southern post holes F105 and F215 were very substantial (Table 2) and were set just 0.50m apart. The posthole F209 was at the southwestern limit of the central area, 2m northwest of F215 and there was another post hole F122 (Pl. 7) 1.65m to its north. Three other post holes F111, F72 and F161 were almost certainly internal to Possible Structure 1 and they may have held roof-supporting posts. The smallest of these F161 was in the vicinity of the hearth F85, the second F72 was 0.50m to its south and the third F111 was 1.40m further southeast (Fig. 6).

Table 2 Details of Postholes forming Possible Structure 1 on the central area of site

Feature No.	Diameter /length x width	Depth	Orientation	Shape in plan	Profile	Base	Fill
F120	0.23m x 0.14m	0.12m	vertical	oval	u-shaped	concave	F119 sandy clay with occasional inclusions of charcoal
F205	0.17m	0.28m	vertical	circular	u-shaped	concave	F204 sandy clay with occasional inclusions of charcoal
F56	0.25m	0.18m	vertical	circular	u-shaped	concave	F55 sandy clay with occasional inclusions of charcoal
F239	0.08m x 0.10m	0.12m	vertical	oval	u-shaped	concave	F238 sandy clay with occasional inclusions of charcoal
F94	0.35m x 0.23m	0.23m	vertical	oval	v-shaped	pointed	F93 mid-brown silty sand with charcoal inclusions
F276	0.10m	0.18m	vertical	circular	u-shaped	concave	F275, F280 mid-brown silty sand with charcoal inclusions
F96	0.28m x 0.20m	0.20m	vertical	oval	u-shaped	concave	F95 sandy clay with occasional inclusions of charcoal. Stone packing
F159	0.35m	0.30m	vertical	circular	u-shaped	concave	F158 orange brown sandy clay with occasional inclusions of charcoal
F60	0.15m x 0.13m	0.12m	vertical	circular	u-shaped	flat	F59 mid-brown sandy silt
F111	0.27m x 0.20m	0.40m	vertical	sub-circular	u-shaped	concave	F112 mid-brown silty sand with charcoal

							inclusions
F105	0.42m x 0.33m	0.15m	vertical	sub- circular	u- shaped	Flat	F106 yellow brown silty sand with charcoal inclusions
F215	0.25m x 0.22m	0.22m	vertical	sub- circular	u- shaped	Concave	F214 dark grey brown sandy clay with occasional inclusions of charcoal
F209	0.15m x 0.14m	0.10m	vertical	sub- circular	u- shaped	concave	F208 mid-brown silty sand with charcoal inclusions
F122	0.37m x 0.33m	0.37m	vertical	sub- circular	u- shaped	concave	F121 mid-brown silty sand with charcoal inclusions
F161	0.18m x 0.14m	0.23m	vertical	oval	v- shaped	pointed	F160 dark grey brown sandy clay with occasional inclusions of charcoal
F72	0.31m x 0.28m	0.33m	vertical	rectangular	v- shaped	pointed	F71 sandy clay with occasional inclusions of charcoal
F230	0.10 x 0.08m	0.13m	Vertical	oval	u- shaped	concave	F231 sandy clay with occasional inclusions of charcoal

3.3.3 *Internal features*

A hearth, a series of associated stake holes and several pits were located internally to Possible Structure 1 (Fig. 6). These features represent domestic activity that was almost certainly carried out within the structure.

3.3.4 *Hearth and associated stakes*

The hearth F85 was located at the centre of Possible Structure 1. It measured 0.70m by 0.50m and comprised scorched earth and heat affected stone on top of which was a deposit of charcoal (Pl. 8). A sample of hearth material was analysed and it was noted that the charcoal fragment level was low, with only eleven fragments identifiable. Hazel, ash, oak and pomaceous fruitwood were identified indicating that these woods were burned as fuel (Appendix 7). A sample of hearth material was scanned for plant remains but none were found (Appendix 8). The remains of thirty stakes were associated with the hearth. These had an average diameter of 0.07m and varied from 0.03m to 0.11m in depth (see Table 3). There were two stakes (F188, F134) in the centre of the hearth but most were around the edges of the feature, which suggests that they may have been part of a cooking platform, drying rack/s or some other type of hearth furniture. Hazel, pomaceous fruitwood, elm, ash and oak were identified in a sample of charcoal from one of the stake holes F138 (Appendix 7). This variety of

species probably represents the remains of fuel burnt on the hearth rather than wood used for structural purposes. Charcoal from another stake hole F135 has been dated to the Late Bronze Age (1256-1012 cal BC) (UB-7206) (Appendix 10).

Table 3 Details of stake holes associated with hearth F85

Feature No.	diameter/ length x width	depth	fill
F86	0.04m	0.03m	mid-brown grey silty clay with charcoal inclusions
F134	0.08m x 0.07m	0.04m	mid-brown grey silty clay with charcoal inclusions
F135	0.10m x 0.09m	0.14m	mid-brown grey silty clay with charcoal inclusions
F138	0.12m x 0.08m	0.06m	mid-brown grey silty clay with charcoal inclusions
F139	0.05m x 0.07m	0.06m	mid-brown grey silty clay with charcoal inclusions
F140	0.08m x 0.06m	0.05m	mid-brown grey silty clay with charcoal inclusions
F141	0.08m x 0.06m	0.07m	mid-brown grey silty clay with charcoal inclusions
F143	0.06m	0.08m	mid-brown grey silty clay with charcoal inclusions
F144	0.07	0.08m	mid-brown grey silty clay with charcoal inclusions
F145	0.06m x 0.04m	0.04m	mid-brown grey silty clay with charcoal inclusions
F146	0.08m	0.07m	mid-brown grey silty clay with charcoal inclusions
F147	0.06m	0.07m	mid-brown grey silty clay with charcoal inclusions
F162	0.06m	0.07m	mid-brown grey silty clay with charcoal inclusions
F163	0.06m		mid-brown grey silty clay with charcoal inclusions
F164	0.06m x 0.03m	0.07m	mid-brown grey silty clay with charcoal inclusions
F165	0.05m	0.06m	mid-brown grey silty clay with charcoal inclusions
F172	0.07m x 0.05m	0.05m	mid-brown grey silty clay with charcoal inclusions
F173	0.06m x 0.05m	0.03m	mid-brown grey silty clay with charcoal inclusions
F174	0.06m x 0.04m	0.05m	mid-brown grey silty clay with charcoal inclusions
F175	0.03m x 0.05m	0.03m	mid-brown grey silty clay with charcoal inclusions
F176	0.05m x 0.04m	0.03m	mid-brown grey silty clay with charcoal inclusions
F177	0.04m	0.03m	mid-brown grey silty clay with charcoal inclusions
F188	0.04m	0.10m	mid-brown grey silty clay with charcoal inclusions
F189	0.09m x 0.07m	0.09m	mid-brown grey silty clay with charcoal inclusions
F192	0.03m	0.08m	mid-brown grey silty clay with charcoal inclusions
F193	0.02m	0.06m	mid-brown grey silty clay with charcoal inclusions
F198	0.13m x 0.06m	0.06m	mid-brown grey silty clay with charcoal inclusions
F199	0.12m x 0.07m	0.08m	mid-brown grey silty clay with charcoal inclusions

F202	0.07m x 0.05m	0.04m	mid-brown grey silty clay with charcoal inclusions
F203	0.08m x 0.08m	0.11m	mid-brown grey silty clay with charcoal inclusions

3.3.5 Pits

A series of pits surrounded the hearth F85 and would have been enclosed within Possible Structure 1. Several cooking pits (F118, F78, F82 and F80) and numerous smaller pits were probably used in association with the hearth. Other pits (F62, F88, F74 F76, F24 and F207) may have been used for storage purposes and subsequently have been backfilled with domestic refuse after they went out of use. Another pit (F84) may have been dug for waste disposal.

3.3.6 Cooking pits F118, F78, F82 and F80

There was a cooking pit F118 within the western end of Possible Structure 1 (Fig. 6). It measured 0.40m by 0.47m and was 0.22m deep with a u-shaped profile. There was evidence for *in situ* burning at the base of the pit and it was filled by grey brown silty sand with occasional inclusions of charcoal F117. A decorated stone spindle whorl (E2126:15) was recovered from F117 (Pl. 28, Fig.11) (Appendix 5). Another pit F78 was located just south of the northern post row F56, F239, F94, F276 and F96 (Fig.6). It was oval (0.87m by 0.68m) in plan and was 0.55m deep. It had a u-shaped profile and had two fills F98 and F77 (Pl. 10). The fills of these pits F117, F98 and F77 were similar. They comprised dark grey brown sandy clay with regular inclusions of charcoal and small (0.02m – 0.07m) fire-cracked stone. A sherd of coarse ware pottery (E2126:4) was recovered from the upper fill F77 of pit F78 (Appendix 3).

Two more cooking pits F82 and F80 appear to have been external to Possible Structure 1. However, their proximity to the other features on the central part of the site indicates that they were almost certainly contemporary with the occupation of the structure. There was a large cooking pit F82 0.60m north of the post row F239, F94, F276 and F96 which defined the northern wall of Possible Structure 1. This pit was oval in plan measuring 1.62m by 0.94m. It had a sharp break of slope on its northern end with more gradually sloping sides at the south (Pl. 9). The base was rather uneven and the pit was 0.21m in depth (Fig. 5). There were a series of stake holes (F150, F151, F218, and F219) around the western edges of this pit. These ranged from 0.04m to 0.08m in diameter and were between 0.04m and 0.09m deep. The base of

the pit F82 was fire-reddened F97 as a result of the burning that had taken place within it and it was filled with fire debris: black brown sandy silt with frequent inclusions of charcoal and occasional small stones F81. Plant remains from the fill were identified as arable weed seeds and included docks (*Rumex* sp.), knotweeds (Polygonaceae), smartweeds (*Persicaria* sp.), fat-hen (*Chenopodium* sp.), members of the mustard family (Brassicaceae), bedstraw (*Galium aparine*), and orache (*Atriplex* sp.) (Appendix 8).

There was a smaller pit F80 1.40m southeast of F82. It was sub-circular (0.40m by 0.45m) in plan with steeply sloping sides and an uneven base (Fig. 6). The fill of this pit F79 was almost identical to the material filling F82. It comprised dark grey brown sandy clay with regular inclusions of charcoal and small (0.02m – 0.07m) fire-cracked stone. Charcoal from F79 was identified as oak, elm, holly, ash and cherry and the sample was dominated by oak. These species were used as fuel for cooking. There was evidence for the presence of oak heartwood which would have been an ideal fuel and the hazel and holly pieces were quite degraded, with many insect holes, suggesting that these were collected as dead wood, or that they may have been stock piled prior to being used (Appendix 7).

3.3.7 Storage Pits F62, F88, F74 F76, F24 and F207

Six storage pits were located around the southern and western periphery of the central hearth F85. There was no evidence that these pits had held heated material and it is likely that they may have held foodstuffs or other organic matter.

The largest of the pits F62 was located 1.60m to the southeast of the hearth F85 and was at the southern end of the central area. It was oblong in plan measuring 1.80m by 0.85m and 0.37m in depth. It had straight sides and a concave base and was filled by F108 and F61 (Pl. 11). The lower fill was light to mid-grey brown sandy clay with occasional charcoal flecks and sub-angular sandstone pieces F108. Three sherds of coarse ware pottery (E2126:12-14) were recovered from this fill (Appendix 3). The upper fill was mid- to dark grey silty sand with occasional inclusions of heat affected sandstone and burnt clay F61 (Fig. 6). There was no evidence for burning within this pit and the upper fill was probably back-filled waste from the hearth F85.

There were two smaller oval pits F88 and F74 to the northwest of F62. These were located 0.35m (F88) and 0.85m (F74) from F62 and just 0.70m from the hearth F85. They measured 0.85m by 0.46m and 0.98m by 0.58m respectively. They had u-shaped profiles and were 0.20m in depth. There were three stake holes (F101, F103 and F148) within the pit F74, two in the southwestern corner and one in the northern end. The stakeholes were between 0.06m and 0.10m in diameter and were 0.10m deep. The southern stake holes were orientated towards the north and may have supported some form of super-structure of which the northern stake hole F148 was probably also a part. The stake holes had sandy fills with charcoal inclusions (F102, F104 and F149). The pit F74 had two fills (Fig. 6; Pl. 12). The lower fill F107 was orange brown silty sand with regular flecks of charcoal and inclusions of small sub-angular pebbles. The upper fill F73 was grey brown silty sand with occasional inclusions of charcoal, which was similar to the fill of F88. A small sherd of coarse ware pottery (E2126:3) was recovered from the upper fill of F74 (Appendix 3).

There were four oval pits on the west of the site. The largest of these F76 was 3m west of F74 and the other three F24, F201 and F207 were located to its northwest. These pits ranged in size from 0.46m by 0.35m (F24) to 0.62m by 0.84m (F76) (Pl. 13). They all had u-shaped profiles and were between 0.15m and 0.30m deep. The fills of the pits varied from silty sand F75 and F23 to sandy clay with varying amounts of charcoal flecks F206 and F200 (Pls. 14 and 15).

3.3.8 *Rubbish pit F84*

There was a small (0.60m by 0.68m) rubbish pit F84 on the south of the central area. It was 0.19m deep with an uneven base. The sides of the pit had a sharp break of slope at the south and a gentle break of slope at the north. There were two stake holes (F152, F154) at the southern end of the pit. These were 0.05m in width and between 0.04m and 0.07m deep. The pit was filled with loosely compacted mid-brown silty sand with patches of burnt clay and flecks of charcoal F83 (Pl. 16) and the fills of the stake holes F153 and F155 were similar. Five sherds of coarse ware pottery (E2126:5-11) were recovered from F83 (Appendix 3).

3.3.9 Post rows

There were three rows of post holes within the southern end of Possible Structure 1. One between the rubbish pit F84 and the storage pit F74 and two between that pit and another storage pit (F62). The western row (F114, F129, F92, F90, F99, F109, F203, F213) was aligned north-south and the other two rows (F168, F178, F69, F182, F64, F184, F22, F124) and (F166, F170, F70, F68, F186, F194) were aligned northeast-southwest. The north-south row was 2m long and the other rows were 1.50m in length. The post holes were set in staggered rows and this layout suggests that they may have supported wattling (Fig. 6). It is unlikely that these features formed part of an external wall of Possible Structure 1 and they may have been part of a screen or some other internal furniture. The post holes ranged from 0.06m to 0.14m in width (Tables 4- 6) and were set an average of 0.15m apart. The north-south row extended for 2m and the northeast-southwest rows were *c.*1.50m and *c.* 0.90m long respectively. These post rows could have joined to form part of the same structure and may have served as a rack which could have been used for drying cloth or meat (Fig. 6). Charred wood from the fill of one of the post holes F171 was identified as oak, cherry, pomaceous fruitwood, hazel and ash, but the charcoal level was low (Appendix 7). A sherd of coarse ware pottery (E2126: 17) was recovered from F212 the fill of post hole F213 (Appendix 3).

Table 4 Details of posts forming the north-south post row

Feature No.	diameter /length x width	depth	orientation	shape in plan	profile	base	fill
F114	0.18m x 0.14m	0.13m	vertical	sub-circular	u-shaped	concave	F113 silty clay with regular or frequent flecks of charcoal
F129	0.06m	0.05m	slightly north	circular	u-shaped	concave	F130 silty clay with regular or frequent flecks of charcoal
F92	0.08m x 0.07m	0.04m	vertical	sub-circular	v-shaped	pointed	F91 silty clay with regular or frequent flecks of charcoal
F90	0.07m x 0.05m	0.08m	vertical	sub-circular	u-shaped	concave	F89 silty clay with regular or frequent flecks of charcoal
F99	0.08m x 0.06m	0.13m	Slightly eastward	oval	v-shaped	pointed	F100 silty clay with regular or frequent flecks of charcoal
F109	0.09m	0.09m	vertical	circular	u-shaped	concave	F110 silty clay with regular or frequent flecks of charcoal
F213	0.10m x 0.09	0.14m	vertical	circular	u-shaped	concave	F212 silty clay with regular or frequent flecks of charcoal

Table 5 Details of posts forming the northeast-southwest post row

Feature No.	diameter /length x width	depth	orientation	shape in plan	profile	base	fill
F168	0.12m x 0.13m	0.15m	vertical	circular	u-shaped	concave	F169 silty clay with regular or frequent flecks of charcoal
F178	0.12m x 0.11m	0.06m	vertical	circular	u-shaped	concave	F179 mid-brown silty sand with very occasional charcoal
F182	0.12m x 0.11m	0.21m	south-west	circular	u-shaped	concave	F183 mid-brown silty sand with very occasional charcoal
F64	0.13m x 0.12m	0.16m	southwest	circular	u-shaped	concave	F63 mid-brown silty sand with very occasional charcoal
F184	0.19m x 0.11m	0.26m	vertical	sub-circular	u-shaped	concave	F185 mid-brown silty sand with charcoal inclusions
F22	0.08m x 0.65m	0.09m	vertical	sub-circular	u-shaped	flat	F21 mid-brown silty sand with very occasional charcoal
F124	0.11m x 0.08m	0.09m	vertical	oval	u-shaped	concave	F123 silty clay with regular or frequent flecks of charcoal

Table 6 Details of posts forming the northeast-southwest post row

Feature No.	diameter /length x width	depth	orientation	shape in plan	profile	base	fill
F166	0.11m x 0.07m	0.08m	vertical	sub-circular	v-shaped	pointed	F167 mid-brown silty sand with very occasional charcoal
F170	0.12m x 0.09m	0.12m	vertical	sub-circular	u-shaped	concave	F171 silty clay with regular or frequent flecks of charcoal
F70	0.10m x 0.08m	0.15m	west	circular	u-shaped	concave	F69 silty clay with regular or frequent flecks of charcoal
F68	0.14m x 0.10m	0.08m	vertical	sub-circular	u-shaped	concave	F67 mid-brown silty sand with very occasional charcoal
F186	0.10m	0.10m	vertical	circular	u-shaped	concave	F187 mid-brown silty sand with very occasional charcoal
F194	0.09m x 0.08m	0.06m	vertical	circular	u-shaped	concave	F195 mid-brown silty sand with very occasional charcoal
F190	0.08m x 0.07m	0.08m	west	circular	u-shaped	concave	F191 mid-brown silty sand with very occasional charcoal

3.3.10 Repair

Two postholes were had been cut into two of the pits probably represent repair to Possible Structure 1. A large posthole F211 (Table 7) cut the northern end of the storage pit F62. The other post hole F180 cut the eastern end of the cooking pit F82 (Pl. 9). The post within posthole F180 could have been erected in order to repair or strengthen the external wall of Possible Structure 1 while F211 would have been an internal post (Fig. 6).

Table 7 Dimensions of post holes associated with repair to Possible Structure 1

Feature No.	diameter /length x width	depth	orientation	shape in plan	profile	base	fill
F211	0.41m x 0.23m	0.40m	vertical	oval	U-shaped	concave	F210 dark grey brown sandy clay with occasional inclusions of charcoal
F180	0.23m x 0.20m	0.22m	northwest	Sub-circular	U-shaped	concave	F181 mid-grey sandy clay with fire-craked stone and charcoal

3.3.11 External features

A number of pits and a hearth were located outside the cluster of features on the central area of the site and would have been external to Possible Structure 1 (Fig. 6). They were all cut into natural subsoil F2 and since they did not fit into a stratigraphic sequence their dating is based on ceramic finds recovered during excavation. Sherds of coarse ware pottery indicate that they date to the Late Bronze Age. Several of the features did not produce any finds but their proximity to Possible Structure 1 indicates that they were almost certainly contemporary with its occupation. The presence of these features is a further indication of domestic activity on the site during the Late Bronze Age.

Pits

Five pits F157, F125, F52, F127, F54, and F34 were slightly removed from the main cluster of features on the central area of the site (Fig. 6). The pits appear to have been used for cooking (F157, F125, F127 and F52), storage (F54) and refuse disposal (F34). Finds from these features indicate that they were contemporary with the occupation of Possible Structure 1.

The cooking pit F157 was 3.50m northeast of the cooking pits F80 and F82. It was circular in plan and measured 0.63m in diameter and 0.10m in depth. It was filled with dark grey brown sandy clay with regular inclusions of charcoal and small (0.02m – 0.07m) fire-cracked stone (Pl. 17). Three other cooking pits F52, F125 and F127 were located on the eastern part of the site 7.50m southeast of Possible Structure 1. These were smaller in size to cooking pit F157 and ranged from 0.26m to 0.32m in diameter. They were between 0.24m and 0.27m in depth and all had u-shaped profiles. The pits F52 and F125 had straight sides and flat bases while F127 had steeply sloping sides and a concave base. There were three fills F131, F132 and F51 within F52 (Pl. 18). The lower fill F131 was mid-brown silty clay with inclusions of sub-angular stones (0.02m to 0.11m in size). The middle fill F132 was dark brown sandy silt with frequent inclusions of charcoal and regular stone (0.02m – 0.04m) inclusions. The upper fill F51 was mid-brown sandy silt with occasional flecks of charcoal and heat affected stone (0.04m in size). The other two pits were filled by F126 and F128 both of which comprised dark brown sandy silt with frequent inclusions of fire-heated stone (0.02m -0.08m) and occasional flecks of charcoal. Coarse ware pottery (E2126:16) recovered from the fill F126 indicates that these pits date to the Late Bronze Age (Appendix 10).

A shallow (0.07m) storage pit F54 was located 6m to the east of the central cluster of features and 2.40m from the cooking pit F157. It was oval (0.51m by 0.41m) in plan and had a u-shaped profile. The pit was filled by moderately compacted mid-brown silty sand with very occasional flecks of charcoal F53.

A rubbish pit F34 was located 5m south of the central cluster of features (Fig. 6). It was oval (0.89m by 0.70m) in plan and had a u-shaped profile. It was 0.32m in depth and was filled by orange brown silty clay F40, which was sealed by loosely compacted mid-brown sandy clay with regular inclusions of charcoal F33.

Hearth and pit

A hearth F281 and a pit F233 were located at the centre of the northern end of the site, approximately 8m from the central cluster of features that defined Possible Structure 1 (Fig.6).

The truncated remains of a hearth F281 comprised a sub-rectangular (1.36m by 1.02m) area of scorched earth. An oval pit F233 was located 1.30m to the west of the

hearth F281. It measured 0.56m by 0.38m and was 0.10m in depth. It had a large stone protruding from its base and there was a post hole (F248 and F266) at either end of the pit. The postholes were 0.11m by 0.13m and 0.09m in diameter respectively. They were 0.07m in depth and were filled by loosely compacted mid-brown sandy silt with frequent inclusions of decayed limestone, which was identical to the fill of the pit F232. Since the postholes and the pit had the same fill it is likely that they went out of use at the same time. The pit was probably used in association with the hearth F281, although its exact function remains uncertain.

Western area

Further settlement activity was represented by two external hearths and the remains of a possible structure (Possible Structure 2) on the northwestern end of the site. In the absence of a stratigraphic sequence on this part of the site the dating of these features is based on the ceramic finds recovered from them. The pottery was identified as coarse ware. This indicates that the features were in use during the Late Bronze Age and as such they were probably more or less contemporary with the occupation of Possible Structure 1.

External hearths

There were two unenclosed hearths F133 and F137 on the northwest end of the site (Fig. 7). The smaller of the two F133 measured 0.60m by 0.75m. It comprised fire-reddened silty sand with occasional flecks of charcoal. The other hearth F137 was located 6m to the northwest. It was contained within a pit F142 measuring 0.75m by 0.70m and 0.15m deep.

Possible structure 2

Two sub-rectilinear pits F244 and F217 and a post hole F197 may represent the remains of a structure (Possible Structure 2) at the southwestern limit of excavation. This structure was 9.60m to the south of the hearth F133 and further remains may have extended beyond the area of excavation. The pits and post holes formed an arc and they may be the remains of a sub-circular structure. The pits were set 3.60m apart. The northern pit F244 was 0.90m by 0.30m. The other pit F217 was 0.90m by 0.56m and had steeply sloping sides and a concave base. The pits were 0.12m deep and were filled by mid-brown silty sand with regular charcoal inclusions F245 and F216. A sherd of coarse ware pottery (E2126:17) was recovered from one of the fills (Appendix 3). A truncated posthole F197 was located 1.60m to the southwest of the

foundation pits. It was 0.38m in diameter and 0.07m in depth, with a u-shaped profile. The posthole was filled by loosely compact grey black silty sand with inclusions of stone F196.

Northern Area

There was a series of five pits F50, F44, F46, F223, F225 on the northern end of the site, 13m northeast of Possible structure 2 (Fig. 4). There was no stratigraphic sequence on this part of the site and no finds were recovered from these pits. However, their relative proximity to Possible Structures 1 and 2 indicates that they are more than likely Late Bronze Age in date.

Pits

The pits did not appear to have had a structural function. There was no evidence for burning within them and no pottery was recovered from them indicating that they were unlikely to have been used either for cooking or for disposal of refuse. It is likely that these pits were used for the storage of organic material. The largest of the pits F46 was oval in plan measuring 0.93m by 0.63m. A smaller (0.34m by 0.26m) sub-circular pit F48 was located 2.90m to the east and there were two similarly sized sub-circular pits F44 and F50 set 3.50m to its north. These pits all had u-shaped profiles and were between 0.14m and 0.19m in depth (Fig. 8). They had similar fills of mid- to dark brown sandy silt with regular flecks of charcoal F45, F47, F136, F43 and F49. There were two inter-cutting pits F223 and F225 located 3m to the south of F48. The northern pit F223 was oval in plan measuring 0.58m by 0.28m. The southern pit F225 was also oval in plan and measured 0.32m by 0.57m. The pits were 0.14m deep and were both filled by dark brown sandy clay with occasional inclusions of charcoal and pebbles (6mm – 0.02m in size) F222 and F224.

Northeastern Area

There was a cluster of seventeen post holes and three stake holes on the northeastern end of the site 18m to the northeast of Possible Structure 1 and 12m to the east of the northern pit cluster F50, F44, F46, F223 and F225 (Fig. 4). Several of the postholes at this location formed a row and many of the others may have been part of the same structure although the overall layout of postholes did not form a coherent ground plan. Despite this however, it is likely that they were part of a structure (Possible Structure 3) or an area of settlement activity which extended beyond the northern

limit of excavation (Fig. 6). A large pit to the south of the structural features was almost certainly the result of associated activity. There were no finds from these features, but their proximity to the cooking pits and Possible Structure 1 which produced coarse ware pottery suggests that they also date to the Late Bronze Age. Furthermore Late Bronze Age dates were obtained for the cremation burials excavated on Site 203.4 just 20m to the northwest.

Possible Structure 3

The remains of the western wall of Possible Structure 3 are represented by a row of six postholes F262, F264, F260, F258, F270 and F272. These extended for 2.30m north-south. Most of the ten other postholes and the three stake holes (F251, F252 and F277) were clustered in an area to the southeast of this post row. Eight of the post holes (F253, F277, F255, F244, F249, F246, F279 and F278) were arranged in a roughly northeast-southwest orientation. These extended for approximately 2m and could be the remains of the southern wall of the same structure (Possible Structure 3). Two more postholes (F229 and F234) were located 6.60m to the east of this cluster (Fig. 6).

The post holes ranged from 0.18m to 0.40m in width and were up to 0.50m deep (Table 8). The stake holes were just 0.08m in diameter and were between 0.06m and 0.21m deep.

Table 8 Details of postholes forming Possible Structure 3 on the northeast end of the site

Feature No.	Diameter/length x width mm	Depth mm	Orientation	Shape in plan	Sides	Base	Fill
F262	0.18m x 0.08m	0.16m	vertical	oval	straight	concave	F263 dark orange brown silty clay with occasional charcoal flecks
F264	0.35m x 0.08m	0.16m	vertical	oval	sloping	concave	F265 dark grey brown silty clay with occasional charcoal inclusions
F260	0.17 x 0.11m	0.10m	vertical	sub-circular	straight	concave	F261 dark orange brown silty clay with occasional charcoal flecks
F258	0.40m x 0.20m	0.14m	vertical	oval	straight	concave	F259 dark grey brown silty clay with occasional charcoal inclusions
F270	0.12m	0.21m	vertical	circular	straight	pointed	F269 dark grey brown silty clay with frequent charcoal inclusions

F272	0.13m x 0.11m	0.20m	vertical	circular	straight	concave	F271 dark grey brown silty clay with occasional charcoal inclusions
F274	0.17m x 0.12m	0.26m	vertical	circular	Straight	concave	F273 dark orange brown silty clay with occasional charcoal flecks
F253	0.23m x 0.20m	0.50m	vertical	oval	Straight	concave	F254 dark grey brown silty clay with occasional charcoal inclusions
F277	0.09m	0.21m	vertical	circular	Straight	pointed	F257 dark grey brown silty clay with occasional charcoal inclusions
F255	0.12m	0.26m	vertical	circular	straight	pointed	F256 dark grey brown silty clay with occasional charcoal inclusions
F242	0.21m x 0.20m	0.38m	vertical	circular	straight	concave	F243 dark grey brown silty clay with occasional charcoal inclusions
F249	0.30m x 0.22m	0.05m	vertical	oval	straight	concave	F250 dark grey brown silty clay with occasional charcoal inclusions
F246	0.20m x 0.19m	0.20m	vertical	circular	straight	concave	F247 dark grey brown silty clay with occasional charcoal inclusions
F278	0.10m x 0.20m	0.17m	vertical	oval	straight	concave	F251 dark grey brown silty clay with occasional charcoal inclusions
F279	0.12m	0.10m	vertical	circular	straight	concave	F282 dark grey brown silty clay with occasional charcoal inclusions

Pits

There was a large (1.60m by 1.40m) pit F236 located 1.70m to the south of the post row. The pit was oval in plan with sloping sides and a flat base. It was 0.22m deep and was filled by mid- to dark brown sandy clay F237 (Pl. 19). Inclusions of charcoal and sub-angular heat-affected stones within the fill, suggest that the pit may have been used for cooking. However, the absence of scorched earth at the base of the pit makes it more likely that it was used as a container for fire debris.

3.4 *Phase 3*

3.4.1 *Pit*

A shallow (0.06m) pit F240 cut one of the postholes F274 which formed part of Possible Structure 3. This pit was circular in plan measuring 0.33m in diameter. It had a u-shaped profile and was filled by compact brown black silty clay which had a high frequency of charcoal inclusions and several stones F241. It is possible that this pit may have been dug in order to remove the post held within the post hole F274.

3.4.2 *Ditches of undetermined date*

Two ditches F227 and F20 were excavated on the eastern end of the site (Fig. 4). There were no finds from these features and consequently they cannot be dated. However, they do not appear to enclose the Bronze Age features on this site. They are almost certainly later in date and may represent agricultural use of the land.

There was a northeast-southwest orientated linear ditch F227 on the northeast end of the site. It was exposed for a length of 5.30m but extended beyond the northern limit of excavation and had been truncated to the south. It was 0.82m in width and had a u-shaped profile. There were two fills F226 and F268 within the ditch, which was 0.40m in depth. The lower fill F226 was mid-brown silty clay with occasional flecks of charcoal and regular pebbles (0.03m by 0.04m). The upper fill F268 was moderately compacted dark brown sandy silt with frequent inclusions of charcoal.

There was another ditch F20 on the south end of the site. It was orientated north-south and was traced for a length of 9.00m. It measured 0.70m in width and 0.14m in depth. It had a u-shaped profile and was filled by mid-brown sandy clay F19, which did not yield any datable finds.

3.5 *Finds*

The excavation of this site led to the recovery of pottery, lithics and stone artefacts. Two unutilised tertiary flint flakes (E2126: 1 and E2126: 2) were the only finds recovered from Phase 1 (Middle Bronze Age) features. In all ten sherds of pottery were recovered from Phase 2 (Late Bronze Age) features. These were identified as coarse ware and they represent at least three domestic vessels (Appendix 3). One of which (Vessel 1) had a bevelled rim and a biconical profile. There are many comparable examples of this type of pot on other Late Bronze Age sites, for example, at Lough Gur Site C (Ó Ríordáin 1954, fig. 16) and at Ballylegan (Site 207.2) and Ballydrehid (Site 185.5) Co. Tipperary, on the N8 scheme (Grogan and Roche 2007a, b in McQuade 2007c,d see fig. 1; Grogan and Roche 2007a). One of the other vessels (Vessel 3) was an unusually thin walled piece, but fine vessels like this are a feature of some assemblages, most notably that from Rathgall, Co. Wicklow (Raftery 1976; 1993). Along with the pottery, a spindle whorl (E2126: 15, Fig. 11, Pl. 28) was a further indicator that domestic activity had been carried out on the

site. A sherd of North Devon Gravel tempered ware (E2126:18) was recovered during site clearance. This pottery dates from the 17th century and since it did not come from a feature, it was probably derived from farmyard manure spread on the land.

3.6 *Discussion*

Excavations on this site have produced evidence for structural remains and settlement activity spanning at least two phases of prehistory (the Middle and Late Bronze Age). The earliest phase was dated by means of radiocarbon analysis to the Middle Bronze Age (1734- 1530 cal BC) (UB-7205). At this time domestic activity was being carried out on the southern end of the site. Here three hearths and a series of post holes and pits represent two areas of activity separated by approximately 10m.

There was no evidence that either of the hearths or associated pits were enclosed within a structure. It is probable therefore that these two clusters of features represent unenclosed areas of occupation. A series of postholes encircling the northeastern hearth F32 are most likely the remains of a drying rack or a fire screen used in association with it.

The three hearths were almost certainly used for domestic purposes, since there was no evidence for any industrial waste such as metal slag or ceramic wasters associated with them. Small fragments of animal bone within the hearth fills also suggest that the fires were lit for domestic use. Charcoal analysis has shown that wood from oak, elm, hazel, cherry and pomaceous fruitwood was used as fuel in two of hearths (F4 and F8). These species were probably available locally and it is likely that a primarily dryland environment pertained at Kilemly. The woodland was characterized by large canopy trees such as oak, ash and elm, and there was probably an understorey of hazel. Interestingly, there were low charcoal levels from all of the hearths sampled from this site. There are a variety of reasons why hearth deposits may not be rich in charcoal. These include the fire having been cleaned out after the last burning or the fire burning at a high temperature which could reduce the wood to ash instead of charcoal. For example, less dense woods such as hazel and willow will turn to ash more quickly than oak heartwood.

There were four pits F12, F16, F18 and F5 of varying size scattered around the western hearth F7. These were up to 0.23m deep. There was no evidence that the pits had been

used for cooking and since there were no inclusions within their fills it is unlikely that they contained domestic refuse. The balance of evidence would suggest that they were used for storage purposes. Although the tertiary flint flakes (E2126:1 and E2126:2) recovered from the storage pit F10 had not been utilised, their presence does point to domestic activity on site. These were the only artefacts recovered from Phase 1 features. They were incomplete and had been burnt and therefore they probably represent waste. The flint was most likely sourced locally from glacial drift material (Appendix 4), but in the absence of any debitage there was no indication that it was knapped on site.

The plant remains from the Middle Bronze Age contexts comprised barley grains and weed seeds. Since no chaff was recovered, there was no evidence of crop processing or storage on site and this suggests that the barley may already have been cleaned when it was brought to the site. The high incidence of weed seeds recovered with the grains may indicate that agriculture was practiced in the area (Monk 2000). The knotweeds and fat-hen seeds all exhibit signs of expansion caused by exposure to heat (Wilson 1984) which suggests the sample was the remnants of domestic activities (Appendix 8). Thus it is likely that the Middle Bronze Age occupants of the site were engaged in crop husbandry or that they were in contact with another group who grew crops somewhere in the locality. The animal bone pieces recovered during excavation were too fragmented to determine what species or anatomical elements were represented and thus there is no information on the meat diet or animal husbandry practices of the occupants.

The features excavated on this site were probably part of a larger area of occupation. It is highly likely that structural remains and/or further domestic features dating from the Middle Bronze Age may have been located outside the area of excavation. A large body of evidence dating to the Middle Bronze Age was uncovered in the wider area during excavations along the N8 scheme (Fig. 1). These discoveries have added much to the archaeological record for this area during the Middle Bronze Age and indicate that the landscape surrounding the road-take was probably also settled at this time. Three clearly defined structures and a series of fences and other associated features were excavated at Site 125.4, which was just 1.8km to the northwest of Site 203.3 in Cloughabreedy (E2274; Moriarty 2007d) (Figs. 1 and 2). The dates of two of the structures overlap with those obtained for Phase 1 activity on this site but the third structure was somewhat later. Given the proximity of these two sites it is likely that they may have been used by the same group of people. A post built structure at Site 129.1, which was approximately

2.3km to the northwest in Knockgraffon, immediately post-dated the remains on Site 203.3 (E2271; Moriarty 2007e). In addition to these sites, several Middle Bronze Age structures were excavated along the road corridor to the south of the river Suir. Two structures at Site 185.5 in Ballydrehid were at least a hundred years later than the occupation at Site 203.3, which lay 2.8km to the east (E2267; McQuade 2007d) (Fig. 1). Another two structures were excavated at Site 92.3 in Clonmore North, c.5.5km to the southwest of the site under discussion (E2294; Fig. 1). The dates obtained for that site were contemporary with those recorded for Site 203.3 (E2294; Molloy 2007a). In addition to these aforementioned sites several other sites revealed evidence for occupation features which were not associated with any structural remains. These include Site 207.2 in Ballylegan just 1.5km to the southeast of the site under discussion (E2265; McQuade 2007c), Site 147.1 in Marlhill which was 5.5km to the northwest (E2269; Moriarty 2007a) and Site 169A2 in Shanballyduff, 9.8km to the northwest (E2275; Doody 2007b). All three of these sites were close in date to Site 203.3. Further evidence for Middle Bronze Age activity uncovered along the N8 scheme comprised of burnt mounds and burials. Burnt mounds were uncovered 4.1km and 4.9km to the southwest at Sites 99.4 and 99.3 (E2296; E2295 Molloy 2007b, c). Cremation burials were excavated to the northwest of Site 203.3 at Marlhill (E2269; Moriarty 2007a) and at Shanballyduff 2 (E2297; Molloy 2007d) which were c. 5.5km and c. 10.50km away respectively (Fig. 1).

The second phase of activity on this site was dated to the Late Bronze Age (1256-1012 cal BC) (UB-7206). It was characterised by the remains of three possible structures and a scattering of pits and hearths which represent domestic activity across much of the site.

Possible Structure 1 was represented by a series of post holes and pits on the centre of the site. Although the layout of these features did not form a clearly defined foundation, their overall arrangement suggests that this structure may have been sub-circular in plan. Interestingly, the features were laid out within an area measuring approximately 6m by 6m, which is typical of the size of Bronze Age houses (Doody 2000; Carlin 2006). Furthermore structures of this period tended to be round or sub-circular in plan (Doody 2000, 139; Carlin 2006). The arrangement of structural features suggests that Possible Structure 1 may have had a northwest-facing entrance. Bronze Age structures with entrances facing this direction are not commonly recorded, but they are not unknown (Carlin 2006).

There was a central hearth F85 and several pits within Possible Structure 1. A distinct cluster of stakes around the central hearth probably represents the remains of drying racks or other hearth furniture. Analysis of the fill of one of the post holes indicates that the post had not burnt *in situ*. A variety of species was identified and the charcoal was probably derived from material blown in from burning on site. There were a series of pits within the structure. These were variously used for cooking, storage and refuse disposal purposes. Three post rows to the south of the hearth may have supported wattle screens. The posts forming these rows could have served as drying racks or been part of some internal furniture. Two other postholes were cut into features associated with Possible Structure 1 and they were probably dug in order to contain posts erected in an attempt to repair the structure.

A good parallel for Possible Structure 1 is Hut 1 which was excavated at Curraghtoor, some 13km southwest of the town of Cahir. Hut 1 was a post built structure measuring 6.50m in diameter and dating to the Late Bronze Age (Doody 2007a). A series of charcoal filled pits, some of which were quite large, were located around the perimeter of the hut. While the excavator was confident that the pits at the Curraghtoor site were not structural he conceded that their function was unclear (Doody 1987, 37). They may be comparable to the cooking pits in the central area of the Site 203.3. Comparisons may also be drawn with the Middle Bronze Age circular structure associated with several charcoal filled pits which was excavated at Site 125.1 in Cloughabreedy (E2273; Moriarty 2007b). That structure was located just 1.50km to the northwest of this site and was similar in size to Possible Structure 1, measuring 6.50m in diameter. The structure was earlier in date than Possible Structure 1 but there was also evidence for Late Bronze Age activity on the site (1140-920 cal BC) (Beta-220332), which was roughly contemporary with the occupation of Possible Structure 1.

A charcoal sample was examined from the fill F171 of one of the postholes (F170) associated with Possible Structure 1 in order to ascertain what type of wood was used in its construction. Five wood types were identified in this sample, which suggests that the charcoal was derived from on site burning rather than representing the remains of a post.

Similar tree species were identified in samples analysed from the Middle and Late Bronze Age material. The identifications suggest that oak and hazel woodland could have been growing nearby to the site. Elm could have been part of this woodland. The presence of

cherry, blackthorn and the pomaceous fruitwood type (which includes apple (*Malus sylvestris*), pear (*Pyrus pyrastrer*), hawthorn (*Crataegus monogyna*), rowan (*Sorbus aucuparia*) and whitebeam (*Sorbus aria*) indicate that closed canopy woodlands did not prevail, as these trees prefer light to grow. Possible crab apple seeds were identified from this site (Halwas 2007), and it is likely that charcoal of the pomaceous fruitwood type may represent this species. The overall impression from the charcoal, however, is that of a primarily dryland area with larger canopy trees of oak, ash and elm and a probable understorey of hazel. Smaller, scrub and shrubs such as cherry, sloe and the pomaceous fruitwood type probably also grew in the vicinity.

Several sherds of coarse ware pottery found in association with Possible Structure 1 compliment the Late Bronze Age date obtained for that structure. These pieces come from three vessels of a type typically used for domestic purposes. Together with the spindle whorl (E2126:15; Fig. 11, Pl. 28) found in one of the pits the pottery finds confirm that the structure had a domestic function. The spindle whorl suggests that textile production may have been carried out by the Late Bronze Age occupants of the site.

A hearth and several cooking pits in the area external to Possible Structure 1 probably represent domestic activity associated with the occupation of such a structure. Cooking pits and external hearths were frequently found outside structures as for example at Castleupton, Co. Antrim (Gahan 1997); Ballyvergan west, Co. Cork (O'Hara and Kehoe 2003); Townparks, Co. Antrim (Ballin Smith 2003); Tullyallen, Co. Louth (Linnane 2002), and Cloghers, Co. Kerry (Keily 2000).

The foundation remains of Possible Structure 2 were represented by an arced arrangement of slot trenches and a posthole on the western end of the site. While it is possible that further foundation remains may extend beyond the limit of excavation (Fig. 7) it is also possible that this was not a fully enclosed structure. Sherds of coarse ware pottery found in association with Possible Structure 2 confirm that it dates to the Late Bronze Age and it was probably more or less contemporary with Possible Structure 1 to its east. Two external hearths and several storage pits on this part of the site were probably used by the occupants of that structure.

Possible Structure 3 was a post-built structure that stood on the northeastern end of the site. The original ground plan of this structure could not be determined since the post holes did not form a coherent ground plan and it is possible that further structural remains extended beyond the northern limit of excavation. However, the post holes could be seen to have formed two rows (each approximately 2m long) which may represent the partial remains of the western and southern walls of a structure. A large refuse pit in proximity to these structural remains probably resulted from related settlement activity.

A small quantity of plant remains was recovered from a cooking pit associated with Possible Structure 1. These were all identified as arable weed seeds but the sample was too small to indicate whether grain was processed or stored on site during the Late Bronze Age (Appendix 8). Similarly the paucity of animal bone fragments does not allow for any interpretation of the meat diet or animal husbandry practices of the occupants at that time.

The third phase of activity on this site was represented by two ditches for which dating evidence was not available. The ditches do not appear to enclose the domestic features on this site and it is more than likely that they post-date the Bronze Age settlement, perhaps by several centuries.

This site was ideal for settlement since it lay on good land and was just 1km from the river Suir. Bronze Age settlements are usually located on well-drained thin soils, such as those on this site, which would have been suitable for arable agriculture (O'Sullivan 1998, 70). Furthermore the archaeological record shows that south-facing slopes, such as the one on which this site was located, were consistently favoured for settlement during the prehistoric period (Carlin 2006).

The structural remains on this site unfortunately do not provide sufficient evidence to determine the building technique or type of roofing likely to have been used on the structures that stood here. The lack of any clear stratigraphic sequence makes it impossible to say whether the site was continually occupied or if it was abandoned and later re-occupied. What is clear is that this site was an area of domestic settlement during the Middle and Late Bronze Age.

Other evidence for Late Bronze Age activity in the wider area was uncovered during excavations along the N8 road improvement scheme and the N24 link road (Ministerial Directive A035/000). The three cremation burials excavated at nearby Site 203.4, which

was just 20m to the west, were slightly later (1256-1012 cal BC) (UB-7206) than the Late Bronze Age settlement on this site. They demonstrate continued presence in the area during the Late Bronze Age. Contemporary settlement evidence was uncovered at several other nearby sites. Late Bronze Age structural remains were excavated at Site 206.2 (E2128; McQuade 2007b) as well as at Sites 207.1 and 207.2 (E2265; McQuade 2007c), which were located 950m and 1.5km to the southeast respectively (Fig. 2). The structures on Sites 206.2 and 207.1 were similar in size to Possible Structure 1 on this site, however the structures on those three sites were much more clearly defined than Possible Structure 1. Structural remains were also uncovered to the north of Site 203.3 on Site 137.3 (1100-830 cal BC) (Beta-220337) (E2270; Moriarty 2007c), which was and 4.5km away and at Site 173.2 which was much further (11.50km) north (E2292; Doody 2007c) (Fig. 1). The structure on Site 137.3 was similar in size to Possible Structure 1 and another point of comparison was the presence of a number of large pits associated with it (Moriarty 2007c). Notable similarities between Possible Structure 1 and the structural remains on Site 173.2 include the fact that they both enclosed a hearth while neither had a coherent structural floor plan (Doody 2007c).

Interestingly the continued presence demonstrated on this site from the Middle Bronze Age to the Late Bronze Age was noted at several other sites in the vicinity including Site 207.2 (E2265; McQuade 2007c) (Fig. 1). Further continuity was evident from Iron Age dates obtained for settlement activity at nearby Site 203.4 (190 cal BC- AD 20); (Beta 221187) see below), as well as at Site 206.4 (192-4 cal BC) (UB-7211) (E2265; McQuade 2007c) and there was evidence for Early Medieval occupation (cal AD 782-986) (UB-7207) at site 204.1 (E2127; McQuade 2007a) (Fig. 1).

4 Site 203.4

4.1 Introduction

This site was located at NGR 207063.2 126422.3. It lay on elevated ground (68.25m O.D) which commanded a good view of the surrounding area, notably the Galtee mountains to the southwest (Pl. 20).

The area of excavation measured 32m (north-south) by 27m and was located just 20m east of the Middle - Late Bronze Age settlement at Site 203.3 (Fig. 2).

The stratigraphy on site comprised up to 0.40m of topsoil overlying natural sub-soil. The sub-soil was compact yellow brown sandy silt.

All of the features were cut into the sub-soil. There was no stratigraphic sequence of features on site nor were there any chronologically diagnostic finds from the excavation. Dating is based on radiocarbon analysis which identified two phases of activity. Not all of the features have been dated and undated elements are presented below according to the phase that they are most likely to be from.

Phase 1	Late Bronze Age cremation burial pits
Phase 2	Iron Age occupation

4.2 The excavation

4.2.1 Phase 1 - Late Bronze Age

The first phase of activity on this site was represented by three cremation burials which have been dated to the Late Bronze Age (1001-821 cal BC) (UB-7512).

Cremation Burial pits F19, F16 and F74

Three cremation burial pits (F19, F16 and F74) were located on the northwest part of the site (Fig. 9). They had been truncated by earlier works on site, but there was no evidence that any of them had had surface markers or contained pottery vessels.

The northernmost cremation burial pit F19 was centrally located on the site. It was circular in plan, measuring 0.28m in diameter. It was 0.09m in depth and had a flat base. The cremated bone remains were contained within a deposit of dark-grey,

almost black silty clay which had very frequent inclusions of charcoal F20. In total there were 131.27g or 2767 fragments of bone. These were clean and bright white in colour, indicating that the bones were sorted from the pyre after a successful cremation. There were not sufficient fragments large enough to display sex characteristic traits, but the age of the individual represented was estimated on the basis of the thickness of a skull vault fragment. This indicated an age at death of between 50-89 years (Appendix 9). Charcoal from the cremation deposit was identified as oak and elm and most pieces were of oak (Appendix 7).

Cremation burial pit F16 was located 9.20m west of pit F19. It was oval in plan and measured 0.55m by 0.43m. The pit had a u-shaped profile and was 0.24m deep (Pl. 22; Fig. 10). The cremation burial deposit F15 comprised black silty clay with very high levels of charcoal, and some large fire-heated sandstone. There was a remarkably higher concentration of charcoal and cremated bone in the upper 0.08m of the pit. The cremation burial deposit comprised 11.80g or 198 fragments of bone. The bone was all very highly fragmented and unfortunately despite specialist analysis none of the fragments could be identified to either species or skeletal element. However, given the context of the deposit it is almost certainly human bone (Appendix 9). A single partially charred dock seed (*Rumex* sp.) was the only plant identified from the cremation deposit (Appendix 8).

Cremation burial pit F74 was located approximately 3.75m south of the pit F16. It was circular in plan measuring 0.38m in diameter and 0.28m in depth. It had a u-shaped profile (Fig. 10). The cremation burial was deposited within mid- to dark-brown silty sand with inclusions of small stones and charcoal F75 (Pl. 22). This burial had the highest bone content of the three at 654.54g and 9334 fragments, which represent the remains of at least one individual. The bones were white in colour and slightly sooty. Age at death was estimated to have been between 35-64 years, based on the relative thickness of the diploë and internal and external tables of the skull vault. It is likely that this individual was male, based on the developed mastoid process of the left temporal bone and the left superciliary arch of the frontal bone (Appendix 9). A sample of charcoal from this deposit was identified as hazel, oak, cherry and blackthorn/sloe. Hazel was the main species present and insect holes indicate that it was gathered as dead wood (Appendix 7). A sample of bone from this cremation burial was dated to the Late Bronze Age (1001-821 cal BC) (UB-7512) (Appendix 10).

4.2.2 Phase 2- Iron Age

As already mentioned, there was no stratigraphic link between any of the features on this site. The second phase of activity was determined from the results of radiocarbon analysis. One of a series of pits indicative of domestic activity on site was dated to the Iron Age (190BC – cal AD 20) (Beta 221187) (Appendix 10). It is highly likely that the other pits and related features are the result of contemporary domestic activity which was carried out on site several centuries after the internment of the cremation burials on the west of the site.

Cooking pits/pot boilers

Six pits across the site were filled with charcoal-rich material and fire-heated stone. There was no evidence for scorched earth at the base of these pits and they may have served as roasting pits which burnt at a low temperature or as pot boilers. Alternatively they could have been used to hold fire debris.

There were two pits F41 and F35 on the northwest corner of the site and two more pits F47 and F29 on the central part of the site (Fig. 9). The northwestern pit F41 was circular in plan measuring 0.66m in diameter and 0.19m in depth. It had a sharp break in slope at top, gradually sloping sides and an uneven base (Pl. 24). The other pit F35 was located 3m to the east. It was oval in plan measuring 0.64m by 0.50m. It had a u-shaped profile and was 0.09m deep. The two pits (F47 and F29) on the central area of the site were sub-oval in plan. The smaller of these F47 was 12m southeast of the pit F41. It was 0.59m long, 0.47m wide and 0.22m deep. It had a u-shaped profile with a sharp break in slope at top, straight sides and a rather flat base. The other pit F29 was 9.10m further south. It was 1.46m long, 0.63m wide and 0.16m deep. It had sloping sides and a flat base. There was a small (0.07m diameter) stake hole F83 in the western base of the pit. It was 0.09m in depth and was filled by mid-brown sandy silt with occasional small stones and a few flecks of charcoal F84.

Three of these pits were filled with mid- to dark-grey brown silty sand with occasional flecks of charcoal and pieces of sandstone (F42, F36 and F30). The other two pits had similar fills within which were occasional fire-heated stones (F48 and F32).

There were two more pits (F4 and F12) at the southern edge of excavation. F4 was sub-oval in plan measuring 0.60m by 0.26m. It had a u-shaped profile and was 0.10m

deep (Fig. 10). Pit F12 was a large, circular pit located 6m southeast of pit F4. It measured 0.75m in diameter and was 0.26m deep with a u-shaped profile (Fig. 10). The southern slope of the pit had a small ledge half way down and the base was rather concave. These pits were filled by brown black silty clay which had frequent inclusions of charcoal and sub-angular fire affected stones F3 and F11. Very few indeterminate cereal grains, plantain (*Plantago* sp.) seeds, mustard/cabbage (*Brassica* sp.), fragments of hazelnut shell (*Corylus avellana*), and a cherry/ hawthorn (*Prunus/Crataegus* sp.) stone were recovered from F3 (Appendix 8). The paucity of plant remains and the degree of degradation they exhibit suggests secondary or tertiary deposition in this feature. The plant remains were likely scattered on the ground surrounding the pit, eventually making their way into the fill. A possible barley (cf *Hordeum* sp.) grain was the only seed evident within F11 (Appendix 8). A sample of charcoal from F11 was sent for radiocarbon analysis and returned an Iron Age date (190BC – cal AD 20) (Beta-221187) (Appendix 10).

4.2.3 Phases 1- 2

A series of structural elements and pits represent domestic activity on site. These features have not been dated but given their domestic function, it is likely that they are contemporary with the Phase 2 Iron Age cooking pits.

Structural elements

Structural remains were represented by eighteen postholes and a single stake hole scattered across the site. The lay out of these postholes did not form a coherent ground plan (Fig. 9), but they represent the remains of some form of structure that once stood on the site.

The postholes ranged from 0.18m to 0.53m in width and were between 0.06m and 0.22m in depth (Table 1) (Fig. 10). There were seven postholes on the northern end of the site. Four of these F37, F39, F45 and F23 were aligned roughly east-west. This row of posts extended for 14m. The posts were set at irregular intervals of between 2.20m (F45 and F23) and 6m (F37 and F39) apart. Another posthole F49 was just 0.80m southwest of the western post F23. The other two post holes F68 and F57 were 8m northeast of F23 and were set 5m apart.

There were five postholes on the central part of the site (F72, F61, F64, F53, and F51). The post hole F72 was 7.50m south of the second post F39 in the northern post row and the postholes F61 and F64 were set 15m to its southeast. A row of three postholes F85, F71 and F8 orientated northwest - southeast was set 3.50m south of F72. These post holes were set 5m and 8m apart respectively (Pl. 23). Two other post holes F53 and F51 were set 6m north of this post row. There was a single posthole F14 on the southern end of the site 6m south of the post row F85, F71 and F8. There was stone packing within F14 and scorched earth on the southern edges of the posthole indicates that the post within it had burnt *in situ*.

Table 1 Details of Post and stake holes

Feature No.	Diameter/length x width	Depth m	Orientation	Shape in plan	Sides	Base	Fill
F37	0.46m x 0.33m	0.06m	Vertical	Oval	Straight	Concave	F38 mid-brown silty sand with inclusions of charcoal
F39	0.23m x 0.21m	0.09m	Vertical	Circular	Straight	Tapered	F40 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F45	0.45m x 0.40m	0.01m	Vertical	Oval	Straight	Concave	F46 mid-brown silty sand with inclusions of charcoal
F23	0.38m	0.30m	Vertical	Circular	Straight	Flat	F24 mid-brown silty sand with inclusions of charcoal
F49	0.33m x 0.27m	0.14m	Vertical	Circular	Straight	Flat	F50 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F68	0.45m x 0.27m	0.19m	Vertical	Oval	Sloping	Tapered	F69 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F57	0.26m x 0.21m	0.20m	Vertical	Oval	Straight	Tapered	F58 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F72	0.26m x 0.25m	0.06m	Vertical	Circular	Sloping	Tapered	F73 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F61	0.18m x 0.02m	0.22m	Vertical	Circular	Straight	Concave	F62 mid-brown silty sand with inclusions of charcoal
F64	0.33m x 0.22m	0.11m	Vertical	Oval	Straight	Flat	F63 mid-brown silty sand with inclusions of charcoal
F51	0.30m	0.09m	Vertical	Circular	Straight	Concave	F52 brown grey sandy clay with occasional charcoal flecks and large, angular stones

F53	374 x 355	0.06m	Vertical	Circular	Straight	Concave	F54 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F79	0.06m	0.14m	40° SW	Circular	Straight	Concave	F80 dark-grey sandy silt with frequent inclusions of charcoal
F85	0.42m x 0.19m	0.29m	Vertical	Oval	Straight	Tapered	F86 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F71	0.39m x 0.15m	0.10m	Vertical	Circular	Straight	Concave	F70 brown grey sandy clay with occasional charcoal flecks and large, angular stones
F8	0.53m x 0.40	0.12m	Vertical	Sub-circular	Straight	Concave	F7 mid-brown silty sand with inclusions of charcoal
F14	0.18m	0.14m	Vertical	Circular	Straight	Tapered	F13 brown grey sandy clay with occasional charcoal flecks and large, angular stones

Refuse or storage pits

There were several pits scattered across the site which did not appear to have had a structural function. There was no evidence that they had been used for cooking and they were probably dug for storage purposes or to contain refuse. The absence of pottery from the fills of these pits could be seen as a dating indicator since ceramics are rarely found on Iron Age sites.

There were seven pits (F55, F31, F27, F25, F81, F65, and F59) on the central area of the site. Two of these F55 and F31 were oval in plan with average dimensions of 0.67m by 0.35m. These pits were set 0.60m apart. The northern pit F55 was 0.12m deep (Fig. 10). It had gradually sloping sides and an uneven base. Its fill was mid-orange brown silty sand with inclusions of charcoal, animal bone fragments and rounded stones F56. Charred weed seeds present in this sample were identified as fumitory (*Fumaria* sp.) and dock (*Rumex* sp.) (Appendix 8). The other pit F31 was 0.20m deep and had a sharp break in slope at top, gradually sloping sides and a tapered base, giving it a slightly v-shaped profile (Fig. 10). It was filled by mid-brown silty clay with occasional charcoal inclusions F32. A single hazel nut (*Corylus avellana*) fragment was the only plant identified from the fill of this pit (Appendix 8). The other three pits F27, F25 and F81 were located 5.80m southeast of F55. They were sub-oval in plan and varied in size from 0.36m by 0.32m (F25) to 0.90m by 0.63m (F27). These pits had u-shaped profiles and varied from 0.03m (F25) to 0.23m

(F81) in depth. Their fills comprised mid-brown grey sandy clay with inclusions of charcoal and gravel (F28, F26 and F82).

A large irregularly shaped pit F65 was located centrally on the site, approximately 1.70m south of the pit F31 and 4.50m west of F27. It measured 1.54m (north-south) by 0.86m and was between 0.07m and 0.13m deep. It had gradually sloping sides and an uneven base, which was lined with several large stones. The lower fill F67 was mid-brown silty clay. It was a maximum of 0.05m deep and was sealed by F66 dark-brown silty clay with inclusions of charcoal and rounded stones.

There were three smaller pits F59, F18 and F76 to the south of F65 (Fig. 9). The largest (F59) was located 1.10m south of the pit F65. The pit F18 was 3.50m further south and pit F76 was 6.20m to the southwest. These pits were sub-circular in plan with average dimensions of 0.62m by 0.54m. They all had u-shaped profiles and ranged from 0.12m to 0.25m in depth (Fig. 10; Pl. 25). The fill of F59 was mid-brown silty sand with inclusions of small stones and occasional specks of charcoal F60. The other pits were filled with sandy clay which had occasional inclusions of charcoal and small stones, which varied from dark-grey brown (F17) to mid-brown red (F77 and F78).

There was another pit F6 on the southern end of the site 0.40m west of the posthole F14 and 1.70m west of the cooking pit F12 (Fig. 9). It was oval in plan measuring 0.50m by 0.48m and was 0.18m deep. It had a u-shaped profile with a sharp break in slope at top, rounded sides and a concave base. The fill F5 was mid-brown sandy silty clay with occasional inclusions of charcoal flecks and stones.

Ditch F33

A northeast - southwest running ditch F33 was located on the northwest end of the site (Fig. 9). The ditch was exposed for 30.00m, but it extended beyond the northern limit of excavation (Pl. 26). It varied from 0.38m to 0.75m in width and was an average of 0.20m deep (Fig. 10). The sides varied along the length of the feature ranging from straight to sloping (Pl. 27). It could have functioned as either a drainage ditch or a field boundary. The fill was composed of mid-brown grey silty sandy clay with occasional inclusions of charcoal and small sub-rounded and angular stones F34. A flint flake (E2126:19) recovered from the fill of this ditch suggests that it dates to

the prehistoric period. The flint was a complete utilised secondary flake, which was probably used for domestic activity but was not diagnostic to a particular period of prehistory (Appendix 4).

4.3 ***Finds***

No pottery was found on this site. The only find was a complete secondary flint flake (E2126:19) from the ditch F33. Although this flint is not a precise indicator of date, it is almost certainly from the prehistoric period. The absence of ceramics from Phase 2 features is of note given the Iron Age date returned for radiocarbon analysis of the domestic features, since pottery is rarely found from sites of this period in Ireland.

4.4 ***Discussion***

The results of excavation on this site revealed evidence for two phases of occupation, each of which represented a different focus of activity. Phase 1 dated to the Late Bronze Age and was characterised by burial evidence. Phase 2 dated to the Iron Age and was represented by features indicative of domestic activity.

The earliest activity evident on this site was characterised by three cremation burial pits, which have been dated by radiocarbon analysis to the Late Bronze Age (1001-821 cal BC) (UB-7512) (Appendix 10). The burials were deposited in simple un-lined pits but had been heavily truncated prior to excavation.

The Bronze Age burial record from Ireland shows considerable variation with examples of both cremation and inhumation. There are many recorded examples of cremation burials from simple un-lined pits, similar to those on this site. Some of the other examples are isolated pits and others occur within cemetery sites (www.excavations.ie). The cremation burial pits on this site were comparable in size to those recorded from other Bronze Age sites, which generally measured 0.20-0.50m in diameter and less than 0.30m deep (Grogan *et al* forthcoming; Stevens 1997; 1998; Dunne 1998). The landscape siting of the cremation burials on Site 203.4 may be compared with that of the cremation pit cemetery at Ballyvelly, Co. Kerry which was also on the southern slopes of a hill with good views of the surroundings (Dunne 1998). Similarly, the cremation cemetery at Killoran 10, Co. Tipperary was sited on a low plateau (Stevens 1998).

Modern data indicates that the cremated remains of a complete adult range in weight from approximately 1600g to 3500g (McKinley 1989)¹. Although much smaller in quantity the bone recovered from the three cremation burial pits on this site represent the remains of at least two and quite probably three individuals. Very small quantities of bone (under 200g) were recovered from the cremation burial pits F16 and F19, both of which had been heavily truncated and consequently little analysis could be undertaken on these remains. The larger quantity of bone recovered from burial pit F74 allowed for fuller analysis of the interred bone pieces. Age data was available on the remains from two of the burials and both were of mature individuals over 35 years. Although limited, the information from this site is consistent with that recorded for other Bronze Age cremation burials. For example analysis of the cremation burials excavated along the gas pipeline to the west found that the deposition of the cremated remains of a single body, as opposed to multiple individuals, was the norm in the Middle to Late Bronze Age. In the majority of instances on sites from those periods the interred remains were those of adults (Grogan *et al* forthcoming).

Charcoal analysis of the cremation deposits at Kilemly indicates that oak, hazel, elm, cherry and blackthorn wood was used in the funeral pyres. This variety of trees indicates that the fuel was gathered randomly and there are no particular patterns in the selection of the material for the funeral pyre. Oak was the main fuel in the cremation burial deposit F20 while hazel was the main fuel in the cremation deposit F75. Oak is frequently recorded from the analysis of cremation deposits on Bronze Age sites and in many cases it was the preferred wood. This is probably because oak is capable of achieving the high temperatures required for a successful cremation (Grogan *et al* forthcoming).

The charred white colour of the bone indicates that it had been exposed to heat temperatures in excess of 700-800°C and the cremations were successful in all three instances. The clean condition and absence of soot on the bones in the burials suggests that they were separated from the pyre remains before being placed within their respective pits (Appendix 9). No hearths were identified on this site and although two hearths on the northwest of the adjoining Site 203.3 were probably Late Bronze Age in date, there was no evidence that these had served as funeral pyres. Consequently, the location of the funeral pyres was not determined and the possibility remains that the fires

¹ Although modern individuals may be larger than their prehistoric counterparts, the overall expected weight range is accurate

could have been lit on lands outside the road take or that the pyres burned on raised platforms which may not have left any visible trace on the ground.

The high fragmentation of the bone suggests that it had been deliberately crushed, although the uneven quantity of bone noted between the three burials makes it difficult to determine with certainty whether this was the case. The variation in bone quantity between the three cremation deposits was most probably a result of truncation. Despite the loss of bone owing to disturbance on site, skeletal elements from three out of the four body regions were identified in each of the cremation deposits F19 and F74. Thus it can be concluded that these were probably originally complete burials.

The date obtained for the burials on this site is slightly later than that for the second phase (1256-1012 cal BC) (UB-7206) of settlement activity at the nearby Site 203.3. The sites were just 20m apart and the dating evidence suggests that there was a continued presence in this area during the Late Bronze Age. Other evidence for Late Bronze Age activity in the environs was uncovered during excavations along the N24 and N8 road takes (Fig. 1). Contemporary settlement evidence was uncovered 950m to the southeast at Site 206.3 (E2128; McQuade 2007b) (Fig. 2) and 4.50km further to the north on Site 137.3 (E2270; Moriarty 2007c) and much further (11.50km) north at Site 173.2 (E2292; Doody 2007c) (Fig. 1). Settlement evidence uncovered at Site 207.2 was slightly earlier (1256- 1012 cal BC) (UB-7206) than the burials on this site (McQuade 2007c). The number of previously unrecorded sites excavated along the N24 link and N8 road takes indicates that a large part of the wider area was probably also occupied during the Late Bronze Age.

A single closely dated (1252-980 cal BC) (UB-7378) cremation burial was excavated at Site 125.5 (E2274; Moriarty 2007d) just under 2km to the northwest of Site 203.4 (Fig. 1). That was also deposited in a simple un-lined pit and the cremated bone, which totalled just 225g, represented the remains of an adult. Oak was the main wood identified within that cremation deposit, indicating that it was selected as the preferred fuel for the funeral pyre (O'Donnell in Moriarty 2007d).

A second phase of prehistoric activity on Site 203.4 was characterised by features indicative of domestic occupation.

A series of post holes on the site suggest that a structure or structures of some sort once stood here, although their layout did not form a coherent ground plan. There is no

evidence to link these features to the cremation burial pits and they are more likely associated with the various cooking pits and refuse pits on the site. Despite the absence of a recognisable floor plan, a cluster of features on the central part of the site probably represents an area of domestic activity. An Iron Age date (190BC–cal AD20) (Beta-221187) was obtained for one of the cooking pits F11 on the southern end of the site. The domestic features are probably more or less contemporary, post-dating the funerary remains by several centuries. The siting of these features on a south-facing slope is typical of that recorded for many other prehistoric settlements (www. excavations. i.e.; Carlin 2006).

The ditch F33 was located to the west of the cremation burial pits (Fig. 9). Its proximity to burial pit F74, suggests that it probably did not enclose the burial pits and it more than likely post-dates them. The flint flake (E2126:19) recovered from the fill of this ditch is almost certainly prehistoric in date. It may have been made during the Neolithic or Bronze Age, but cannot be any more precisely dated. Its presence indicates that the ditch feature dates to the middle of the prehistoric period. It is a complete tool which showed signs of use and may be described as a discarded piece. The flint on which it was made was probably sourced locally from glacial till material. No debitage was recovered on this site or on nearby Site 203.3 and therefore there is no indication that the tools found at these sites were manufactured there.

Our understanding of the site during the Iron Age is not helped by the absence of artefactual remains. However as already noted, the absence of pottery may be seen as a further indicator of date, since pottery is rarely found on Iron Age sites in Ireland. Some information can be derived from the environmental remains recovered during excavation. Indeterminate cereal grains and a possible barley grain were recovered from the fill of one of the cooking pits. These seeds may be the remains of material burnt with the fuel rather than food debris. However, their presence indicates that cereal crops were being grown in the vicinity during the Iron Age. Unfortunately the animal bone pieces recovered during excavation were too fragmented to allow for identification to species or anatomical element and consequently they do not inform on the dietary preferences or animal husbandry practises of the occupants.

This site was one of several excavated along the road scheme which returned Iron Age dates. Other evidence for Iron Age activity in the surrounding area included settlement at Sites 206.4, 207.2 (E2265; McQuade 2007c) which were 1.2km and 1.48km to the

southeast of this site respectively and at Site 185.5 (E2267; McQuade 2007d) some 2.6km to the west (Fig. 1). Structural remains were noted on two of these sites (Site 207.2 and Site 185.5). There was evidence for Iron Age burials further to the northwest at Site 133.1 (E2270; Moriarty 2007c) and Site 147.3 (E2272; Moriarty 2007f) which were 2.5km and 6.1km from Site 203.4 respectively (Fig.1). Iron Age industrial activity was evident from a charcoal smelting pit excavated at Site 189.1 (E2266; McQuade 2007e). The excavation of these sites has added valuable information to the archaeological record, because there were very few previously recorded Iron Age sites in the area. The identification of these sites further underlines the probability of other contemporary sites having been located in the wider area.

4.5 *Conclusions*

This constitutes the final report on the excavation and post excavation analysis of Sites 203.3 and 203.4 in Kilemly, Co. Tipperary which were excavated under registration number E2126. The excavation of these sites was carried out as part of the resolution of archaeological sites along the N8 road improve scheme (A035/00).

There was evidence for two phases of Bronze Age settlement on Site 203.3. The first phase dated to the Middle Bronze Age (1734 - 1530 cal BC) (UB-7205). At that time there were two unenclosed areas of domestic activity on the southern end of the site. These were characterised by three hearths and a series of post holes and pits. The second phase of occupation was characterised by the remains of three possible structures and a series of related features spread across the site. These were dated by radiocarbon analysis and ceramic finds to the Late Bronze Age.

There were also two phases of activity evident at Site 203.4. During the Late Bronze Age three cremations burials were placed in simple un-lined pits on the west end of the site. The second phase of activity was characterised by a series of structural remains of no coherent ground plan and numerous pits that seem to have been domestic in function. These features were dated to the Iron Age.

The excavation of these two sites has added much to the archaeological record for this area and further underlines the probability of other prehistoric sites having been located in the wider area.

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Appendix 1 Lists of features

Table 1 - Site 203.3

Feature No.	Phase	Description	Area
F1	N/a	Topsoil	
F2	N/a	Natural	
F3	1	Pit	south east
F4	1	Fill of F3	south east
F5	1	Pit	south east
F6	1	Fill of F5	south east
F7	1	Hearth	south east
F8	1	Fill of F7	south east
F9	1	Fill of F10	south east
F10	1	Pit	south east
F11	1	Fill of F12	south east
F12	1	Pit	south east
F13	1	Fill of F14	south east
F14	1	Posthole	south east
F15	1	Fill of F16	south east
F16	1	Pit	south east
F17	1	Fill of F18	south east
F18	1	Pit	south east
F19	3	Fill of F20	south east
F20	3	Ditch	south east
F21	2	Fill of F22	Possible Structure 1
F22	2	Posthole	Possible Structure 1
F23	2	Fill of F24	Possible Structure 1
F24	2	Pit	Possible Structure 1
F25	1	Fill of F26	south east
F26	1	Posthole	south east
F27	1	Fill of F28	south east
F28	1	Posthole	south east
F29	1	Fill of F30	south east
F30	1	Posthole	south east
F31	1	Fill of F32	south east
F32	1	Hearth pit	south east
F33	2	Fill of F34	south east
F34	2	Pit	south east
F35	1	Fill of F32	south east
F36	1	Fill of F3	south east
F37	1	Fill of F3	south east
F38	1	Lower fill of F7	south east
F39	1	Fill of F5	south east
F40	2	Fill of F34	south east
F41	1	Pit	south east
F42	1	Fill of F41	south east
F43	2	Fill of F44	north
F44	2	Pit/posthole	north
F45	2	Fill of F46	north
F46	2	Pit	north

F47	2	Fill of F48	north
F48	2	Pit	north
F49	2	Fill of F50	north
F50	2	Posthole	north
F51	2	Fill of F52	centre
F52	2	Pit	centre
F53	2	Fill of F54	centre
F54	2	Pit	centre
F55	2	Fill of F56	Possible Structure 1
F56	2	Posthole	Possible Structure 1
F57	2	Fill of F58	Possible Structure 1
F58	2	Posthole	Possible Structure 1
F59	2	Fill of F60	Possible Structure 1
F60	2	Posthole	Possible Structure 1
F61	2	Fill of F62	Possible Structure 1
F62	2	Pit	Possible Structure 1
F63	2	Fill of F64	Possible Structure 1
F64	2	Posthole	Possible Structure 1
F65	3	Fill of F66	south east
F66	3	Irregular, sublinear plough furrow	south east
F67	2	Fill of F68	Possible Structure 1
F68	2	Posthole	Possible Structure 1
F69	2	Fill of F70	Possible Structure 1
F70	2	Posthole	Possible Structure 1
F71	2	Fill of F72	Possible Structure 1
F72	2	Posthole	Possible Structure 1
F73	2	Fill of F74	Possible Structure 1
F74	2	Pit	Possible Structure 1
F75	2	Fill of F76	Possible Structure 1
F76	2	Pit	Possible Structure 1
F77	2	Fill of F78	Possible Structure 1
F78	2	Pit	Possible Structure 1
F79	2	Fill of F80	Possible Structure 1
F80	2	Pit	Possible Structure 1
F81	2	Fill of F82	Possible Structure 1
F82	2	Pit	Possible Structure 1
F83	2	Fill of F84	Possible Structure 1
F84	2	Pit	Possible Structure 1
F85	2	Hearth	Possible Structure 1
F86	2	Stake, assoc. with F85	Possible Structure 1
F87	2	Fill of F88	Possible Structure 1
F88	2	Pit	Possible Structure 1
F89	2	Fill of F90	Possible Structure 1
F90	2	Posthole	Possible Structure 1
F91	2	Fill of F92	Possible Structure 1
F92	2	Posthole	Possible Structure 1
F93	2	Fill of F94	Possible Structure 1
F94	2	Posthole	Possible Structure 1
F95	2	Fill of F96	Possible Structure 1
F96	2	Posthole	Possible Structure 1
F97	2	Fill of F82, oxidised clay	Possible Structure 1

F98	2	Base fill of F78	Possible Structure 1
F99	2	Posthole	Possible Structure 1
F100	2	Fill of F99	Possible Structure 1
F101	2	Stakehole	Possible Structure 1
F102	2	Fill of F101	Possible Structure 1
F103	2	Stakehole	Possible Structure 1
F104	2	Fill of F103	Possible Structure 1
F105	2	Posthole	Possible Structure 1
F106	2	Fill of F105	Possible Structure 1
F107	2	Lower fill of F74	Possible Structure 1
F108	2	Lower fill of F62	Possible Structure 1
F109	2	Posthole	Possible Structure 1
F110	2	Fill of F109	Possible Structure 1
F111	2	Posthole	Possible Structure 1
F112	2	Fill of F111	Possible Structure 1
F113	2	Fill of F114	Possible Structure 1
F114	2	Posthole	Possible Structure 1
F115	2	Fill of F116	Possible Structure 1
F116	2	Posthole	Possible Structure 1
F117	2	Fill of F118	Possible Structure 1
F118	2	Pit	Possible Structure 1
F119	2	Fill of F120	Possible Structure 1
F120	2	Posthole	Possible Structure 1
F121	2	Fill of F122	Possible Structure 1
F122	2	Posthole	Possible Structure 1
F123	2	Fill of F124	Possible Structure 1
F124	2	Posthole	Possible Structure 1
F125	2	Pit	centre
F126	2	Fill of F125	centre
F127	2	Pit	centre
F128	2	Fill of F127	centre
F129	2	Posthole	Possible Structure 1
F130	2	Fill of F129	Possible Structure 1
F131	2	Second Fill of F52	centre
F132	2	Lower Fill of F52	centre
F133	2	hearth	Northwest
F134	2	Stake (burnt)	Possible Structure 1
F135	2	Stake	Possible Structure 1
F136		Lower fill of ?	north
F137		Hearth deposit	Northwest
F138	2	Stake, assoc. with F85	Possible Structure 1
F139	2	Stake, assoc. with F85	Possible Structure 1
F140	2	Stake, assoc. with F85	Possible Structure 1
F141	2	Stake, assoc. with F85	Possible Structure 1
F142		cut for hearth F137	Northwest
F143	2	Stake, assoc. with F85	Possible Structure 1
F144	2	Stake, assoc. with F85	Possible Structure 1
F145	2	Stake, assoc. with F85	Possible Structure 1
F146	2	Stake, assoc. with F85	Possible Structure 1
F147	2	Stake, assoc. with F85	Possible Structure 1
F148	2	Stakehole	Possible Structure 1

F149	2	Fill of F148	Possible Structure 1
F150	2	Stake, assoc. with F82	Possible Structure 1
F151	2	Stake, assoc. with F82	Possible Structure 1
F152	2	Stakehole	Possible Structure 1
F153	2	Fill of F152	Possible Structure 1
F154	2	Stakehole	Possible Structure 1
F155	2	Fill of F154	Possible Structure 1
F156	2	Fill of F157	centre
F157	2	Pit	centre
F158	2	Fill of F159	north
F159	2	Pit	north
F160		Charred post	Possible Structure 1
F161	2	Posthole, assoc. with F85	Possible Structure 1
F162	2	Stake, assoc. with F85	Possible Structure 1
F163	2	Stake, assoc. with F85	Possible Structure 1
F164	2	Stake, assoc. with F85	Possible Structure 1
F165	2	Stake, assoc. with F85	Possible Structure 1
F166	2	Posthole	Possible Structure 1
F167	2	Fill of F166	Possible Structure 1
F168	2	Posthole	Possible Structure 1
F169	2	Fill of F168	Possible Structure 1
F170	2	Posthole	Possible Structure 1
F171	2	Fill of F170	Possible Structure 1
F172	2	Stake, assoc. with F85	Possible Structure 1
F173	2	Stake, assoc. with F85	Possible Structure 1
F174	2	Stake, assoc. with F85	Possible Structure 1
F175	2	Stake, assoc. with F85	Possible Structure 1
F176	2	Stake, assoc. with F85	Possible Structure 1
F177	2	Stake, assoc. with F85	Possible Structure 1
F178	2	Posthole	Possible Structure 1
F179	2	Fill of F178	Possible Structure 1
F180	2	Posthole	Possible Structure 1
F181	2	Fill of F180	Possible Structure 1
F182	2	Posthole	Possible Structure 1
F183	2	Fill of F182	Possible Structure 1
F184	2	Posthole	Possible Structure 1
F185	2	Fill of F184	Possible Structure 1
F186	2	Posthole	Possible Structure 1
F187	2	Fill of F186	Possible Structure 1
F188	2	Stake, assoc. with F85	Possible Structure 1
F189	2	Stake, assoc. with F85	Possible Structure 1
F190	2	Posthole	Possible Structure 1
F191	2	Fill of F190	Possible Structure 1
F192	2	Stakehole, assoc. with F85	Possible Structure 1
F193	2	Stakehole, assoc. with F85	Possible Structure 1
F194	2	Posthole	Possible Structure 1
F195	2	Fill of F194	Possible Structure 1
F196		Fill of F197	Possible Structure 2
F197		Pit	Possible Structure 2
F198	2	Stake, assoc. with F85	Possible Structure 1
F199	2	Stake, assoc. with F85	Possible Structure 1

F200	2	Fill of F201	Possible Structure 1
F201	2	Posthole	Possible Structure 1
F202	2	Stake, assoc. with F85	Possible Structure 1
F203	2	Stake, assoc. with F85	Possible Structure 1
F204	2	Fill of F205	Possible Structure 1
F205	2	Possible posthole	Possible Structure 1
F206	2	Fill of F207	Possible Structure 1
F207	2	Pit	Possible Structure 1
F208	2	Fill of F209	Possible Structure 1
F209	2	Posthole	Possible Structure 1
F210	2	Fill of F211	Possible Structure 1
F211	2	Pit	Possible Structure 1
F212	2	Fill of F213	Possible Structure 1
F213	2	Posthole	Possible Structure 1
F214	2	Fill of F215	Possible Structure 1
F215	2	Posthole	Possible Structure 1
F216		Fill of F217	Possible Structure 2
F217		Pit	Possible Structure 2
F218	2	Stake, assoc. with F82	Possible Structure 1
F219	2	Stake, assoc. with F82	Possible Structure 1
F220		non-arch	
F221		non-arch	
F222	2	Fill of F223	north
F223	2	Pit	north
F224	2	Fill of F225	north
F225	2	Pit	north
F226	2	fill of F227	northeast
F227	2	linear ditch	northeast
F228	2	fill of F229	northeast
F229	2	posthole	northeast
F230	2	posthole	Possible Structure 1
F231	2	fill of F230	Possible Structure 1
F232	2	Fill of F233	north
F233	2	Small sub-oval pit	north
F234	2	Posthole	northeast
F235	2	Fill of F234	northeast
F236	2	Large shallow pit	northeast
F237	2	Fill of F236	northeast
F238	2	fill of F239	Possible Structure 1
F239	2	Posthole	Possible Structure 1
F240	2	Small pit	Possible Structure 3
F241	2	Fill of F240	Possible Structure 3
F242	2	Posthole	Possible Structure 3
F243	2	Fill of F242	Possible Structure 3
F244	2	Pit	Possible Structure 2
F245	2	Fill of F244	Possible Structure 2
F246	2	Posthole	Possible Structure 3
F247	2	Fill of F246	Possible Structure 3
F248	2	Posthole, within F233	north
F249	2	Posthole	Possible Structure 3
F250	2	Fill of F249	Possible Structure 3

F251	2	Impression of stake	Possible Structure 3
F252	2	Impression of stake	Possible Structure 3
F253	2	Posthole	Possible Structure 3
F254	2	Fill of F253	Possible Structure 3
F255	2	Posthole	Possible Structure 3
F256	2	Fill of F255	Possible Structure 3
F257	2	Fill of F277	Possible Structure 3
F258	2	Posthole	Possible Structure 3
F259	2	Fill of F258	Possible Structure 3
F260	2	Posthole	Possible Structure 3
F261	2	Fill of F260	Possible Structure 3
F262	2	Pit	Possible Structure 3
F263	2	Fill of F262	Possible Structure 3
F264	2	Pit	Possible Structure 3
F265	2	Fill of F264	Possible Structure 3
F266	2	Stakehole within F233	north
F267	2	Fill of F266	north
F268	2	Upper fill of F227	northeast
F269	2	Fill of F270	Possible Structure 3
F270	2	Small circular feature	Possible Structure 3
F271	2	Fill of F272	Possible Structure 3
F272	2	Small circular feature	Possible Structure 3
F273	2	Fill of F274	Possible Structure 3
F274	2	Posthole, beneath F241	Possible Structure 3
F275	2	Fill of F276	Possible Structure 1
F276	2	posthole	Possible Structure 1
F277	2	Stakehole, filled by F257	Possible Structure 3
F278	2	Posthole filled by F251	Possible Structure 3
F279	2	post hole filled by F282	Possible Structure 3
F280	2	fill of F276	Possible Structure 1
F281	2	hearth	north
F282	2	fill of F279	Possible Structure 3

Table 2 - Site 203.4

Feature No.	Phase	Description
F1		Topsoil
F2		Subsoil/natural
F3	Phases 1-2	Fill of F4
F4	Phases 1-2	Pit
F5		Non-archaeological
F6		Non-archaeological
F7	Phases 1-2	Fill of F8
F8	Phases 1-2	Pit
F9	Phases 1-2	Fill of F10
F10	Phases 1-2	Pit
F11	Phases 1-2	Fill of F12
F12	Phases 1-2	Pit
F13	Phase 1	Fill of F18
F14	Phase 2	Posthole

F15	Phase 2	Fill of F16
F16	Phase 2	Posthole
F17	Phase 2	Fill of F14
F18	Phase 1	Pit
F19	Phases 1-2	Stakehole
F20	Phases 1-2	Stakehole
F21	Phases 1-2	Stakehole
F22	Phase 2	Fill of F23
F23	Phase 2	Linear feature, cutting F14

Appendix 2 - Finds Register

Finds no.	Site no.	Feature no.	Category	Description
E2126:1	203.3	F10	Flint	Burnt flint flake
E2126:2	203.3	F10	Flint	Burnt flint flake
E2126:3	203.3	F73	Pottery	Pottery crumbs
E2126:4	203.3	F77	Pottery	Prehistoric body sherd
E2126:5	203.3	F83	Pottery	Prehistoric body sherd
E2126:6	203.3	F83	Pottery	Prehistoric body sherd
E2126:7	203.3	F83	Pottery	Prehistoric body sherd
E2126:8	203.3	F83	Pottery	Prehistoric body sherd
E2126:9	203.3	F83	Pottery	Prehistoric body sherd
E2126:10	203.3	F83	Pottery	Prehistoric body sherd
E2126:11	203.3	F83	Pottery	Prehistoric body sherd
E2126:12	203.3	F108	Pottery	Prehistoric body sherd
E2126:13	203.3	F108	Pottery	Prehistoric body sherd
E2126:14	203.3	F108	Pottery	Prehistoric rim sherd
E2126:15	203.3	F117	Stone	Spindle whorl/stone disc
E2126:16	203.3	F126	Pottery	Prehistoric body sherd
E2126:17	203.3	F212	Pottery	Prehistoric body sherd
E2126:18	203.3	F1	Pottery	North Devon gravel tempered ware
E2126:19	203.4	F34	Flint	Flint flake

Appendix 3 - The prehistoric pottery assemblages

By Eoin Grogan and Helen Roche

Summary

This site produced a small assemblage of 10 sherds (plus eight fragments) from at least three late Bronze Age domestic vessels (total weigh 210g). These are from pits fills associated with settlement activity.

1 Context

1.1 The pottery came from the fills of pits and postholes associated with four possible structures in a settlement context.

2 The late Bronze Age

2.1 The pottery from Kilemly is much worn and fragmented but is consistent with material from a domestic context. Vessel 1, with a bevelled rim and a biconical profile, can be widely paralleled on late Bronze Age sites and occurs, for example, at Lough Gur Site C (Ó Ríordáin 1954, fig. 16) and at Ballylegan (Site 207.2) and Ballydrehid Co. Tipperary, on the N8 scheme (McQuade 2006a; 2006b; Grogan and Roche 2007a, see fig. 1; 2007b). Vessel 3 is unusually thin walled but these fine vessels are a feature of some assemblages, most notably that from Rathgall, Co. Wicklow (Raftery 1976; 1993).

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CATALOGUE

Where the pottery is listed in the catalogue the find numbers are in bold: *e.g.*: **14** but the accession number E2126 is omitted throughout. 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) or fabric indicates separate vessels.

Late Bronze Age

The site produced 10 sherds representing at least three domestic vessels (Nos 1–3, total weight 210g).

F108: lower fill of possible storage pit F62

Vessel 1. This is represented by a single rimsherd (**14**) from a medium-sized vessel with a rounded, pinched-out everted, rim with a deep flat to gently concave internal bevel and a gently rounded biconical profile. The hard compact brown to grey-brown fabric has a medium content of sandstone and quartzite inclusions ($\leq 3 \times 2\text{mm}$, up to $8 \times 5\text{mm}$). Neck thickness: 11mm. Weight: 15g.

Vessel 2. This is represented by a two bodysherds (**12–13**) from the lower body of a medium to large vessel with a possibly gently rounded S-shaped profile. The very smooth buff fabric has a grey-brown internal surface: the exterior was finished with a fine slurry layer. There is a high content of sandstone and quartzite inclusions ($\leq 6 \times 4\text{mm}$, up to $14 \times 8\text{mm}$). Body thickness: 11.8mm. Weight: 125g.

F83: fill of possible rubbish pit F84

Vessel 3. This is represented by part of the disc base (**5–7**) and a bodysherd (**8**, plus 3 fragments: **9–11**) from a small fine-walled vessel. The base was made as a separate slightly concave disc *c.* 6.2cm in diameter. The red-buff to buff fabric has a high content of red sandstone, dolerite and quartzite inclusions ($\leq 4 \times 3\text{mm}$, up to $5 \times 4\text{mm}$). Body thickness: 8.2mm, base: 11mm. Weight: 40g.

F212: fill of posthole

This produced a single body- or basesherd (**17**) of buff fabric with a high content of sandstone and dolerite inclusions. Weight: 5g.

F77: fill of possible cooking pit F78

This produced a single much abraded bodysherd (**4**) of buff to grey-buff fabric with a high content of crushed dolerite and red sandstone inclusions ($\leq 5 \times 4\text{mm}$). Weight: 10g.

F126: fill of possible cooking pit

This produced a single much abraded bodysherd (**16**) of pale buff to grey-brown fabric with a high content of dolerite and red sandstone inclusions ($\leq 8 \times 5\text{mm}$). Weight: 10g.

F73: fill of possible cooking pit F74

This produced 5g of pottery fragments (**16**).

<i>Site</i>	<i>Vessel</i>	<i>Context/feature</i>	<i>No. of sherds</i>	<i>Rim</i>	<i>Base-baseangle</i>	<i>Neck</i>	<i>Body</i>	<i>Frgs</i>	<i>Inclusions</i>	<i>Vessel size</i>	<i>Decorated</i>	<i>Pottery type</i>	<i>Weight</i>
203.3	1	108	1	1	0	0	0	0	S Q	M	-	LBA	15
	2	108	2	0	0	0	2	0	S D	L	-	LBA	125
	3	83	4	0	3	0	1	3	R S D	S	-	LBA	40
	Other	212	1	0	0	0	1	0	S D	-	-	LBA	5
	Other	77	1	0	0	0	1	0	D R S	-	-	LBA	10
	Other	126	1	0	0	0	1	0	D R S	-	-	LBA	10
	Other	73	0	0	0	0	0	5				LBA	5
			10	1	3	0	6	8					210

Appendix 4 - Lithic Analysis

By *Conor Brady PhD MIAI*

1 Introduction

- 1.1 Three lithic artefacts were recovered during excavations at two separate sites, Site 203.3 and Site 203.4, both in Kilemly townland, Co. Tipperary, under the registration number E2126 on the N8 Cashel to Mitchelstown Road Improvement Scheme (Ministerial Direction Scheme Number A035/000). All of the artefacts were flint and all were unmodified flakes.
- 1.2 Two of the flakes came from Site 203.3 in Kilemly townland where features including six hearths with associated stakeholes, cooking pits and postholes were uncovered. Four possible circular structures were identified. The presence of coarseware pottery indicated a possible Late Bronze Age date to the excavator. Other finds in addition to the lithics included a decorated stone spindle whorl.
- 1.3 The remaining flake recovered under this licence came from Site 203.4, also in Kilemly townland, approximately 20m to the east of Site 203.3. A series of pits and postholes was identified as well as three simple pit cremations and a linear ditch of probable post-medieval date. The flint flake was the only artefact recovered during the excavation - unfortunately retrieved from a secondary context - coming from the fill of the linear ditch. No other artefactual indicators of chronology were recovered during the excavation.

2 Raw Material

- 2.1 Pebble flint appears to be the only type of flint used for knapping in this assemblage and was probably sourced in the local glacial tills (Woodman et al. 2006, 81-3).
- 2.2 Flint occurs naturally in chalk and has a range of colours from grey to black and caramel brown. The cortex or outer skin on a nodule of fresh or chalk flint is usually soft and white, or chalky. During times of glaciation, flint was extracted and transported by ice sheets to non-flint bearing areas where it was deposited as a constituent of the general glacial drift (Jackson 1991, 34; see also Woodman 1987; Woodman et al. 2006: 81-3, fig. 3.4). Once deposited, the colour of the material tends to be altered by the absorption of minerals from the local soil and colours vary widely, ranging from shades of grey to

cream through to brown (Dillon 1997, 33). Due to the abrasion and erosion experienced during transportation, any cortex remaining is generally textured or smooth in character rather than being chalky. The size of nodules and pebbles found in glacial drift tends to be much smaller than nodules from *in-situ* chalk deposits because of the stresses to which the nodules were subject during transportation.

3 Artefact Dimensions

- 3.1 The longest piece in this small assemblage is E2126:19 which is a complete utilised secondary flake 20mm long. The other pieces in this assemblage are incomplete; E2126:1, a burnt tertiary flake which is 12mm long and the shortest piece is E2126:2, another burnt tertiary flake which is just 7mm long. Although a very small assemblage, the lengths of the flakes, both complete and incomplete, are consistent with a glacial till origin for the raw material used.

4 Artefact Colour

- 4.1 Because of the degree of burning on two of the three flakes in this assemblage, it was not possible to determine their original their raw material colour. The remaining unburnt piece, E2126:19, was pale yellow in colour. Again, this colour is consistent with a glacial till source for the raw material.

5 Burning

- 5.1 Burning produces a number of characteristics depending on the raw material, including discolouration (often white, grey or pink for flint), cracking/crazing, brittleness, sugary texture, pot-lid fractures and a lustrous surface. These characteristics may occur singly or in combination on a piece (Woodman et al. 2006: 98). While it is known that some cultures have used controlled heating to improve the flaking properties of flint (Whittaker 1994: 72-4), the signs that most commonly appear on artefacts in Ireland are the result of uncontrolled burning which can damage a piece. Burning may have taken place in prehistory at the time of the initial discard of the artefact in which case the position of an artefact on a site may indicate the presence and location of a hearth, or burning may be a post-depositional process, e.g., crop burning or forest fires. As mentioned above, two of the flakes in this assemblage, both of which are incomplete tertiary flakes, E2126:1 and

E2126:2, are burnt. However, it should be noted that a number of studies have shown that exposure to heat and flame can produce no discernible changes on a proportion of pieces so that the visibly burnt proportion of an assemblage may be an indication only of the minimum amount that has been affected (Woodman *et al.* 2006, 98).

6 Behavioural Analysis

6.1 Because of the very small size of each of these assemblages it is impossible to offer a concrete explanation of the range of behaviours represented by these lithics. Both sites contain features suggestive of domestic occupation and related activities and the form of the lithics fit well with this interpretation.

7 Chronology

7.1 No chronologically diagnostic pieces were present in the assemblage. However, the general form of the artefacts is indicative of a broad Neolithic/Early Bronze Age date for the activity represented. The possible association of the lithics from Site 203.3 is interesting, indicating a Late Bronze Age date for at least their deposition. The chronology of the decline in flint use in Ireland is relatively poorly understood but lithics are known from a variety of Bronze Age contexts (e.g. Waddell 1990).

8 Conclusion

8.1 The number of lithics recovered from Sites 203.3 and 203.4 is extremely small limiting the possibility for detailed interpretation of the activities and processes involved in their production, use and discard. Indeed, the context of the lithic from Site 203.4, in what may be a secondary location, further limits the interpretative potential. However, the presence of the lithics at the sites point broadly to small-scale activity perhaps directed towards processing of foodstuffs or other craft activities during the Neolithic or Bronze Age.

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Catalogue

All artefacts were measured to the nearest millimetre and weights were recorded for all flint pieces to the nearest gram. The colour of all flint pieces was recorded objectively using Munsell Soil Colour Charts where macroscopic assessment was not precluded by cortex, patination or burning (Woodman *et al.* 2006: 86).

Abbreviations:

L: Length

B: Breadth

Th: Thickness

Wt: Weight

Plat W: Platform Width

Plat D: Platform Depth

E2126:1 An incomplete unutilised burnt tertiary flint flake with the left lateral and distal end missing. The platform is missing and the percussion used to detach the piece is unclear. It has a feather termination and there are multi-directional flake scars on the dorsal face. The flint is opaque and the colour of the flint is indiscernible due to the degree of burning.

L: 12mm B: 7mm Th: 2mm Wt: 1g

Munsell No.: n/a

E2126:2 An incomplete unutilised burnt tertiary flint flake. The platform is missing and the percussion used to detach the piece is unclear. It has a feather termination. The condition of the piece is fresh and the flint is opaque and the colour of the flint is indiscernible due to the degree of burning.

L: 7mm B: 5mm Th: 2mm Wt: 0.5g

Munsell No.: n/a

E2126:19 A complete utilised secondary flint flake. The piece has a plain platform and soft hammer percussion was used to strike it. There is a characteristic lip at the junction of the ventral face and the platform indicating this. It has a feather termination and there are parallel flake scars on the dorsal face. The condition of the piece is fresh and the flint is opaque and pale yellow in colour. The piece has a textured brown cortex *c.* 1mm thick.

L: 20mm B: 16mm Th: 3mm Wt: 3g

Munsell No.: 2.5Y 8/2

Appendix 5 - A spindle whorl from Killemlly, Cahir Co. Tipperary

By Richard O'Brien

1 General Introduction

- 1.1 Hand spinning of fibres was the earliest method to make yarn for clothing until the invention of the spinning wheel in the Middle Ages. The hand spinning was generally done using a spindle, usually of wood, weighted at one end with a perforated object giving balance and equilibrium during spinning. This weight is classed as the spindle whorl, or whorl. The task is universal and is still in use today in poorer countries. However spinning can be done without using a whorl; a thin relatively straight branch with bulbous end can serve the purpose adequately.

- 1.2 As hand spinning was such an integral part of everyday life any materials to hand were utilised by the spinner. Raw materials as diverse as human femur ends, to lead, wood, bone, antler, clay, Samian ware, jet, lignite, amber, bronze, iron, stone (generally sandstone but occasionally mudstone, limestone and slate), glass, coal and even dried cow dung have been used as whorls. Whorls were also used as parts of necklaces and thus the one object served a dual-purposeful function. However the primary function was weight and this needs to be known when a new object is being classified.

2 Irish Evidence

- 2.1 In Ireland early prehistoric whorls are rare as the raw materials were probably organic, and thus generally do not survive. It is likely than Neolithic people spun wool and other fibres into thread for clothing, but no definitive examples exist. Bronze Age examples are becoming more frequent but it is the Early Medieval, Hiberno-Norse and Medieval periods that the vast majority of whorls survive from. The stone varieties are predominant as they naturally survive better, but on some Early Medieval sites bone whorls have been found to predominate. The classic example is Cahercommaun Stone Fort in Co. Clare, where Hencken, excavating in 1934 defined a 4-stage criteria for bone and stone whorls; from plain hemispherical cut femur-ends through to circular, disc-shaped stone whorls finally, to lathe-turned, finely decorated bone bowl-type whorls (Hencken, H. 1938). There was a later tendency to date whorls based on the decorative motif with a view that concentric circles could signify an Early Historic date (Laing, L. 1975, 285; Sheehan J. 1990, 35) but this view is now dis-credited (O'Brien, R. 1994).

2.2 Three whorls (2 bone hemispherical and 1 stone disc-shaped) were said to have derived from the Late Bronze Age occupation levels at Ballinderry 2 Crannog Co. Offaly (Hencken, H. 1942, 9 & Fig 6) although the dating of this site was later questioned. There are potential Late Bronze Age whorls from Freestone Hill Co. Kilkenny where 3 bone (2 hemispherical and 1 bowl-shaped) were found along with two fragments of stone whorls (Raftery, B. 1969, 61). The increased discovery of prehistoric sites in the last few years has led to more definitive Bronze Age whorls being found, and it is likely that Early Bronze Age and Late Neolithic examples will be found in due course.

2.3 A similar, circular disc-shaped stone whorl to the Killemlly example was found from a Late Bronze Age site at Ballyveelish, Co. Tipperary (Doody, M. G. 1987, Fig. 2:4, No. 608). A siltstone circular disc-shaped stone whorl was found in the clay capping of a trough pit on a fulacht fiadh in Coarhamore, Co. Kerry dated to 2950 ± 80 B.P (Sheehan in Buckley, V. 1990, 35). Although first thought by the finder to be Early Historic in date, largely based on decoration, this whorl can now be firmly dated to the Late Bronze Age (O'Brien, R. 1994). Another circular disc-shaped stone whorl was recovered from topsoil but within Excavation Area 1 on Knockadoon Hill, Lough Gur, Co. Limerick (Cleary, R. 2003, 131, Fig. 17, No. 1124). A circular disc-shaped stone whorl was found within a post-hole of a post-built house at Lahesseragh, Site C, Nenagh, Co. Tipperary, in direct association with a saddle quern and charred seeds (O'Brien, R. 2001, 182).

3 Irish Whorl classification:²

3.1 A weight range between 7.8g and probably not exceeding 500g, depending on the type of yarn desired, and the source fibre. The lighter the whorl the finer the yarn.

3.2 A diameter range between 34 – 134mm, mean range 35 – 131.4mm. A diameter less than 30mm was probably too small to have allowed the whorl turn clock-wise during spinning. An anti-clockwise movement during the spinning was counter-productive.

3.3 A thickness range between 2.8mm – 24.3mm, mean range 3 – 15.4mm. The whorl thickness does not have to be completely uniform. Whorls thickness at the centre naturally performs better as the grip on the spindle is easier during the movement.

² Based on Masters Thesis 1994

- 3.4 Overall shape is generally circular to allow the correct clock-wise movement on the spindle; once there is some balance across the whorl a perfect circular shape is not a prerequisite for good functionality.
- 3.5 The section profile largely depends on the material used, so stone generally is disc-shaped, bone being hemispherical.
- 3.6 A central or almost central perforation with a profile not overtly slanted. A perforation size between 7.5 – 33.9mm in diameter, with mean range between 8.8 – 26.5mm. A diameter below 3mm is too narrow to have gripped the spindle sufficiently to spin even the lightest of fibre. Such objects with narrow perforations were probably beads; conversely too large a perforation nullified the use of the weight.
- 3.7 Decoration cannot be used to date whorls as the common concentric circles around the perforation are the simplest and most obvious way to decorate such objects, and such decorated examples are found from the Bronze Age right through to the Medieval era. The bowl-shaped examples from Cahercommaun included perfectly concentric circles with ring-and-dot motifs but these are rarities. Type and degree of decoration was down to the spinner's preference so variation is to be expected.

4 Discussion

4.1 *Killemly 06E2126:15 (Fig. 11; Pl. 28)*

This object is circular in plan, and disc-shaped in section. The raw material is probably a local mudstone. Only half the object survives as the lower face was broken-off in antiquity. This affects what can be deduced about the original weight and thickness of the whorl but an estimate of original weight is proposed.

4.2 *Description*

The surviving surface is very smooth probably polished. There is a modern break (fixed) and a number of small shallow striations across the face, probably made by the boring object used in the decoration. The reverse is uneven.

4.3 *Dimensions*

The whorl measures between 35-38mm in diameter, with a minimum weight of 8g and a minimum thickness of 9mm. The whorl probably did not exceed 15g when complete and would have been a perfect weight for spinning wool fibres.

4.4 *Perforation*

It is central and hourglass in profile, bored from both faces and 4mm in diameter.

4.5 *Decoration*

The surviving surface is characterised by 3 complete concentric grooves angled at each corner. They have been very roughly executed probably with an awl that has been ground into the surface, fairly deeply in places. At one edge 2 further cuts may be putative decoration or stray striations. The depth of the decoration is unusually deep and wide and its form has no subtlety. Although the decoration has been clumsily executed it does represent the earliest occurrence in Ireland where more than one concentric line is found on a spindle whorl.

There are no exact parallels for this whorl but an undated disc-shaped whorl from Church Island, Co Kerry is the closest match in decorative terms, with 3 roughly and irregularly scratched concentric circles on one face only (O'Kelly, M.J. 1958, 101 & 113 [Fig. 14, no.7]). The Coarhamore Late Bronze Age disc-shaped whorl had a single concentric circle near to its edge on both faces (Sheehan in Buckley, V. 1990, 31 Fig. 14). This was a much thinner and finer decoration than the Killemlly whorl.

5 **Conclusion**

- 5.1 Notwithstanding its incomplete condition the Killemlly whorl is a classic stone spindle whorl of the disc-shaped variety. This type is dated from the Late Bronze Age through to the medieval period. Although heavier the Killemlly whorl is similar to the Coarhamore whorl (weight 9.5g, diameter of 30-32mm and mean perforation diameter of 4mm). As the Killemlly site has been dated to 2918 B.P. (1256-1012 cal BC (2 sigma) (UB-7205)) it represents another example of a growing number of prehistoric spindle whorls. It also represents the earliest example in the country where 3 concentric lines decorate a spindle whorl.

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Appendix 6 - Post Medieval Pottery

By Niamh Doyle MA MIAI

1 Methodology

1.1 The pottery fragments were identified visually in accordance with existing typologies. A brief description of fabric and decoration is given. Pottery types were identified based on information from published excavations in Ireland and existing typologies.

2 Dating and Quantification

2.1 Date ranges for the pottery types are based on published dates for the production and distribution of pottery excavated from archaeological sites in Ireland, England and the United States of America.

3 Site 203.3

3.1 The assemblage contains a single rim fragment representing a North Devon Gravel tempered storage jar. North Devon Gravel tempered ware was imported into Ireland from England in the 17th and early 18th century. Vessels of this type were used in the dairy, the scullery and kitchen for food preparation and household chores. The jar represented from Site 203:3 has a rim designed to hold a lid in place.

Licence Number	Site number	Feature number	find number	Category	Description
E2126	203.3	1	E2126:18	Ceramic	Pottery. North Devon Gravel Tempered ware. Storage jar. Rim fragment

Appendix 7 - Charcoal Analysis

By Lorna O'Donnell

1 Introduction

1.1 Charcoal was examined from two sites at Kilemly, Co. Tipperary, excavated by Melanie Mc Quade. Six samples were identified from site 203.3, including hearths and postholes from this Bronze Age settlement site. Two samples from cremation deposits were examined from a nearby Late Bronze Age funerary site at 203.4.

2 Methodology

2.1 *Sampling and processing*

The samples were taken on site as bulk soil and were processed by flotation, whereby each sample was soaked in water in order to suspend the carbonised material; this was then poured off and trapped in a sieve (mesh size 300µm). This “flot” (i.e. the floated material) was dried and stored in sealed plastic bags. The samples were processed by Laoise Cronin, Christina Gomez and Alessandro Soggi.

2.2 *Identification of the charcoal*

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 taxa 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.

3 Results

203.3

- 3.1 Samples were examined from six contexts on this site, from three hearths and two stake/postholes. Overall, the charcoal level was relatively low. Seven taxa were identified, these are hazel (*Corylus avellana*), ash (*Fraxinus excelsior*), pomaceous fruitwood (Pomoideae), wild/bird cherry (*Prunus avium/padus*), oak (*Quercus* spp.), willow (*Salix* spp.) and elm (*Ulmus glabra*). Oak was the main tree used on site (Fig. 1).

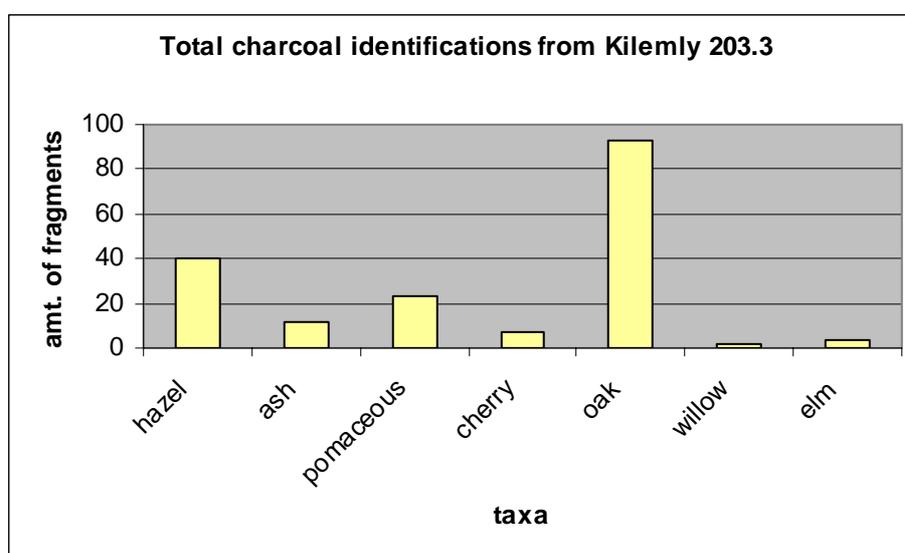


Fig. 1

3.1.1 Sample 2 Feature 8 Hearth

Oak, willow, hazel, cherry, pomaceous fruitwood and elm were identified from this hearth fill. Most of the pieces were probably derived from branches, and were generally of medium growth.

3.1.2 Sample 5 Feature 4 Cut F3 Hearth

Oak, elm, hazel, cherry and the pomaceous fruitwood type were identified from this sample. The charcoal level was low with only small fragments present. This may suggest that the hearth was cleaned after its final use, or that it burnt at a high temperature reducing a lot of the wood to ash.

3.1.3 *Sample 9 Feature 79 Cut F118 Cooking pit*

The highest level of charcoal was present in this sample. Oak, elm, holly, ash and cherry were identified. The material was clearly dominated by oak. The oak pieces were of mixed growth, alternating between slow and medium and had up to fifteen annual rings present. About half of the oak examined probably derived from branches, as evidenced by their strongly curved annual rings. The other half were more likely from oak heartwood, as their annual rings were weakly curved and tyloses (Fig. 2) were evident in the spring growth. Tyloses occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). The hazel pieces were quite degraded, with many insect holes, suggesting the collection of dead wood, as were the holly pieces. The ash pieces had up to seventeen annual rings present, and were all of slow growth, indicating that conditions were not optimum for ash in the area.

3.1.4 *Sample 19 Feature 138 Cut F134 Posthole (possible drying rack)*

Five taxa were identified from this posthole, hazel, pomaceous fruitwood, elm, ash and oak. In comparison to Sample 30, a small amount of fragments (only eleven) were identifiable.

3.1.5 *Sample 22 Feature 85 Hearth*

Charcoal fragment level was again low from this hearth sample, with only eleven fragments identifiable. Hazel, ash, oak and pomaceous fruitwood were identified.

3.1.6 *Sample 30 Feature 171 Cut F170 Posthole*

The charcoal level was low from this posthole. Five taxa were identified, oak, cherry, pomaceous fruitwood, hazel and ash. Oak was found more frequently than the others, but as only ten fragments were identifiable, too much emphasis cannot be placed on this.

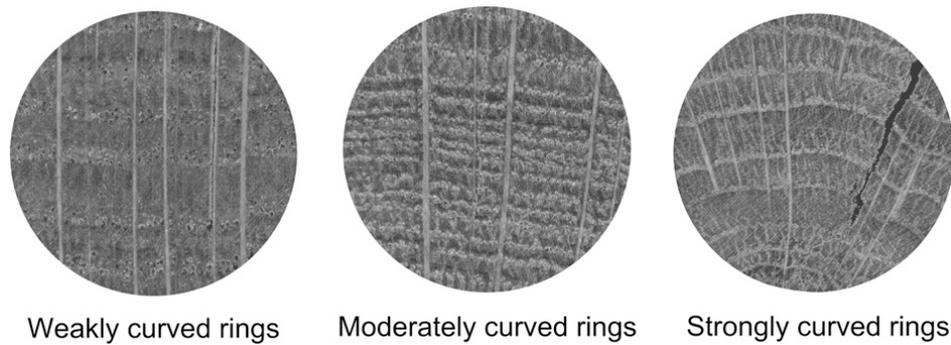


Fig. 2 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.

(After Marguerie and Hunot 2007 1421, Fig. 3)

203.4

3.2 Hazel, cherry, blackthorn, oak and elm were identified from Kilemly 203.4. The main trees used on site were oak and hazel (Fig. 3).

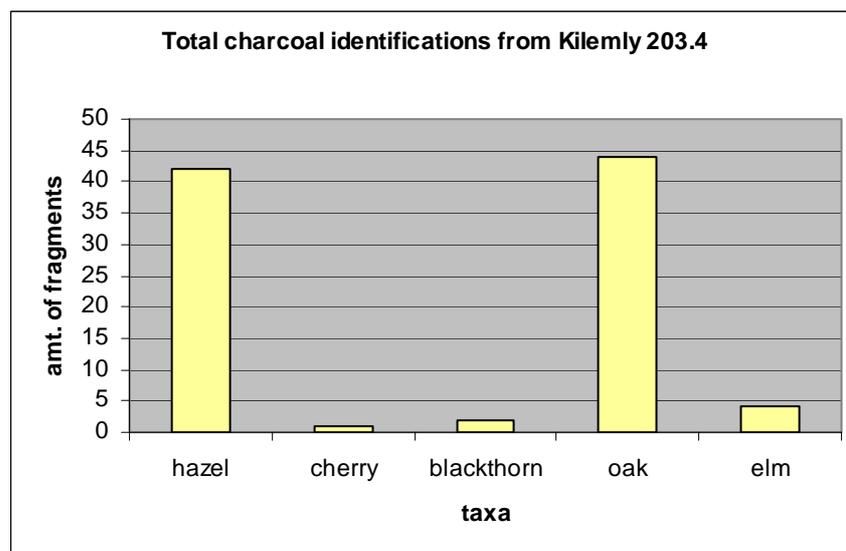


Fig. 3

3.2.1 Sample 6 Feature 20 Cremation pit F19

Oak and elm only were identified from this sample. Oak was the main tree used. The fragments were small, between five to eight mm. Two to three annual rings were noted on the pieces, but they were too small to ascertain whether they came from branches or heartwood.

3.2.2 Sample 9 Feature 75 Cremation pit F74

Hazel, oak, cherry and blackthorn/sloe were identified from this sample. Hazel was the main species present. The growth was slow in most of the hazel pieces, and insect holes indicate that they were gathered as dead wood. The presence of strongly curved annual rings (Fig. 2) and some roundwood fragments indicates the use of branches. Many of the pieces were at least ten years old. In comparison to the hazel, the oak pieces also had strongly curved rings. This coupled with the lack of tyloses in the early wood vessels suggests the use of branches. Growth was mixed, medium and fast.

3.3 Charcoal from two Phases of use of the Kilemly site 203.3 were examined, dating to the Middle and Late Bronze Age. Features 4 and 8, both hearths dated to the earlier phase, while Features 79, 138, 85 and 171 a cooking pit, stake hole, hearth and posthole respectively dated to the later Phase. Figs. 4 and 5 shows that very similar trees were present both in the Middle and Late Bronze Age around the Kilemly area. Hazel, pomaceous fruitwood, cherry, oak, willow, holly and elm were identified from both periods. In comparison to the Late Bronze Age deposits at Kilemly 203.3, the charcoal from the Late Bronze Age cremation deposits at Kilemly 203.4 also contained hazel, cherry, oak and elm.

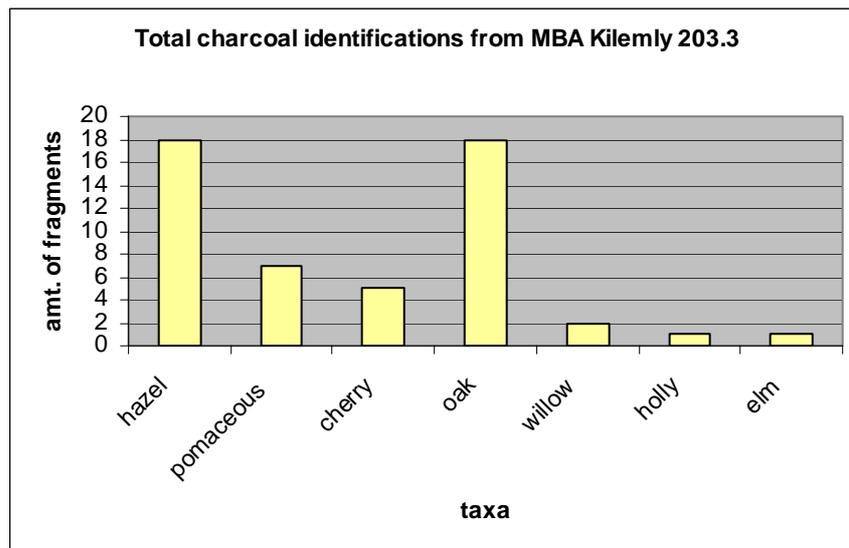


Fig. 4

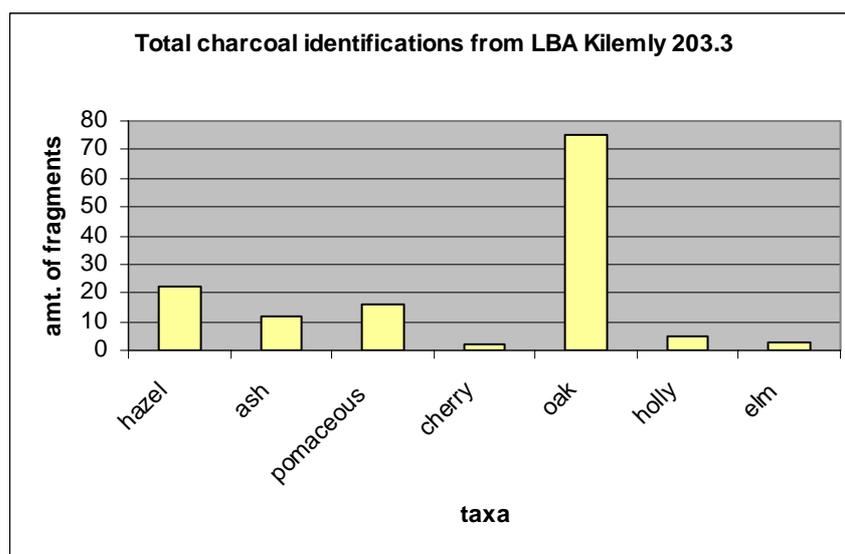


Fig. 5

4 The Kilemly environment

4.1 Hazel and oak were both important during the Middle and Late Bronze Age period in the Kilemly area. Oak is frequently identified from Irish archaeological deposits. It is a strong, hard wearing tree, and for these reasons it was often selected as structural wood and its excellent fuel properties often result in its selection for fuel. The very toughness of oak and its resistivity to insect attack means it can be over identified from archaeological samples. The sessile oak (*Quercus petraea*) prefers to grow on well drained, shallow, moderately to strongly acidic soils (Preston *et al* 2002, 131). The pedunculate oak (*Quercus robur*), prefers soils which are heavy and fertile, but is also quite tolerant of waterlogged areas and acid peat (Preston *et al* 2002, 132). Hazel is also quite a tolerant tree and can grow in a wide range of conditions, from wet to dry but not waterlogged (Orme and Coles 1985). The values for both oak and hazel were high from all time periods at Kilemly, so it is quite likely that an oak-hazel woodland could have been growing nearby to the site. Elm could have been part of this woodland.

4.2 The presence of cherry, blackthorn and the pomaceous fruitwood type (which includes apple (*Malus sylvestris*), pear (*Pyrus pyraeaster*), hawthorn (*Crataegus monogyna*), rowan (*Sorbus aucuparia*) and whitebeam (*Sorbus aria*) indicate that closed canopy woodlands did not prevail, as these trees prefer light to grow. Possible crab apple seeds were identified from this site (Halwas 2007), indicating this may be the tree the pomaceous

fruitwood type represents. These small, deciduous scrub trees prefer to grow in the open and in woodland margins (Preston *et al* 2002 237). Ash, a larger tree, will also only grow if there are suitable levels of light present. The only indications of any wetland in the area come in the form of two willow fragments from one sample. As willow will only grow near a water source, it is likely that a stream or some waterlogged areas were in the vicinity. The overall impression from the charcoal, however, is that of a primarily dryland area with larger canopy trees of oak, ash and elm, with a probable understorey of hazel. Smaller, scrub and shrubs were also probably in the vicinity such as cherry, sloe and the pomaceous fruitwood type.

5 Discussion

- 5.1 The fuel used from Kilemly is all native, and commonly identified throughout the Bronze Age in Ireland. Oak was present in all eight samples from the two sites, hazel was present in seven, while the pomaceous fruitwood type was noted in six of the samples. Pollen diagrams (for example Molloy 2005) have shown how ubiquitous both oak and hazel were in the Munster area during the Bronze Age. The pomaceous fruitwood type is also frequently identified from charcoal from Bronze Age sites.

- 5.2 Two samples were examined from postholes from Kilemly 203.3, to ascertain what type of wood was used for building, from Features 138 and 171. Five wood types were identified from each of these postholes, and therefore are more likely to represent on site burning than the roundwoods which were used as posts. It is always useful to sample postholes, but they need to be burnt *in situ* to demonstrate the wood used, and this can often be difficult to tell on site. Three hearths were examined from this site, from Features 4, 8 and 85. The level of charcoal was quite low from the hearths, for example it was not possible to identify 100 fragments from any of them. The charcoal level was particularly low from Features 4 and 85, only 0.54g and 0.16g could be identified respectively from them. The level of charcoal was slightly higher from Feature 8, 1.05g of identifiable charcoal was extracted from here. There are a variety of reasons why hearth deposits may not be rich in charcoal such as the fire being cleaned out after the last burning or the fire burning at a high temperature which could reduce the wood to ash instead of charcoal. For example, less dense woods such as hazel and willow will turn to ash more quickly than oak heartwood.

- 5.3 Charcoal was examined from one cooking pit from Kilemly 203.3 (F79). This sample was one of the most charcoal rich of the assemblage and was dominated by oak. This tree is an excellent fuel and would have been able to provide high temperatures in the cooking pit.
- 5.4 The composition of the two cremation pits from 203.4 were different in some ways. Both of the pits contained oak, which is frequently chosen as a fuel for the cremation process, because of the high temperatures it is capable of achieving. Oak was the main fuel in cremation pit F19 (Fill F20) while hazel was the main fuel in cremation pit F75 (Fill of Cut F74). The cremated human bone in both of the deposits was white, which indicates successful cremation. Therefore the charcoal within the pyres must have been capable of reaching temperatures in excess of 700-800 degrees C (Geber 2007). Elm was present in F20 and cherry, blackthorn and hazel were present in cremation F75. Obviously the combination of these trees was capable of reaching the high temperatures required to cremate the bone fully. The variety of trees used at Kilemly indicates that the fuel was gathered randomly, there are no particular patterns in the selection of the material, for example oak will often be favoured for use in metal working or for cremation pyres.

6 Comparative material

- 6.1 The recent boom in Irish infrastructure means that more and more comparative environmental information is being examined than ever before previously. Excavations from along the Gas Pipeline to the West stretching from Dublin to Clare indicated that oak is the preferred fuel for cremation deposits with human remains during the Bronze Age in Ireland along that route (forty-six samples from twenty sites). There are, however, a variety of other species evident (fifteen in total). When one examines the results from the Late Bronze Age (eleven samples from three sites), oak is the dominant fuel, but other trees are also present, such as the pomaceous fruitwood type, hazel, ash and alder (O'Donnell forthcoming a).
- 6.2 At the nearby Bronze Age site of Cloghabreedy of 125.5 (E2274), charcoal was analysed from a cremation pit, with oak being the only fuel present (O'Donnell forthcoming b). Oak was important in both the cremation pits from Kilemly, but, however, other trees were also used. There could be a variety of reasons for this, oak may not have been freely available in the area or other trees may simply have been chosen for the cremation

process. This may be related to cultural selection or could simply reflect the availability of fuel at the time. However, there are many cases where oak is not the main fuel present, for example at the Early Bronze Age site of Laughanstown, Co. Dublin (03E1471), cherry was the main fuel used, while at Charlesland, Co. Wicklow (Site F 04E0147), charcoal from two Middle/Late Bronze Age pits produced a variety of species dominated by ash (O'Donnell 2004a & b). The pattern that can be ascertained thus far by the author of Bronze Age burial in Ireland is that oak was heavily relied on as a pyre material probably because of its high calorific value when burning. Yet there frequently is a variety of other species turning up in cremation deposits, often trees that wouldn't achieve the high temperatures required for successful cremation. Other trees may have been used in the cremation process as kindling, for decoration or for aromatic properties. Oak is the only tree from Kilemly that was present in each of the seven samples, so it must have been available in the locality.

- 6.3 Nearby comparable Middle Bronze Age settlements include Knockgraffon (E2271 129.1) and Cloughabree (E2274 125.4). At Knockgraffon, hazel, alder and the pomaceous fruitwood were identified from the Middle Bronze Age from a possible internal roof support of a circular structure (O'Donnell 2007a). At Cloughabree samples were examined from various structural components from Middle Bronze Age settlement. Oak dominated the material, and was probably the main tree used for building. Pomaceous fruitwood, hazel, alder and cherry were also present (O'Donnell 2007b). The Late Bronze Age elements of Kilemly 203.3 can be compared to the nearby settlement sites of Suttonrath (206.2 E2128) and Ballylegan (E2265 207.1) (O'Donnell forthcoming b and c). Almost all the wood used at Kilemly was also used at Suttonrath, with the exception of willow and blackthorn. Oak and hazel were the most frequently used trees at Suttonrath, in comparison to Kilemly. In comparison to Kilemly and Suttonrath, oak and hazel were the most important trees used at Ballylegan. Cherry, blackthorn, elm and willow, present at Kilemly were not identified from Ballylegan. The results indicate that in the vicinity, oak and hazel were very important and frequently used. The low amounts of evidence for more wetland trees such as alder, willow and birch indicate that the sites were located in a primarily dryland area.
- 6.4 At the Bronze Age structures of Chancellorsland, Co. Tipperary, Structure 6 was a substantial rectangular building, made of oak (*Quercus* spp.), hazel and ash. Oak, hazel and willow/poplar (*Salicaceae*) were used in Structure 10. Alder was used in structure 15,

hazel and oak in Structure 24, while oak and elm were among the taxa used in Structure 12 (Doody 2000, 144). At Bronze Age roundhouses in Kilgobbin, Co. Dublin, ash was the preferred structural timber, in contrast to oak which was used for Neolithic houses on the same site (O'Carroll 2004).

7 Summary

7.1 Eight samples were examined from Kilemly, Co. Tipperary, that date to the Middle and the Late Bronze Age. Seven trees were used on site as fuel. Hazel and oak were the most important. Fuel levels were low from some of the hearth samples, which may be evidence that they were raked out after their final use. The variety of wood from the posthole samples suggests the posts were removed and domestic on site charcoal built up within the post holes, and therefore doesn't represent the actual structural material. When it could be discerned, a mixture of heartwood and branches was used as fuel. Many of the hazel branches were insect infested, suggesting that dried, decayed wood had been gathered as fuel. No particular fuel patterns were noted on site, which indicates that the trees were gathered randomly. When the charcoal from the Middle Bronze Age and Late Bronze Age deposits from Kilemly 203.3 were compared, no particular differences were noted, indicating that foliage cover remained similar between the two time periods. The identifications from the site compare well with those from other Bronze Age sites in the Tipperary vicinity, with an emphasis on the use of oak and hazel. The charcoal identifications from the two cremation pits at Kilemly 203.4 were different, one dominated by oak and the other dominated by hazel. Oak is commonly found as a pyre fuel, but other trees are also often present, such as hazel, pomaceous fruitwood and cherry.

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Table 1 Charcoal identification details from Kilemly 203.3

Sample	2	2	5	5	9	9	19	19	2	22	30	30	
Feature	8	8	4	4	79	79	13	8	138	5	85	17	171
	f	w	f	w	f	w	f	w	f	w	f	w	
<i>Corylus avellana</i> L. Hazel	1 5	0.4 7	3	0.0 4	12	0.2 5	5	0.0 5	4	0.0 9	1	0.0 1	
<i>Fraxinus excelsior</i> L. Ash					7	0.3 3	2	0.0 1	2	0.0 1	1	0.0 1	
Pomoideae L. / Miller Pomaceous fruitwood	2	0.0 5	5	0.1 8	11	0.4 4	2	0.0 2	1	0.0 1	2	0.0 1	
<i>Prunus avium/padus</i> L. Wild/bird cherry	3	0.0 8	2	0.0 1							2	0.0 2	
<i>Quercus</i> spp. L. Liebl Oak	8	0.3 9	1 0	0.3	65	4.4 6	1	0.0 1	4	0.0 5	5	0.0 8	
<i>Salix</i> L. Willow	2	0.0 4											
<i>Ilex aquifolium</i> L. Holly			1	0.0 1	5	0.1 6							
<i>Ulmus glabra</i> L. Elm	1	0.0 2			1	0.0 1	1	0.0 1					

Table 2 Charcoal identification details from Kilemly 203.4

Sample	6	6	9	9
Feature	20	20	75	75
	f	w	f	w
<i>Corylus avellana</i> L. Hazel			42	1.19
<i>Prunus avium/padus</i> L. Wild/bird cherry			1	0.01
<i>Quercus</i> spp. L. Liebl Oak	19	0.24	25	1.19
<i>Ulmus glabra</i> L. Elm	4	0.04		
<i>Prunus spinosa</i> L. Blackthorn			2	0.06

Appendix 8 - Analysis of plant remains

By Sara Halwas

1 Introduction

1.1 Samples from Sites 203.3 and 203.4, directed by Melanie McQuade, were analyzed as part of the N8 Cashel-Mitchelstown roadway project which began in 2005. Site 203.3 contained four possible structures and three phases of activity (Early Bronze Age, Late Bronze Age and Post Medieval period). Site 203.4 comprised three phases; Phase 1 included three Late Bronze Age cremation burials; Phase 2 a series of Iron Age domestic features; Phase 3 Post Medieval agricultural features. Sediment samples were collected throughout the excavations and based on the previous assessment (Halwas 2006) nine of ten samples submitted were chosen for full archaeobotanical analysis. This report details the findings of these analyses and presents botanical information for the site.

2 Methodology

2.1 All plant remains identified from the recovered samples were preserved through carbonization. This is a process where high temperatures convert plant materials into inert carbon which is resistant to decay. Bulk samples were collected on site by Margaret Gowen & Co. Ltd. and processed by simple flotation. Generally five litres is sub-sampled from the bulk sample; if the sample is less than five litres, it is processed in its entirety. The sediment is placed in a bucket with water and gently agitated by hand to loosen the charred remains from the soil. The charred remains float to the surface of the water (known as the flot) and are poured off through a 250 µm sieve. This process is repeated until no remaining material float to the surface. The remainder of the sample is washed through a 1mm sieve to collect any large charred plant remains, and lithic, faunal, and ceramic artifacts. This is referred to as the retent. Both the flot and retent are placed in trays on newspaper to dry.

2.2 Each sample is scanned under a low power binocular microscope (magnification x4.5 to x56). All materials are identified with a series of identification manuals (see Beijerinck 1976; Berggren 1981; Cappers, Bekker and Jans 2006; Martin and Barkley 2000; Montgomery 1978), and a modern reference collection, accessed through the herbarium (Botanical Gardens, Glasnevin).

- 2.3 Nomenclature generally follows Stace (1997); where nomenclature deviates from Stace, Preston, Pearman and Dines (2002) is followed. In order to facilitate easy reading of this report taxonomic order has been simplified into base categories including cereals, weeds and fruits, which are listed in tables at the end of the report; the plants are named in English within the body of the text first with the scientific name (in Latin) following the first mention of the plant species.

3 Results

- 3.1 Three samples from Site 203.3 and six samples from Site 203.4 were examined representing the Early and Late Bronze Age. Limited quantities of barley (*Hordeum* sp.) and weed seeds including fat-hen (*Chenopodium album*), dock (*Rumex* sp.) and knotweeds (Polygonaceae family) were recovered. One sample from Site 203.3 and two from Site 203.4 did not produce any plant remains.

3.2 *Site 203.3 Phase 1: Early Bronze Age*

This sample was collected from the fill of a hearth featured and contained mainly barley (*Hordeum* sp.) and indeterminate cereal grains. Barley is considered to be the dominant crop during the Bronze Age. It was a cheap and easy crop to grow, and could be used for human consumption as flour, in breads, porridges, gruels and soup bases (Sexton 1998), and as animal fodder (Kelly 1998). There were also a number of indeterminate grass seeds (Graminae), orache (*Atriplex* sp.), smartweeds (*Persicaria* sp.), possible fat-hen (*Chenopodium cf album*), and members of the knotweed family (Polygonaceae) in this sample. These species are weeds of arable land and disturbed places, and were probably harvested with the crop and brought back on site.

This sample exhibits frequent charred weed seeds and cereal grains. Agricultural crops were processed in stages. The crop was dried to reduce moisture, fumigated for pests, and to make the chaff brittle and easier to remove and harden the grain for subsequent milling (Monk 1985). Crops were then coarsely threshed, raked, winnowed, and sieved to remove the large portion of straw, chaff and weed heads in the crop. Fine sieving removed smaller weed seeds and awns. Pounding and a second winnowing removed lemmas and paleas (glumes hugging the grain); more coarse and fine sieving removed any unbroken spikelets and small weed seeds. Finally the sample was checked over by hand to remove the smallest weed seeds (Stevens 2003). This sample contained only

barley grains (*Hordeum* sp.) and weed seeds; no chaff was recovered. This sample may suggest a processed crop which had been poorly cleaned. Since no chaff was recovered, there is no evidence of crop processing or storage on site, suggesting the barley may have been brought to site already cleaned. The high incidence of weed seeds recovered with the grains may indicate agriculture was practiced in the area (Monk 2000). The knotweeds and fat-hen seeds all exhibit signs of expansion caused by exposure to heat (Wilson 1984) which suggests the sample was the remnants of domestic activities.

3.3 **Phase 2: Late Bronze Age**

Two samples from a cooking pit (S8 F81) and a hearth (S22 F85) were examined for plant remains. The hearth contained no plant remains, while the cooking pit contained a few indeterminate cereal grains and a moderate amount of weed species, including fat-hen, dock (*Rumex* sp.), knotweeds (Polygonaceae family), bedstraw (*Galium aparine*), orache, and mustard (*Brassica* sp.). The fat-hen, dock and knotweeds are all commonly recovered weed species of arable fields, but the lack of identifiable cereal grains and chaff in conjunction with the weeds does not allow for a crop processing or storage interpretation. As well, the weed plants produce large numbers of seeds which are distributed by wind, people and animals. It is more likely that these seeds were present around the pit and were incorporated into the fill.

3.4 **Site 203.4: Late Bronze Age**

Five pit features and one cremation burial were sampled. One pit (S3 F26) contained no charred remains. The cremation burial (S8 F15) contained a single poorly preserved possible barley grain (cf. *Hordeum* sp.). Most cremations lack plant remains temperatures of 700-800 degrees Celsius are required to cremate a human body (von Rainer Knusmann 1988). Temperatures of 500 degrees Celsius will ash most chaff and straw and most cereal grains (Boardman and Jones 1990). Weed seeds are generally not as robust as cereal grains and will be destroyed at even lower temperatures. Johnston (forthcoming) did identify barley from cremation burials excavated along the Gas Pipeline to the West. But in that case the samples where cereals survived contained significant quantities which indicated specific inclusion in the burial. The single grain from this cremation is more likely a stray find and not related to any ritual significance.

The other pits contained a possible barley (cf. *Hordeum* sp.) grain, few indeterminate cereals, and few charred weed seeds including plantain (*Plantago* sp.), smartweed (*Persicaria* sp.), and goosefoot (*Chenopodium* sp.). Gathered foods include hazelnuts (*Corylus avellana*) and a possible cherry/hawthorn stone (*Prunus/Crataegus* sp.). Hazelnuts are a ubiquitous find within archaeological contexts. The shells are dense, inedible and are thrown into hearths or other refuse pits once the internal nut is consumed, increasing the chance of preservation. Hazelnuts are an easy food to gather and store for the winter, and are high in proteins, fats, minerals and vitamins. Mature, dry hazelnuts will store for six months, while roasted nuts can last for up to twelve months (Kelly 1998; MH 2004). There are three cherry and two hawthorn species native to Ireland. Both cherries and hawthorns were utilized as food (Kelly 1998). The paucity of plant remains from these pit features makes it likely that the recovered examples represent stray pieces that were present around the features and became incorporated into the fill.

4 Discussion and Comparison

- 4.1 Based on the limited nature of the plant remains a few observations can be made. Barley was grown during the Early Bronze Age attested to various recent archaeobotanical studies including Charlesland, Sites A and G (03E0018 and 03E0196, respectively) where Johnston (2004a; 2004b) identified caches of barley grains from a domestic hearth feature and a crop processing area. Barley was still utilized during the Late Bronze Age, if one can extrapolate from a single identified grain. It is probable that hazelnuts, cherries and hawthorns were gathered locally to supplement a cereal diet. Archaeobotanical studies have identified wild cherry (*Prunus avium*) stones at a Late Bronze Age site at Ballinderry (Kelly 1998).
- 4.2 The lack of plant remains, especially from Site 203.4, is not uncommon. Many Bronze Age sites contain small quantities of charred plant remains if any at all. Johnston noticed this trend during work on the Gas Pipeline to the West project (see Johnston 2003 for a list of Bronze Age sites with little or no remains) (Johnston forthcoming). The trend seems to be changing and more archaeobotanical information is being uncovered for the Bronze Age. Other sites along the N8 Cashel- Mitchelstown roadway project produced charred cereals and weed seeds. A Early Bronze Age structure from Site 185.5 (E2267) (Halwas 2007a) produced a cache of barley grains, a few emmer wheat grains and a variety of chaff and weed seeds. A Early Bronze Age hearth feature from Site 207.2

(E2265) (Halwas 2007b) produced small quantities of barley and moderate amounts of indeterminate cereals.

5 Summary

- 5.1 Barely and common weed seeds of arable lands were recovered from Early and Late Bronze Age pits, hearths, and a cremation burial. Though information on agricultural practices is scant barley was utilized during both periods. The barley identified from the Late Bronze Age cremation burial (Site 203.4) was a stray find and can not be linked to any ritual significance. Previous Archaeobotanical information for the Bronze Age is limited but these remains add to the slowly accumulating body of information about plant usage in during this period.

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Table 1: Identified plant remains from Sites 203.3 and 203.4

Site	203.3	203.3	203.4	203.4	203.4	203.4	203.4	203.4
Sample	S5	S8	S1	S2	S3	S5	S7	S8
Fill/Feature	F4	F81	F3	F11	F26	F32	F56	F15
Barley (<i>Hordeum</i> sp.)	24							
Possible Barley (cf <i>Hordeum</i> sp.)				1				1
Indeterminate cereals	59	10	2					
Fat-hen (<i>Chenopodium</i> cf <i>album</i>)	18	11						
Goosefoot (<i>Chenopodium</i> sp.)			1M					
Dock (<i>Rumex</i> sp.)		2					1	16M
Mustard (<i>Brassica</i> sp.)								
Knotweed Family (Polygonaceae)	18	12						
Mustard Family (Brassicaceae)		1						
Bedstraw (<i>Galium aparine</i>)		1						
Plantain (<i>Plantago</i> sp.)			8					
Clover (<i>Trifolium</i> cf <i>repens</i>)	1 M							2M
Orache (<i>Atriplex</i> sp.)	2	1						
Smartweed (<i>Persicaria</i> sp.)	7		3M					14M
Grass Family (Poaceae)	25							
Sedge (<i>Carex</i> sp.)								1M
Fumatory (<i>Fumaria</i> sp.)							1	
Cherry/hawthorn (<i>Prunus/Crataegus</i> sp.)			1					
Raspberry/Elder (<i>Rubus/Sambucus</i> sp.)								3M
Hazelnut (<i>Corylus avellana</i>)			2			1		
Total	151	28	14	1	0	1	2	1

(Modern seeds are designated with an 'M' and are not included in the totals.)

Appendix 9 - Analysis of the cremation burials from Site 203.4

By Jonny Geber MA MA MIAI

1 Introduction

1.1 Three cremation burials (F19, F16, and F74) were found at Site 203.4 in Kilemly on the N8 Cashel to Mitchelstown project. They were located in the northwest area of the site, and had been truncated by previous agricultural activities. The burials date to the Late Bronze Age, a period in prehistoric Ireland from which relatively little about the burial practice is known.

2 Methodology

2.1 There are many obstacles in the osteological study of cremated bone. The main limitations are the often considerable fragmentation and the distortions caused by heat during the cremation process. Another factor is the loss of volume, for a variety of reasons, between burning and the deposition of the bones into the grave that is often evident in ancient cremation burials. All these factors make many of the available osteological methods inadequate when analysing burnt skeletal materials (see Rösing 1977, 54).

2.2 The cremation pit burial was excavated and 100% sampled on site. The bones have thereafter been wet sieved and dried in a controlled laboratory environment. As part of the osteological analysis, the bones were sieved in >10mm, 5–10mm and 2–5mm mesh size categories for the purpose of assessing the fragmentation of the sample. The bone samples were thereafter quantified by estimated number of fragments, weight (to an accuracy of 0.01g) and volume, and identified to species and skeletal elements, body side, colour/degree of incineration, and whether they were clean or sooty.

2.3 Age could only be estimated on basis of evaluating the relative thickness of the tables and the diploë of skull vault fragments (Gejvall in Sigvallius 1994, 10). An attempt to determine the sex based on morphological features was undertaken according to the descriptions by Sjøvold (1988). The method by Gejvall (1948) of sexing cremated skeletal remains from skull vault and long bone diaphyseal thickness measurements was also employed.

- 2.4 The anatomical terminology used in this report is strictly according to the international nomenclature as described by Feneis and Dauber (2000).

3 Results

3.1 Burial F19

A total of about 100ml, or 131.27g and 2767 fragments of cremated bone, was retrieved from cremation burial F19. The bones were clean and bright white in colour, indicating that the bones were sorted from the pyre after a successful cremation. The largest fragment was 35.28mm in linear size and sample was heavily fragmented, with a mean weight per fragment of only 0.05g. This inevitably has had implication on the percentage of the sample which could be identified to species; only 1.01% of the fragments and 25.76% of the weight.

Sex was not possible to determine due to absence of fragments large enough to display sex characteristic traits. Age was however possible to estimate based on a skull vault fragment where the diploë ranged over one third of the total vault thickness and the internal and external layers both were thin; indicating an age at death of between 50-89 years.

3.2 Burial F16

Cremation burial F16 constituted the smallest sample of burnt bone from the site, a mere 11.80g or 198 fragments. Due to the considerable fragmentation, with a mean weight per fragment of only 0.06g, none of the fragments could be identified to either species or skeletal element. The context from which this sample derived does however suggest that it is most likely human remains, but this could not be proved macroscopically from an osteological point of view.

The bones were all well cremated and displayed a bright white colour. The linear size of the largest fragment in the sample was 16.35mm.

3.3 **Burial F74**

The largest sample was recovered from cremation burial F74; a total of 550ml or 654.54g and 9334 fragments. The bones were white in colour and slightly sooty. The largest fragment was 35.72mm in linear size and the mean weight per fragment only 0.07g.

Age at death was estimated to have been between 35-64 years, based on the relative thickness of the diploë and internal and external tables of the skull vault. It was also concluded that this individual probably was male, based on the developed mastoid process of the left temporal bone and the left superciliary arch of the frontal bone which are more marked in males than in females.

4 **Cremation technology and ritual**

4.1 The bones in all three cremation burial deposits were charred white in colour, indicating that the heat temperature exceeded 700-800°C and the cremations was successful in all three instances (Hermann 1988, 578; Wahl 1982, 27).

4.2 The bones were also clean or slightly sooty in appearance. This is related to how the bones were treated after the cremation. Cremated bone will eventually get sooty if they are deposited with the sooty remains after the pyre and acquire a greyish colour to them. Clean bones on the other hand take up the colour from the surrounding soil, and usually appear completely white or slightly brownish in colour (Arcini 2005, Gejvall 1948, 155; 1961; Herrmann 1972, Lisowski 1968, 78). The bones in the burials would therefore indicate that they were separated from pyre remains before being placed within their respective pits.

4.3 **Bone fragmentation**

The degree of bone fragmentation in cremation burials has in the past been explained by factors such as pyre collapse, ground pressure, frost-action and archaeological excavation (see Lisowski 1968, 79; McKinley 1989, 72), or it has been taken as an indicator that the bones were crushed after the burning and prior to burial (Holck 1997, 35; Kaliff 1992; Sigvallius 1994, 33; Wegewitz 1972, 169). None of these factors are mutually exclusive and a robust explanation would posit that bone fragmentation is likely to be a result of a

combination of those mentioned above, alongside other factors such as the sex and age of the individual, other weather conditions (besides just frost-action), pyre technology and so on (Geber 2003).

The different degrees of fragmentation of cremation burials within and between different geographical and climatic zones could be an indicator of cultural and/or chronological differences in the burial practise. It has for instance been noted that the degree of fragmentation of cremation burials in Ireland often is less than their equivalents in Britain (Lisowski 1968, 79).

Although the bones from the burials in this analysis were very fragmented, the uneven quantity between the three burials makes it difficult to determine whether any deliberate crushing of bone has taken place (Table 1.).

4.4 ***Bone quantity***

A modern commercial cremation of an adult individual normally generate around 2–3.5 litres of bone in volume (Gejvall 1948, 157), but it is very rare to find these amounts in an ancient cremation burial. It has been suggested by several archaeologists that the loss of bone quantity between the cremation and the deposition/burial is due to a symbolic selection of bone deemed more suitable for burial or that bone from one and the same cremation were deposited at different locations (Arcini 2005, 63-65).

One must however also consider the practical aspects of collection of bones from a pyre where spongy bones such as vertebrae, pelvic and epiphyseal long bone fragments are easily fragmented into bone dust, especially directly after incineration, and might therefore not have been possible to retrieve. The cremation experiment by Piontek which included an outdoor pyre reconstruction and the cremation of human remains concluded that it was not difficult to find bone fragments from the ashes after the cremation (Piontek 1976), which can indicate that undisturbed cremation burials of a quantity significantly less than what would be expected after a cremation are token deposits.

It can be assumed that much of the quantity in the cremation burials from Kilemly had been lost due to truncation and disturbances caused by ploughing. This is probably also explaining to the variation in quantity seen between the deposits. Skeletal elements from three out of four body regions were identified in burial F19 and all four regions were noted in burial F74, which probably indicate that both were originally complete burials.

5 Summary and conclusion

- 5.1 The cremated bones in three pit burials were analysed (F16, F19 and F74). Human bone could only be positively identified in two burials, deriving from a 50-89 year old (F19) and a 35-64 year old male (F74) individual. The bone in all three features was well burned, indicating successful and effective cremations.

- 5.2 The bones were all very fragmented, possibly indicating that they were manually crushed before deposition. They were also clean to slightly sooty, indicating a pre-depositional treatment of the remains where care probably was taken to separate them out from sooty remains from the pyre construction.

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Catalogue

Abbreviations:

MNI: Minimum Number of Individuals

Cut number: F19
Fill number: F20
Period: Late Bronze Age
Context/Container: Pit
Estimated number of fragments: 2767 (1.01% identified)
Weight: 131.27g (25.76% identified)
Volume: 100ml
Maximal linear fragment size: 35.28mm
Fragmentation category (Wahl 1982): I
Incineration category (Wahl 1982): IV
Colour: White
Clean/Sooty: Clean
Skull: Cranial vault, teeth (14.03g)
Axial: Not present
Upper limb: Distal metacarpal phalanx (0.29g)
Lower limb: Femur, tibia (19.49g)
MNI: 1
Age: 50-89 years (*Older adult*)
Sex: Indeterminable
Pathology: Not present
Metrics (Gejvall 1948) (mm):

	N:	Min.	Mean	Max.	SD
1a	1	-	3.64	-	-
3c	4	5.71	6.57	7.49	0.74

Animal bones: Not present

Cut number: F16
Fill number: F15
Period: Late Bronze Age
Context/Container: Pit
Estimated number of fragments: 198 (0.00% identified)
Weight: 11.80g (0.00% identified)
Volume: <10ml
Maximal linear fragment size: 16.35mm
Fragmentation category (Wahl 1982): I
Incineration category (Wahl 1982): IV
Colour: White
Clean/Sooty: Indeterminable
Species: Indeterminable

Cut number: F74
Fill number: F75
Period: Late Bronze Age
Context/Container: Pit
Estimated number of fragments: 9334 (0.88% identified)
Weight: 654.54g (13.47% identified)
Volume: 550ml
Maximal linear fragment size: 35.72mm
Fragmentation category (Wahl 1982): I
Incineration category (Wahl 1982): V

Colour: White

Clean/Sooty: Slightly sooty

Skull: Cranial vault, sphenoid bone, left temporal bone, parietal bone, frontal bone, left zygomatic, right maxilla, mandible, teeth (77.06g)

Axial: Lumbar vertebra (0.91g)

Upper limb: Left clavicle, radius (2.69g)

Lower limb: Right tibia (7.53g)

MNI: 1

Age: 35-64 years (*Late middle – Older adult*)

Sex: Male? (*mastoid process of the left temporal bone, left superciliary arch of the frontal bone*)

Pathology: Not present

Metrics (Gejvall 1948) (mm):

	<i>N:</i>	<i>Min.</i>	<i>Mean</i>	<i>Max.</i>	<i>SD</i>
<i>1a</i>	17	3.70	4.80	6.66	0.94

Animal bones: Not present

Appendix 1 - Tables

Table 1. The distribution in weight of the general size of the fragments after sieving of cremation burial F15, F20 and F75. Abbreviation: ENF = estimated number of fragments

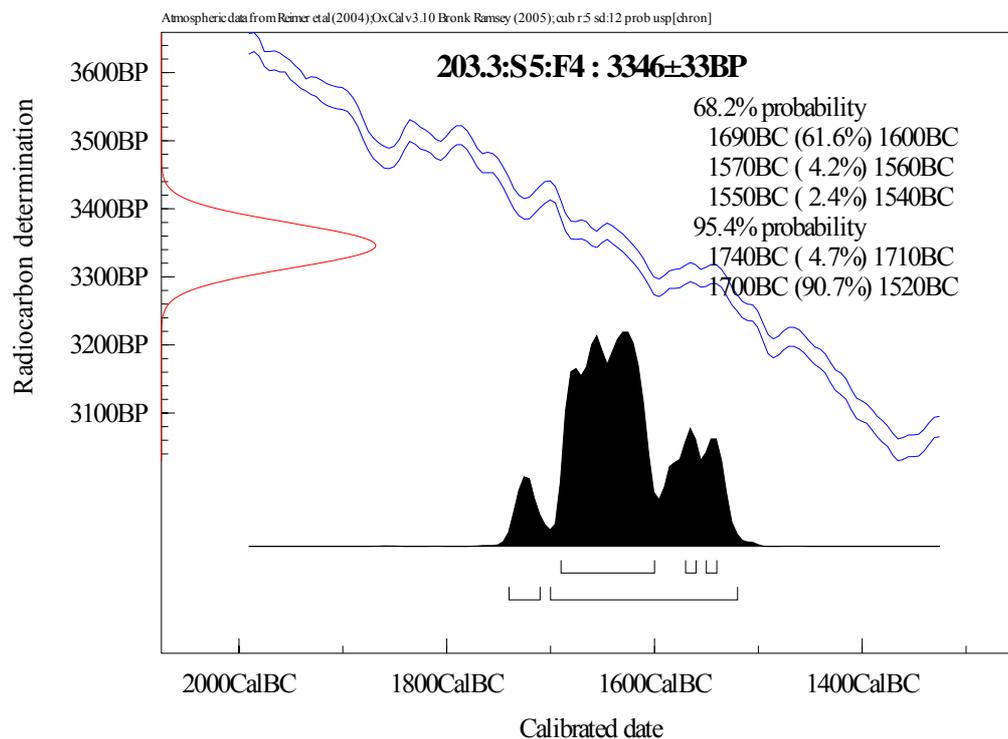
<i>Fill</i>	<i>Sample</i>	<i>Context</i>	<i>Volume</i>	<i>Weight</i>	<i>ENF</i>	<i>> 10mm</i>		<i>5-10mm</i>		<i>2-5mm</i>		<i>< 2mm</i>	
15	8	Pit	< 10ml	11.80g	198	0.00g	-	3.60g	30.51%	7.76g	65.76%	0.44g	3.73%
20	6	Pit	100ml	131.27g	2767	31.25g	23.81%	57.48g	43.79%	39.63g	30.19%	2.91g	2.22%
75	9	Pit	550ml	654.54g	9334	100.00g	15.28%	251.14g	38.37%	252.68g	38.60%	50.72g	7.75%
TOTAL:			650ml	797.61g	2767	131.25g	16.46%	312.22g	39.14%	300.07g	37.62%	54.07g	6.78%

Appendix 10 - Radiocarbon Analysis

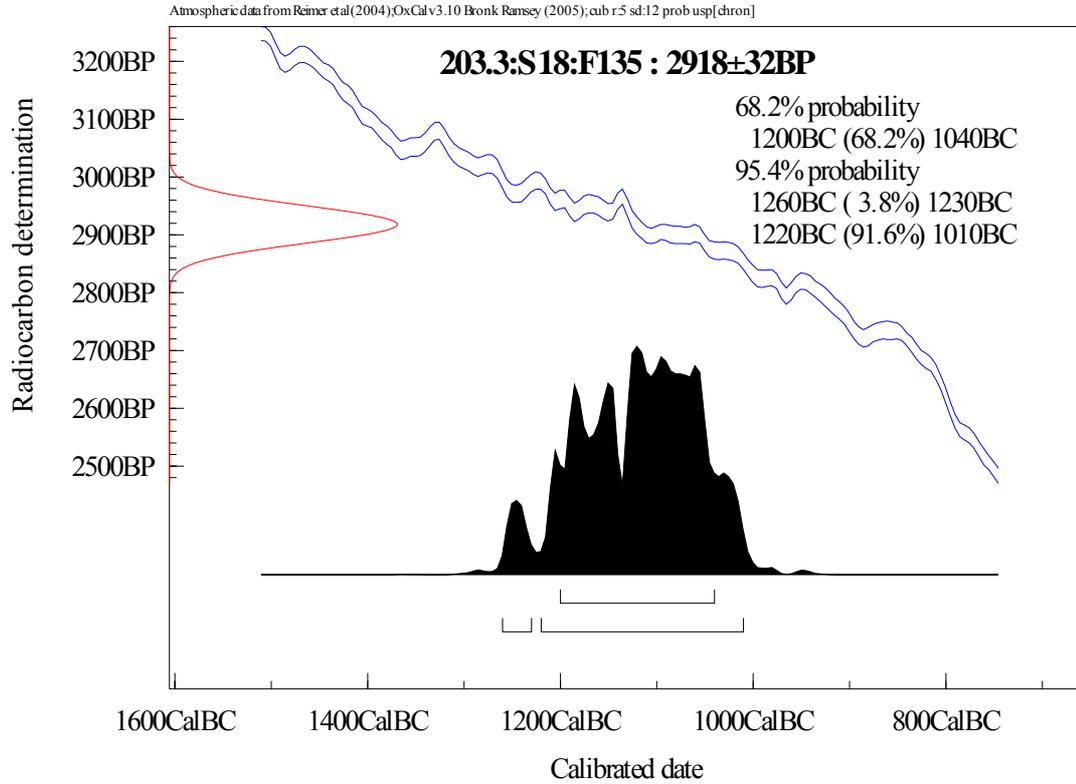
Site	Lab reference	Dated Material	Context	Measured Radiocarbon Age(BP)	Std Dev	13C/12C Ratio (0/00)	2 Std Dev	2 Sigma Calibration
203.3	UB-7205	<i>Corylus</i> (hazel charcoal)	F4	3346	33	-25	66	cal BC 1734-1530 (95.4%)
203.3	UB-7206	<i>Fraxinus</i> (Ash charcoal)	F135	2918	32	-22	64	cal BC 1256-1012 (95.4%)
203.4	UB-7512	cremated human bone	F74	2757	42	-30	84	cal BC 1001-821
203.4	Beta 221187	<i>Quercus</i> (oak charcoal)	F11	2090	40	-26.3	80	cal BC 190- AD 20 (95%)

Calibration curves generated by Oxcal 3

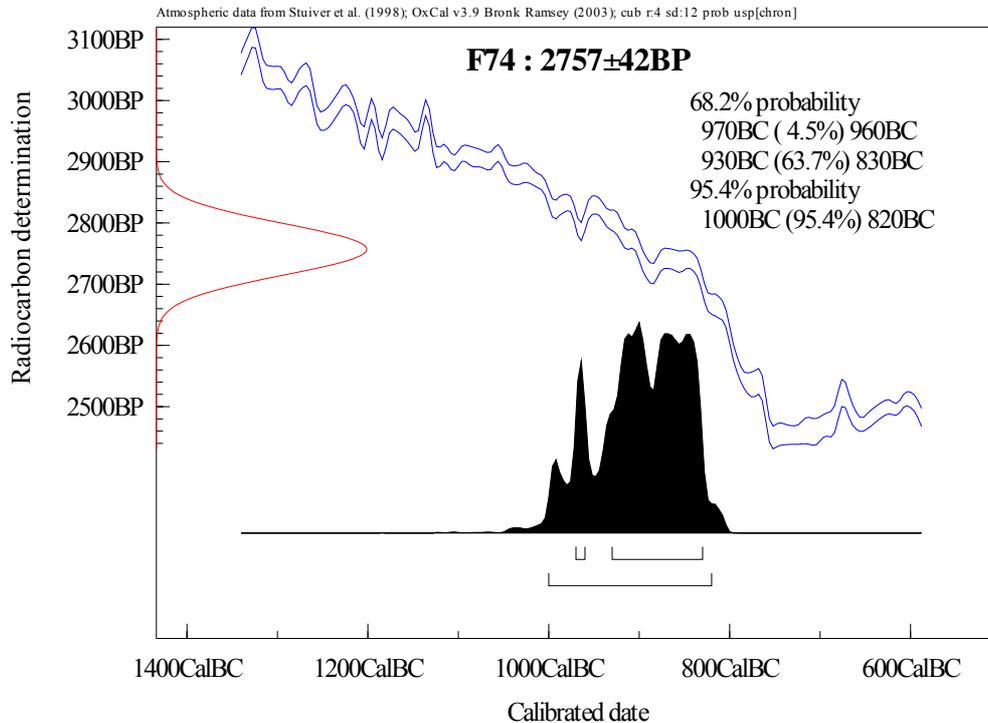
Site 203.3 F4 Fill of hearth on Southeast of Site



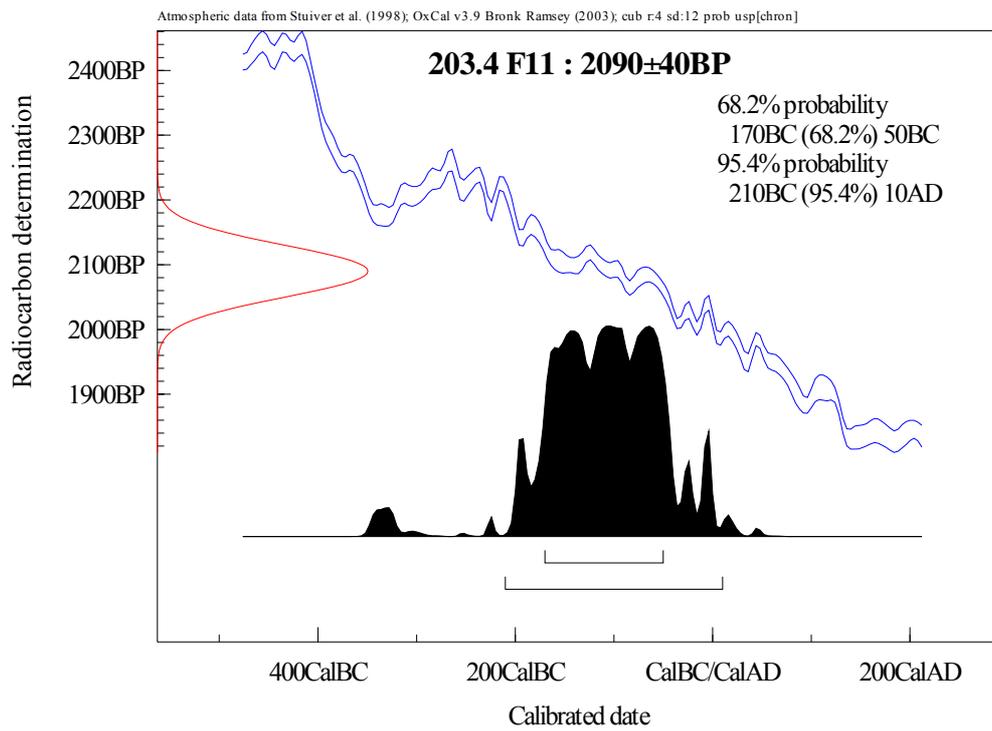
Site 203.3 F135 fill of stake hole associated with hearth F85

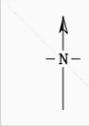
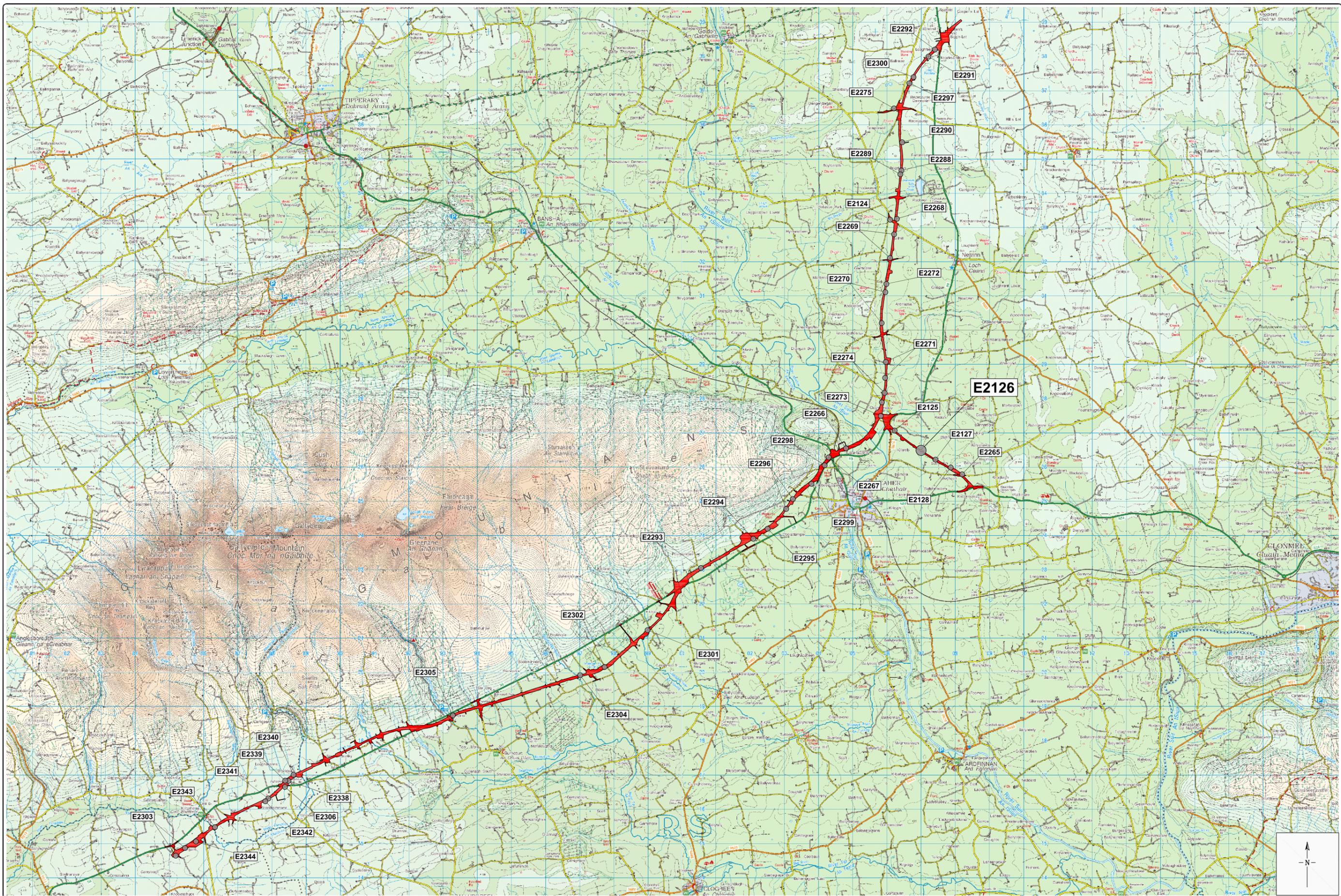


Site 203.4 F74 cremated bone



Site 203.4 F11 fill of cooking pit F12





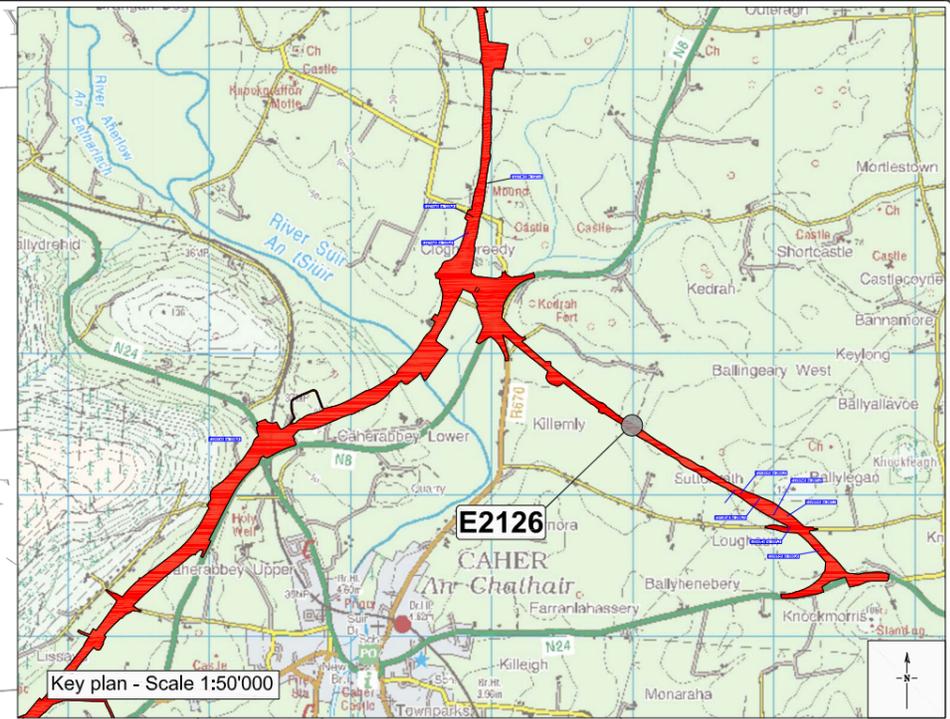
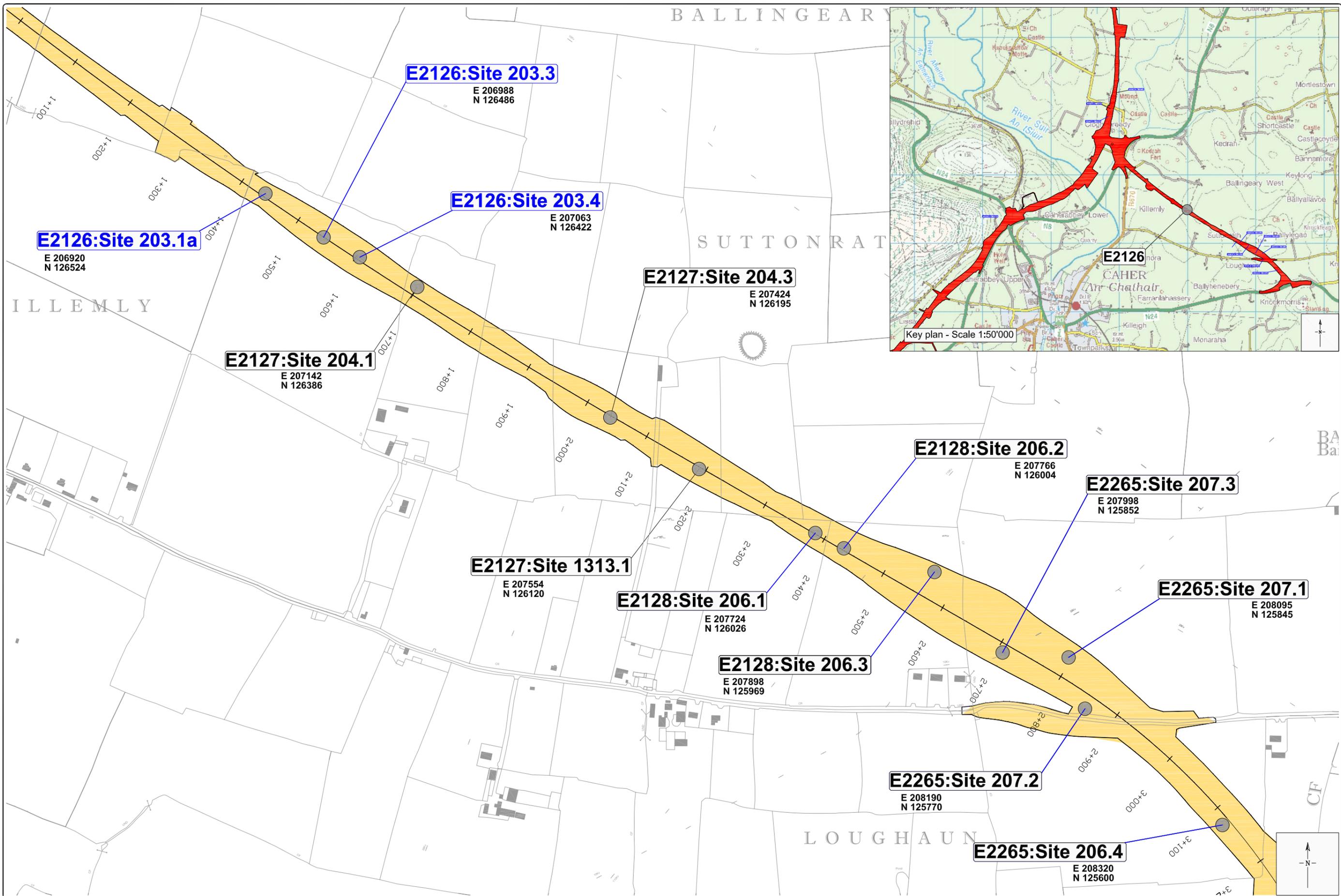
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CHECKED BY: MMQ	DATE ISSUED 26.10.07

PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Route of road and location of excavation sites
CLIENT: South Tipperary County Council

JOB NO: 06038-R63
DRAWING NO.: 06038-003-R63
FIG. NO. 1
SCALE: 1/100000 @ A3

	Margaret Gowen & Co Ltd Archaeological Consultants & Project Managers	27 Merrion Square Dublin 2 Tel: 01-7997200 Fax: 01-7997201 Email: archaeology@mgjarc.com www.mgjarc.com
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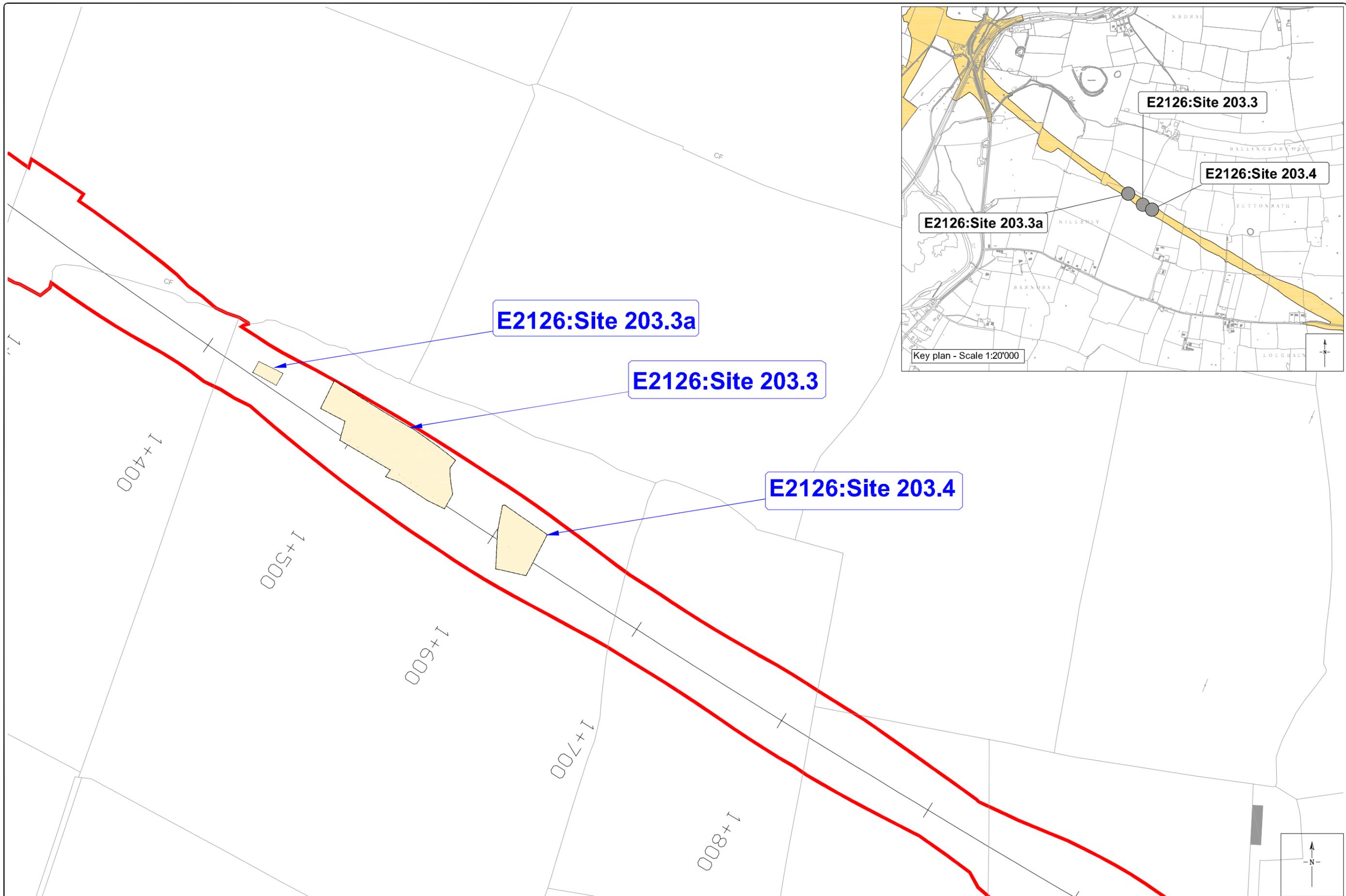
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CHECKED BY: MMQ	DATE ISSUED: 26.10.07

PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Site Locations
CLIENT: South Tipperary County Council

JOB NO.: 06038-R63
DRAWING NO.: 06038-045-R63
FIG. NO.: 2
SCALE: 1/5000 @ A3

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PRODUCED BY: IE, EB, AA, JPR	DATE SURVEYED: N/A
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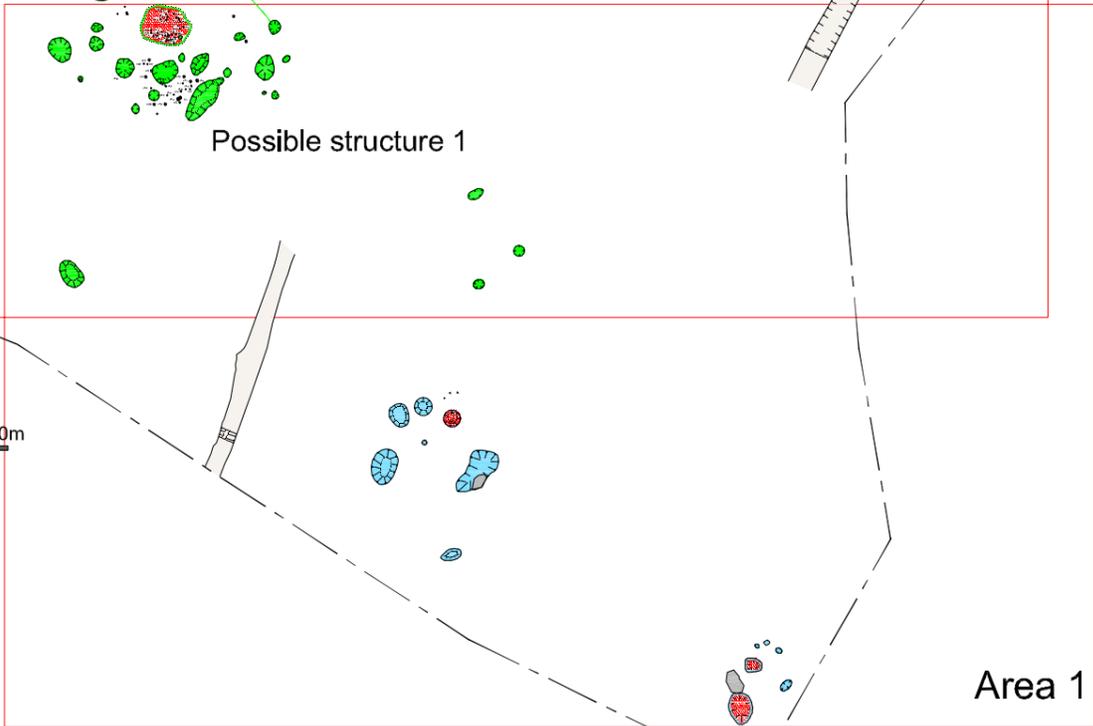
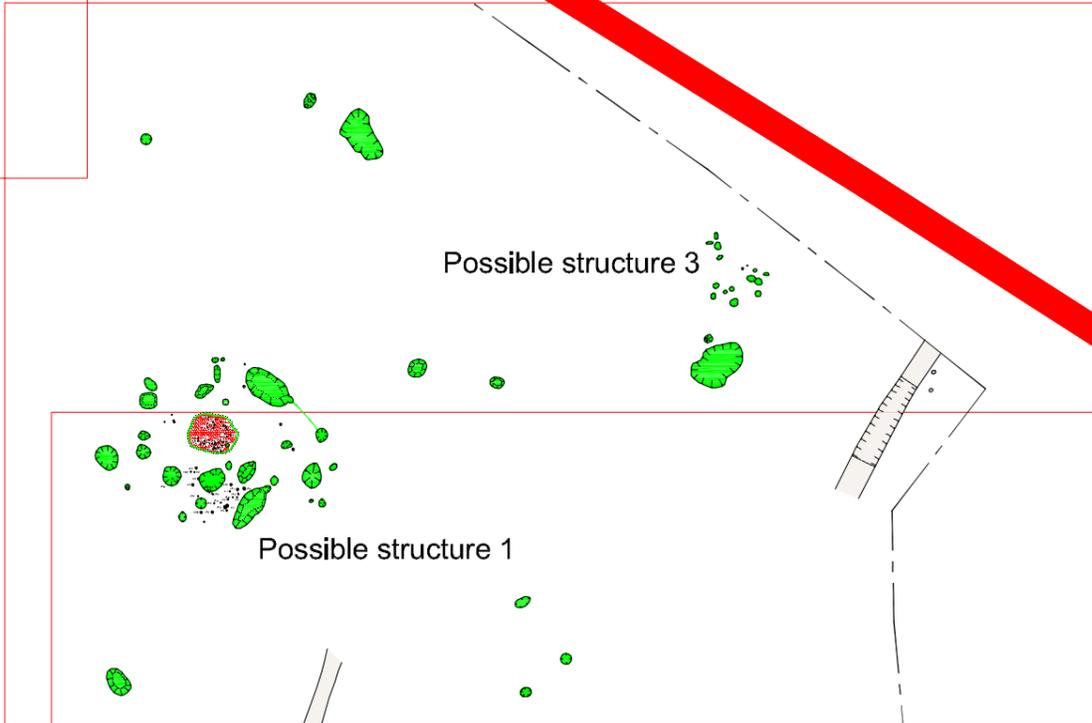
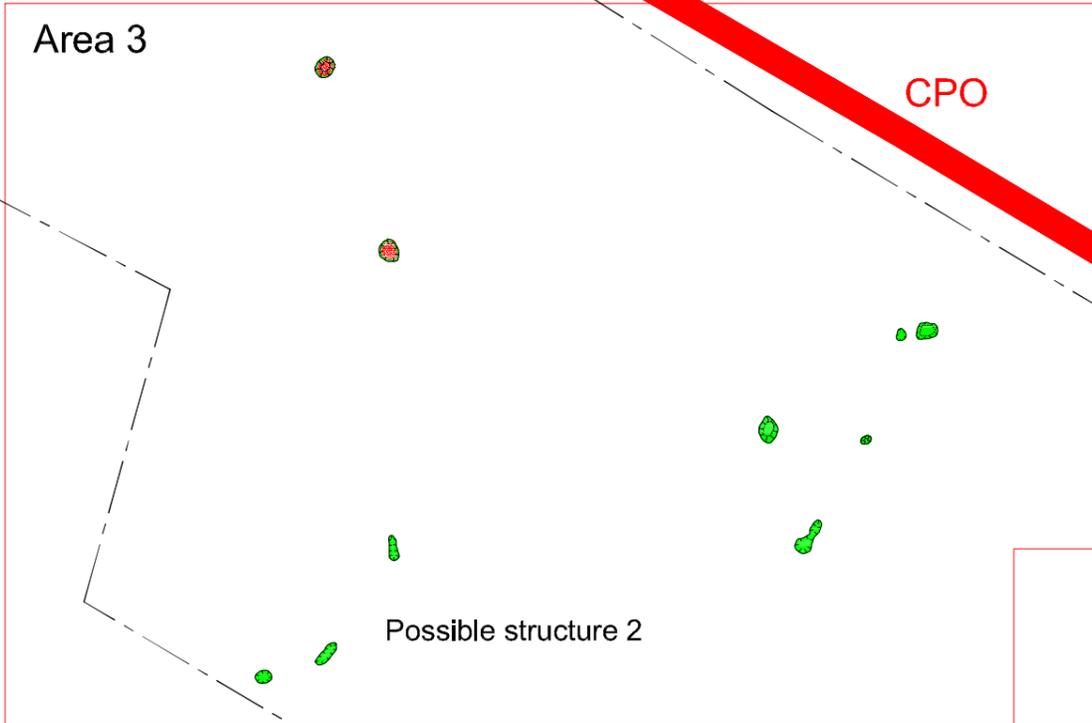
PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Site Locations
CLIENT: South Tipperary County Council

JOB NO: 06038-R63
DRAWING NO: 06038-118-R63
FIG. NO. 3
SCALE: 1/2000 @ A3

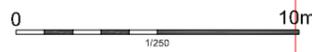


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Excavation No. 2126
Site: 203-3



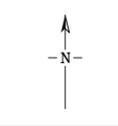
Edge of Excavation



Key to Colours:

- Middle Bronze Age (1700 - 1200BC)
- Late Bronze Age (1200 - 800BC)
- Post-Medieval / Modern
- Scorched ground

Area 1



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CHECKED BY: MMQ	DATE ISSUED: 26.10.07

PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Post-excavation plan, Site 203-3
CLIENT: South Tipperary County Council

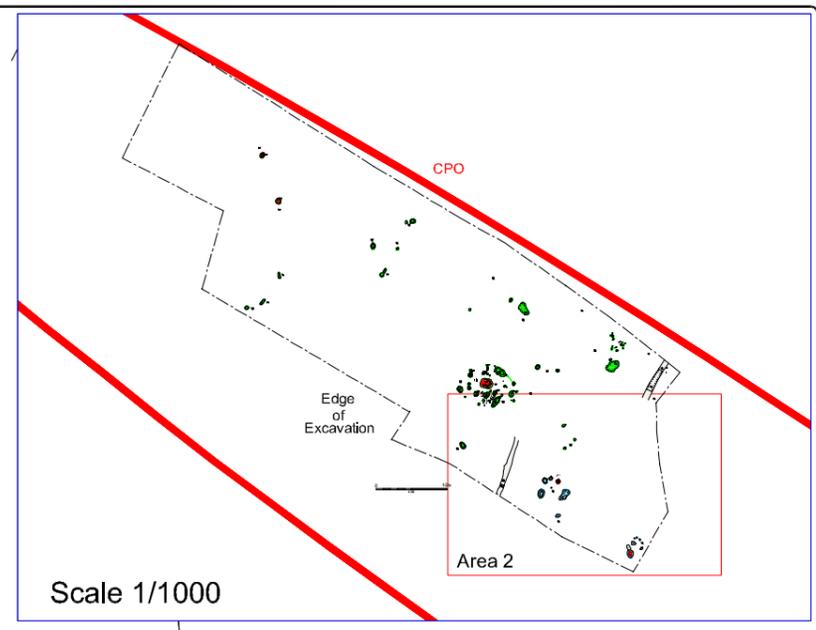
JOB NO: 06038-R63
DRAWING NO: 06038-120-R63
FIG. NO. 4
SCALE: 1/250 @ A3



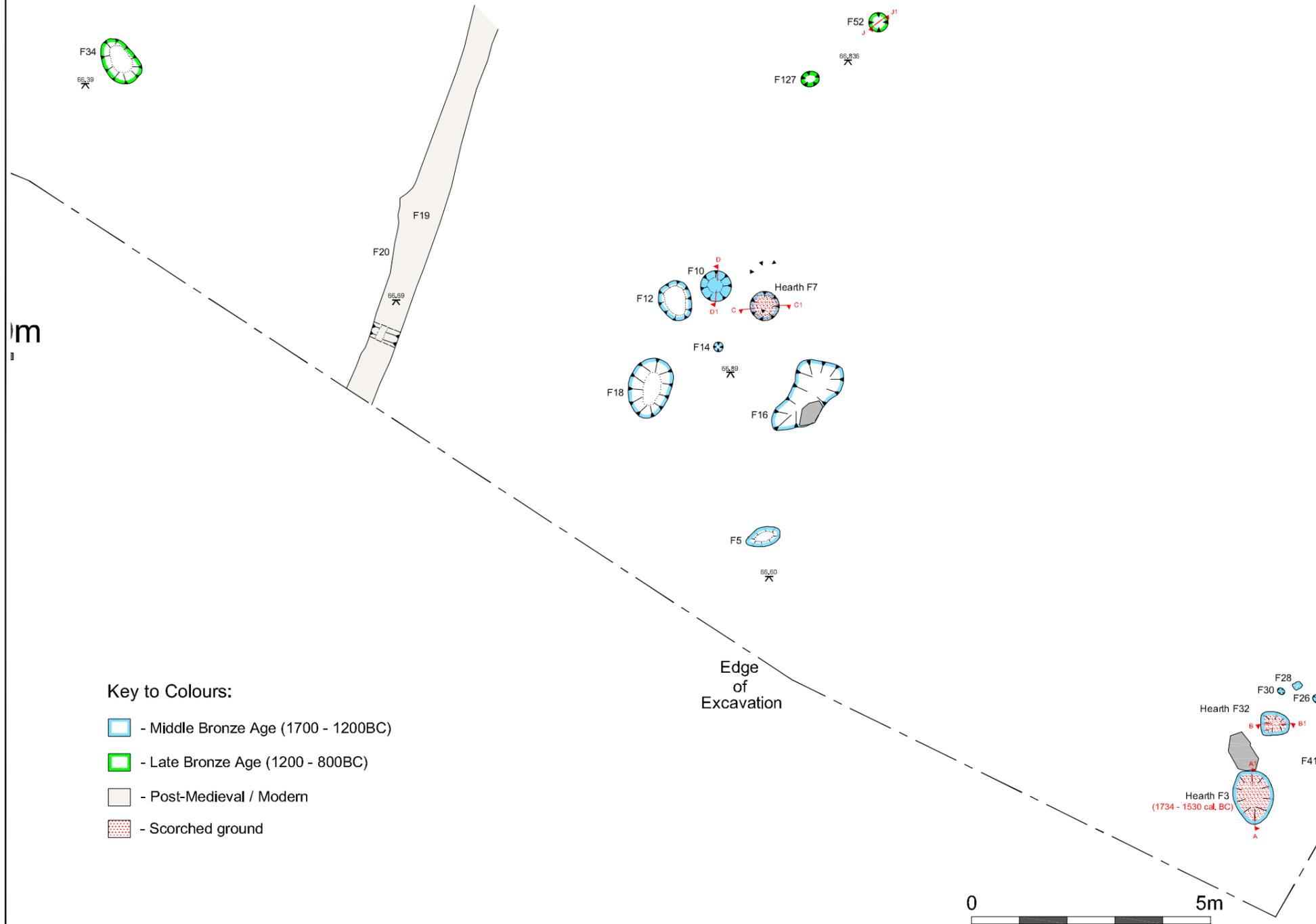
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Excavation No. 2126
Site: 203.3 Area 2

Possible structure 1

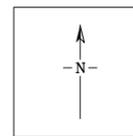


Scale 1/1000



Key to Colours:

- Middle Bronze Age (1700 - 1200BC)
- Late Bronze Age (1200 - 800BC)
- Post-Medieval / Modern
- Scorched ground



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ARCHAEOLOGICAL LICENCE: Scheme No. A035 - E2126	
PRODUCED BY: IE, EB, AA, JPR	DATE SURVEYED: N/A
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PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Post-excavation plan, Site 203-3, Area 2
CLIENT: South Tipperary County Council

JOB NO: 06038-R63
DRAWING NO: 06038-122-R63
FIG. NO. 5
SCALE: 1/100 @ A3



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Excavation No. 2126
Site: 203.3 Area 1

Edge of Excavation

CPO

Edge of Excavation

Area 1

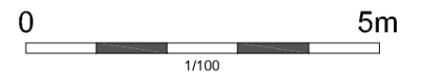
Scale 1/1000

Possible structure 3

Possible structure 1

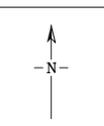
Location of decorated spindle whorl E2126:15

(1256 - 1012 cal. BC)



Key to Colours:

- Middle Bronze Age (1700 - 1200BC)
- Late Bronze Age (1200 - 800BC)
- Post-Medieval / Modern
- Scorched ground



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PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Post-excavation plan, Site 203-3, Area 1
CLIENT: South Tipperary County Council

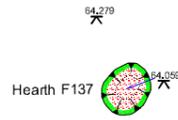
JOB NO: 06038-R63
DRAWING NO: 06038-121-R63
FIG. NO. 6
SCALE: 1/100 @ A3



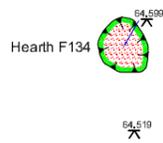
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Excavation No. 2126

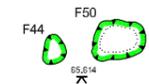
Site: 203.3 Area 3



Hearth F137

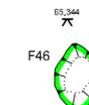


Hearth F134



F44

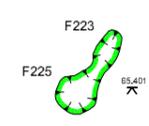
F50



F46



F48K1

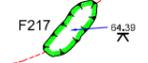


F223

F225



F244



F217



F197

Possible structure 2

Edge of Excavation

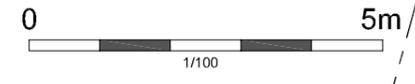
CPO

CPO

Area 3

Edge of Excavation

Scale 1/1000



0

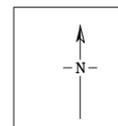
5m

1/100

Key to Colours:

Green outline - Late Bronze Age (1200 - 800BC)

Red hatched area - Scorched ground



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PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Post-excavation plan, Site 203-3, Area 3
CLIENT: South Tipperary County Council

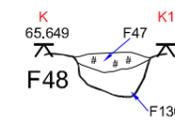
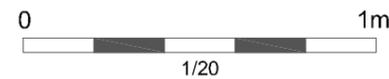
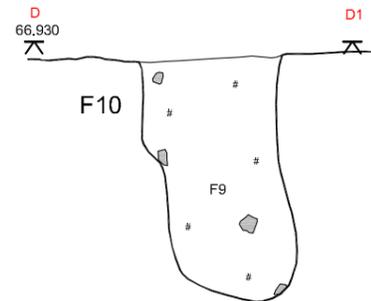
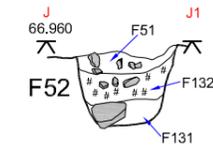
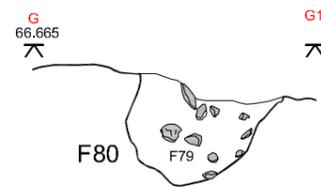
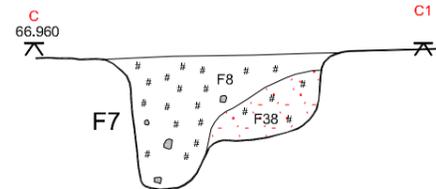
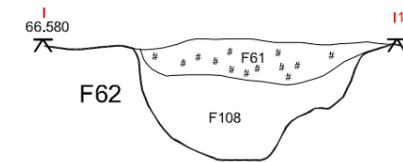
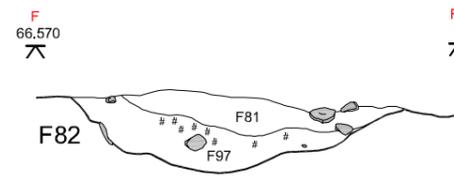
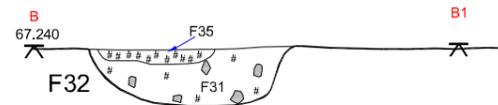
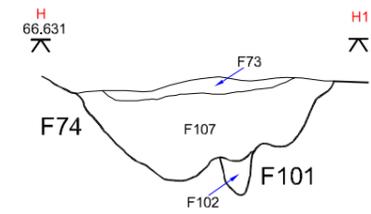
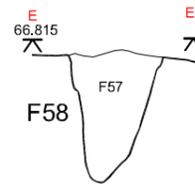
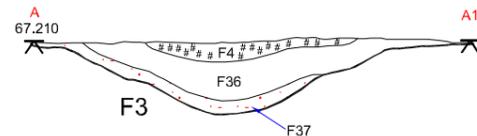
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DRAWING NO: 06038-123-R63
FIG. NO. 7
SCALE: 1/100 @ A3

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Excavation No. 2126

Site: 203.3 Area 3



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DATE ISSUED:	26.10.07

PROJECT:	N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE:	Sections, Site 203-3
CLIENT:	South Tipperary County Council

JOB NO.:	06038-R63
DRAWING NO.:	06038-I23A-R63
FIG. NO.:	8
SCALE:	1/20 @ A3



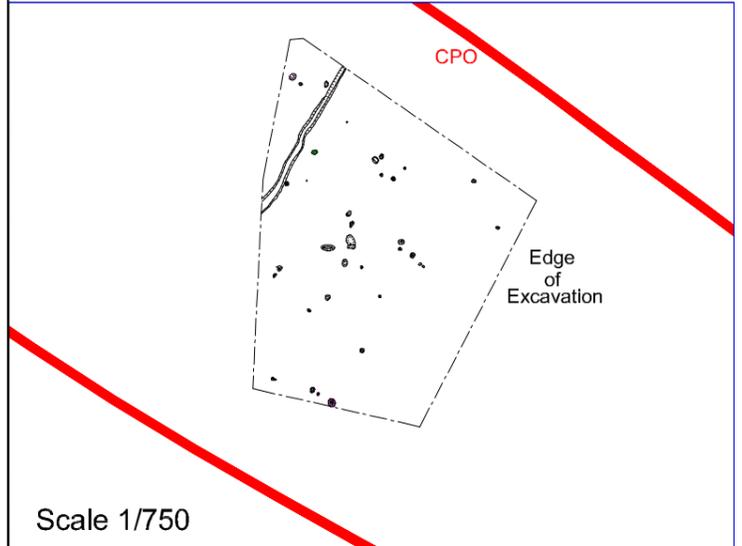
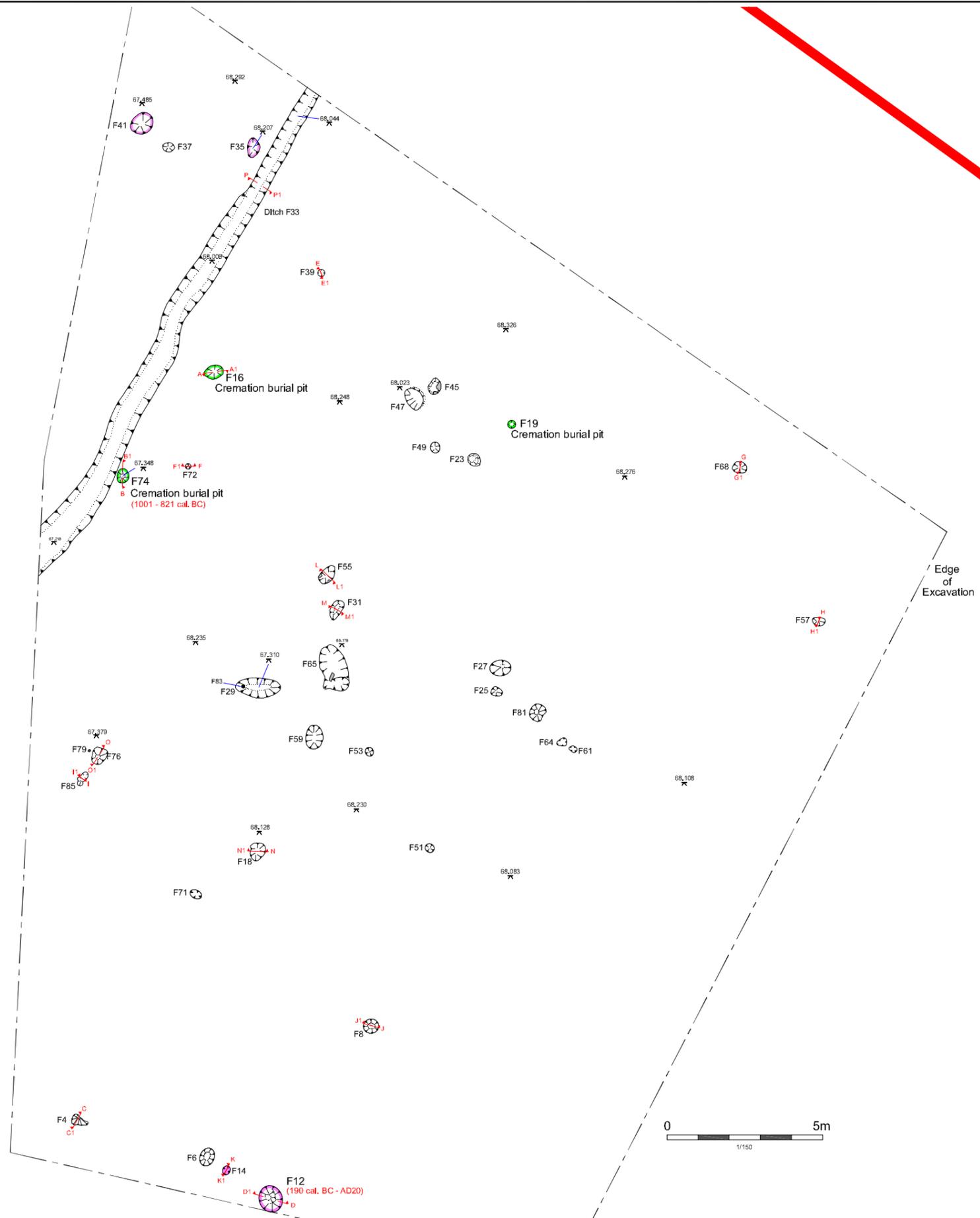
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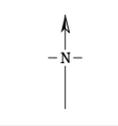
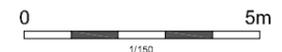
Site: 203.4

Key to Colours:

- Late Bronze Age (1200 - 800BC)
- Iron Age (800BC - AD400)
- Undated Features



Scale 1/750



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PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Post-excavation plan, Site 203-4
CLIENT: South Tipperary County Council

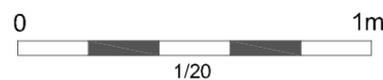
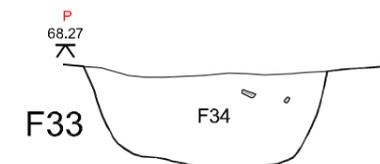
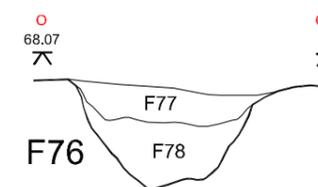
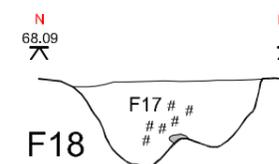
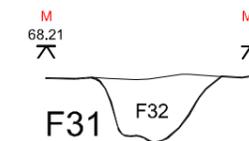
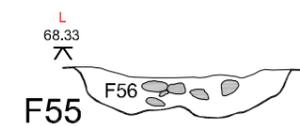
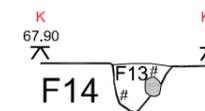
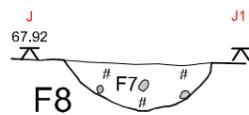
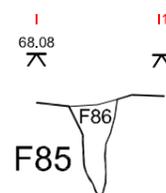
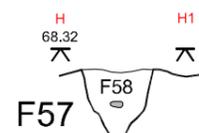
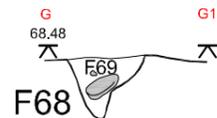
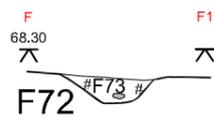
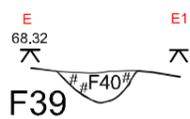
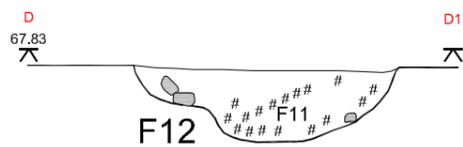
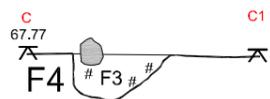
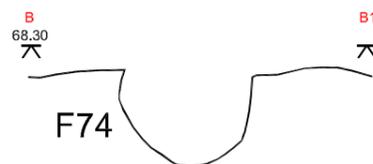
JOB NO: 06038-R63
DRAWING NO: 06038-124-R63
FIG. NO. 9
SCALE: 1/150 @ A3



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Excavation No. 2126

Site: 203.4



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ARCHAEOLOGICAL LICENCE: Scheme No. A035 - E2126	
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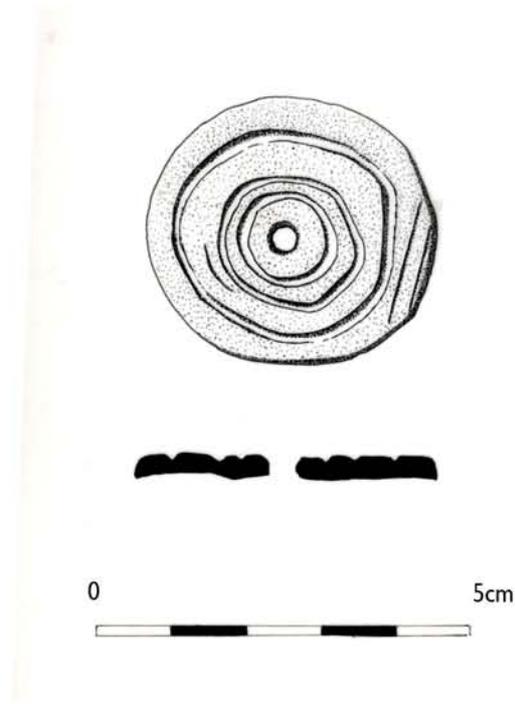
PROJECT: N8 Cashel to Mitchelstown Road Improvement Scheme
TITLE: Sections, Site 203-4
CLIENT: South Tipperary County Council

JOB NO: 06038-R63
DRAWING NO: 06038-124A-R63
FIG. NO. 10
SCALE: 1/20 @ A3



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Site 203.3
E2126:15



Margaret Gowen & Co Ltd
Archaeological Consultants & Project Managers

Job N8/M8 Cashel-Mitchelstown
Co. Tipperary (E2126)
Ref. 06038-R63
Date 23.10.07
Client South Tipperary County Council
Scale As indicated
Fig. 11 Illustration of Stone spindle whorl
E2126:15



Plate 1 Lower view of site 203.3 post-ex



Plate 2 Hearth F3 mid-ex from south



Plate 3 F7 mid-ex



Plate 4 Post-ex of posthole F10 from north



Plate 5 Post-ex of pit F12 from north

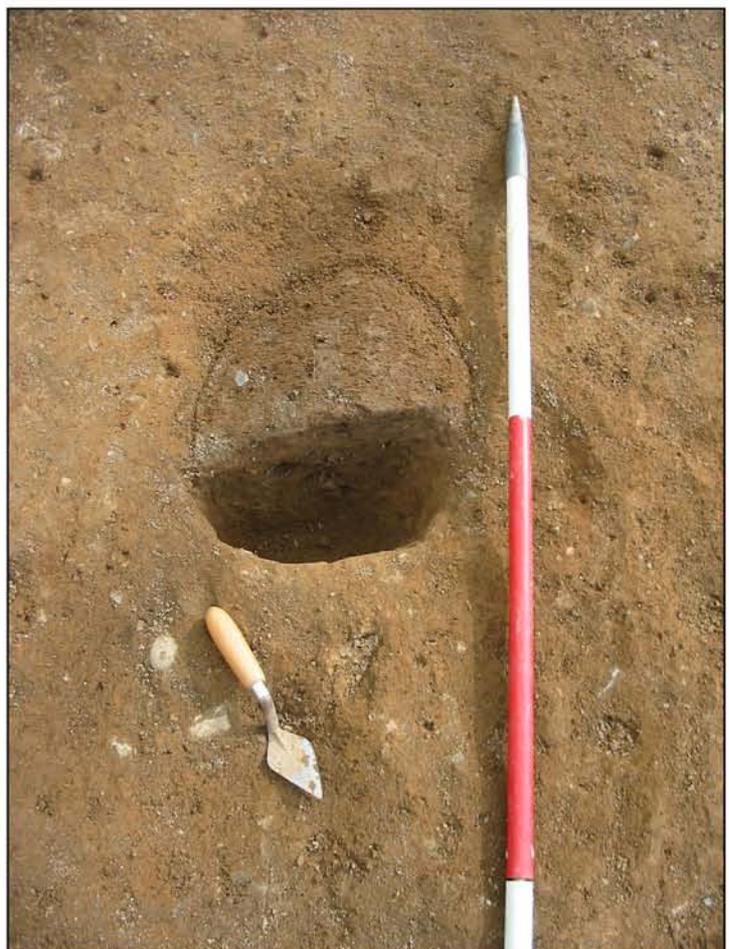


Plate 6 Pit F5 mid-ex from north



Plate 7 Mid-ex of post hole F122 from west



Plate 8 Pre-ex of hearth F85 from west



Plate 9 Post-ex of pit F82



Plate 10 Mid-ex of pit F78 from south



Plate 11 Mid-ex of pit F62 from south



Plate 12 Mid-ex of pit F74 and stakeholes from south



Plate 13 Mid-ex of pit F76



Plate 14 Mid-ex of posthole F201



Plate 15 F206 mid-ex and F116, F1120 post-ex



Plate 16 Mid-ex of pit F84 from south



Plate 17 Mid-ex of pit F157 from south



Plate 18 Mid-ex of pit F52



Plate 19 Pit F236 and postholes on the northern end of the site pre-ex



Plate 20 Excavation in progress Site 203.4, showing landscape setting of site and views to the southwest



Plate 21 Post-ex of cremation burial pit F16 from north



Plate 22 Mid-ex of cremation burial pit F74.



Plate 23 F7, F14 and F12 pre-ex from south



Plate 24 Mid-ex of pit F4I from south



Plate 25 Post-ex of pit F18 from east



Plate 26 Furrow F43, Ditch F33 and pits F41, F35, F35, and F37 post-ex from north



Plate 27 Post-ex of ditch F33 and cremation burial pits F74 and F16 from south



Plate 28 Decorated stone spindle whorl E2126:15 from Site 203.3