M3 CLONEE – NORTH OF KELLS MOTORWAY SCHEME
ARCHAEOLOGICAL SERVICES CONTRACT 4
NAVAN TO KELLS AND KELLS BYPASS

E3125: GRANGE 1
MINISTERIAL DIRECTION REF. NO.: A029/

FINAL REPORT

SUBMITTED TO MEATH COUNTY COUNCIL

04 NOVEMBER 2010

Irish Archaeological Consultancy

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PROJECT DETAILS

Project Reference No.	MH 00 100
Project	M3 Clonee–North of Kells, Contract 4
Ministerial Direction Reference No.	A029
Excavation Registration Number	E3125
Excavation Director	Patricia Lynch
Senior Archaeologist	Shane Delaney
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow.
Client	Meath County Council
Site Name	Grange 1
Site Type	Middle Bronze Age pit, Iron Age/Early Medieval Kiln, Undated Ditch and Metalled Surfaces
Townland	Grange
Parish	Ardbraccan
County	Meath
NGR (Easting)	280215
NGR (Northing)	270195
Chainage	62400
Height m OD	65m OD
RMP No.	N/A
Excavation Start Date	24 July 2006
Excavation Duration	18 days
Report Type	Final
Report Date	04 November 2010
Report By	Patricia Lynch

ACKNOWLEDGMENTS

This final report has been prepared by Irish Archaeological Consultancy Ltd on behalf of Meath County Council and the National Roads Authority in advance of the construction of the M3 Clonee – North of Kells Motorway Scheme. This excavation has been carried out under Ministerial Direction to the Department of Environment, Heritage and Local Government (DoEHLG), in consultation with the National Museum of Ireland issued under Section 14 of the National Monuments Acts 1930–2004.

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ABSTRACT

This is a final report of an archaeological excavation at Grange 1 which was located on the route of the M3 Navan–Kells & Kells Bypass (Archaeological Services Contract 4) of the M3 Clonee–North of Kells Motorway Scheme, County Meath. The excavation was carried out by Patricia Lynch of Irish Archaeological Consultancy Ltd on behalf of Meath County Council and the National Roads Authority. The work was carried out under Ministerial Direction No. A029/007 and National Monuments Service (NMS) Excavation Registration No. E3125 which were received from the DoEHLG in consultation with the National Museum of Ireland. The fieldwork took place between 24 July 2006 – 16 August 2006.

A total area of 1574m^2 was opened around Grange 1 to reveal the archaeological features that were identified at the site during archaeological testing under licence 04E0925.

The site comprised an isolated middle Bronze Age pit (1613–1459 BC), an Iron Age/early medieval kiln (AD 428–549) two undated linear ditches and a series of metalled surfaces.

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1 INTRODUCTION

This report presents the results of the archaeological excavation of Grange 1 carried out in the townland of Grange, Co. Meath (Figures 1–4) as part of an archaeological mitigation program completed under Archaeological Services Contract 4 for the M3 Navan–Kells & Kells Bypass, which forms part of the M3 Clonee–North of Kells Motorway Scheme, County Meath. Archaeological fieldwork was directed by Patricia Lynch of Irish Archaeological Consultancy Ltd (IAC) under Ministerial Direction No. A029/007 and NMS Registration No. E3125. The work described here was funded by the Department of Transport under the National Development Plans 2000–2006 and 2007–2013 as part of the Transport 21 initiative. The total archaeological cost is administered by the National Roads Authority through Meath County Council. Irish Archaeological Consultancy Ltd was appointed by Meath County Council to undertake the works following a public procurement process.

1.1 Background to the Proposed Development

The M3 Clonee–North of Kells Motorway Scheme involves construction of 49km of two-lane, dual-carriageway motorway between Clonee and Kells and 10km of single carriageway from Kells to Carnaross, north of Kells, along with additional road upgrades, realignments and associated ancillary works. For the purposes of the Environmental Impact Assessment and the subsequent archaeological investigations the scheme was subdivided into five separate sections as follows: Clonee to Dunshaughlin (Contract 1), Dunshaughlin–Navan (Contract 2), the Navan Bypass (Contract 3) Navan to Kells (Contract 4) and Kells to North of Kells (Contract 5). This section of the scheme incorporates 11.1km along the N3 Navan–Kells Road and 3.8km of the N52 Kells Bypass.

The archaeological components of the Environmental Impact Statement published in 2002 were carried out by Valerie J. Keeley Ltd (VJK) and Margaret Gowen and Co. Ltd (MGL) in 2000–2001. This included desk based studies and field surveys of each section (VJK – Sections 1 & 3 and MGL – Sections 2, 4 & 5). Additionally on behalf of Margaret Gowen and Co. Ltd geophysical survey was undertaken on the Dunshaughlin–Navan section and at Nugentstown on the Navan–Kells section by GSB Prospection (2000 & 2001). These studies carried out as part of the Environmental Impact Assessment were augmented by further geophysical survey conducted by Bartlett-Clark Consultancy on the remainder of the scheme (2002).

Advance archaeological testing was completed by ACS and Irish Archaeological Consultancy Ltd (IAC) in 2004 (ACS – Sections 1–3 and IAC Sections 4–5). Excavation of the sites identified during testing was conducted by ACS and IAC between 2005 and 2008 (ACS Sections 1–3 & 5 and IAC Section 4).

The archaeological requirements for the M3 Clonee–North of Kells Motorway Scheme are set out in the Archaeological Directions issued to Meath County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930 – 2004 and in the terms of the contract between Meath County Council and Irish Archaeological Consultancy Ltd. These documents form the basis of all archaeological works undertaken for this development. The excavations at Grange 1 were carried out in accordance with the written method statement submitted for approval to the Project Archaeologist and the National Monuments Service and National Museum of Ireland in accordance with the provisions of the Ministerial Directions and the terms of the contract.

All features identified during the assessment phase were subsequently re-identified and the site was fully excavated during the resolution phase of the scheme which took place between 24 July 2006 – 16 August 2006.

Grange 1 was located in the townland of Grange, *c.* 8.5km to the south-east of Kells and *c.* 2km south of the current N3 (County Meath OS sheet 24). The topography from Navan to Kells is generally flat and gently undulating lowland. The area is characterised by a patchwork pattern of high quality agricultural fields as well as developed hedgerows. Grange 1 was located on the south-east corner of a roughly rectangular field which was previously used for rough grazing. The site was situated at *c.* 65m OD.

The site was assigned the following identification data:

Site Name: Grange 1; Ministerial Direction Number: A029; Excavation Registration Number: E3125; Route Chainage (Ch): 62400; NGR: 280215/270195.

1.2 Previous Archaeological Work

1.2.1 EIS

An archaeological assessment of the proposed corridor for Contract 4 of the M3 Navan–Kells & Kells Bypass, which forms part of the proposed M3 Clonee–North of Kells Motorway Scheme was included within an EIS which was published in February 2002 (Gowen 2002). This identified 12 RMP sites that would be directly affected by the proposed road development and highlighted a number of areas of archaeological potential.

The Environmental Impact Assessment (EIA) recorded the following archaeological sites and areas of archaeological potential within 500m of Grange 1:

RMP sites adjacent to the route:

- ME024:007, a possible church site. There is a 19th-century reference to a church at this site, which is said to consist of a squared area defined by an earthen bank *c.* 42m in diameter.

1.2.2 Geophysical Survey

A geophysical survey of the site was undertaken from May to July 2002. The survey phases were as follows:

Phase 1:	Magnetometry of 9m blocks within each 20m strip of ground, giving 45% coverage of each 20m block.
Phase 2:	A magnetic susceptibility reading at 12.5m intervals along the magnetometry transects.

Bartlett-Clark Consultancy undertook a geophysical survey of the test area containing Grange 1 under Licence No. 02R058. Any potential archaeological anomalies worth investigation were highlighted within the report. Test trenches were excavated across geophysical anomalies to assess the extent, character and condition of any such below-ground archaeological remains (see section 1.2.3). In all cases the location of the geophysical trenches were surveyed in by GPS to ensure the accuracy of the testing exercise.

Details of the results are as follows:

Geophysical survey in this area revealed a depression in the readings similar to the ditch seen in the area of Grange 3 – plot 3006A (Bartlett 2002, 8).

1.2.3 Testing

Grange 1 was identified as a result of archaeological assessment undertaken by IAC Ltd. in 2005. Grange 1 was located within Test Area 2 of Contract 4 (Delaney 2005). Testing at site Grange 1 revealed a spread of small stones (0.1–0.2m in diameter), possibly a metalled surface or a path, the date of which is unclear as no artefacts were found (Delaney 2005).

1.3 Methodology

The methodology adopted was in accordance with the approved Method Statement. The topsoil was removed to the interface between natural and topsoil using a 20 tonne mechanical excavator equipped with a flat toothless bucket under strict archaeological supervision across an area measuring 1574m². The remaining topsoil was removed by the archaeological team with the use of shovels, hoes and trowels in order to expose and identify the archaeological remains. A site grid was set up at 10m intervals and was subsequently tied in to the national grid using GPS survey equipment.

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

A complete photographic record was maintained throughout the excavation. Digital photographs were taken of all features and of work in progress. These photographs were supplemented by specialist aerial photography.

An environmental strategy was devised at the beginning of the excavation which consisted of a combination of targeted and random bulk sampling. This ensured that noticeably rich contexts were sampled, but also allowed for samples where environmental remains may not have been obvious. Features exhibiting large amounts of carbonised material such as hearths and pits were the primary targets.

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

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

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

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the M3 Contract 4 excavations.

Mesolithic: 7000–4000 BC
Neolithic: 4000–2500 BC

Early Bronze Age: 2500–1700 BC
Middle Bronze Age: 1700–1200 BC
Late Bronze Age: 1200–800 BC
Iron Age: 800 BC–AD 500
Early medieval period: AD 500–1100
Medieval period: AD 1100–1600
Post-medieval: AD 1600–1800

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

2 EXCAVATION RESULTS

Two phases of archaeological activity were identified at Grange 1: a Bronze Age phase (Phase 1) which was defined by a single pit; and an Iron Age/early medieval phase (Phase 2) which was defined by a cereal-drying kiln. Post-medieval/modern activity was identified (Phase 3) in the form of a drain and furrow. A series of metalled surfaces and a linear ditch could not be dated and may be associated with the perhaps the Bronze Age, the Iron Age/early medieval or other unidentified phase of activity.

2.1 Natural Geology

The overburden in this area of the proposed route consists of stiff silts overlying glacial till. Bedrock is likely to be found *c.* 5 m below ground level and to consist of limestone. Generally, the area surrounding Kells is characterised by relatively low ice marginal ridges, eskers, and kame and kettle topography (Finch *et al*. 1983; Meehan 1996) dominated by sand and gravel units. Overall, this area is very hummocky with some interspersed peat bogs and badly drained hollows (Meehan 1999).

The natural subsoil varied little across this cutting. In general it was brown hard sandy silt that was very stony.

2.2 Phase 1: Bronze Age Pit C30

The earliest dated feature was an isolated Bronze Age pit positioned at the north-west edge of the site.

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C30	N/A	0.38	0.34	0.1	Circular, gradual sides and a flat base.	Cut of pit.
C31	C30	0.38	0.34	0.1	Loose, charcoal-enriched soil, burnt bone.	Fill of pit.

Finds: None

Interpretation:

This sub-circular pit (C30) was filled with C31, a loose, charcoal-enriched soil that contained 50% charcoal and 25% burnt bone, (Figures 5 and 6; Plate 2). Analysis showed that there were 555 indeterminate fragments of bone in this feature. The bone was extremely fragmented and calcined. Nine fragments have been identified as being from a medium-sized mammal, perhaps sheep/goat or pig (McCarthy, Appendix 2.6). This suggests that the feature is not a human cremation pit as was originally stated in the Grange 1 interim report. A sample of this bone (4.3g) from C31 was chosen for AMS dating. The bone returned an AMS result of 3262+/-25 BP (UBA 12939). The 2 Sigma calibrated result for this was 1613–1459 BC (QUB, Appendix 2.7), indicating a date in the middle Bronze Age for this feature.

Charcoal analysis identified 45 fragments of alder (*Alnus* sp.), and a 5 fragments of hazel (*Corylus avellana* sp.) from a sample of C31 suggesting that the main fuel source for the pit was alder (O'Donnell, Appendix 2.4).

2.3 Phase 2: Iron Age/Early Medieval Cereal-Drying Kiln

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C18	C19	2.2	1	0.18	Moderately firm, mid-brown/grey silty clay.	Upper fill of kiln.
C19	N/A	2.2	1	0.32	Sub-oval/ figure of eight-shaped cut.	Cut of kiln.
C32	C19	0.8	0.85	0.1	Loose, dark brown/ black charcoal-rich soil.	Fill of kiln.
C33	C19	0.89	0.87	0.04	Red/orange clay, heat-shattered stones.	Basal fill kiln.

Finds: None.

Interpretation:
Cereal-drying kiln C19 was defined by a sub-circular cut that contained three distinct fills. Fill C18 consisted of a moderately firm, mid-brown/grey silty clay that contained 25% charcoal inclusions and moderate small stone inclusions (Figures 5–6; Plate 3). Fill C32 was a lens within fill C18 that consisted of a loose very dark brown/black charcoal-enriched soil. These in turn overlaid the basal fill of the kiln (C33) which was red/orange in colour and contained heat-shattered stones. This indicated *in situ* burning. Samples from each of the fills of this kiln were sent for plant remains analysis. Large quantities of barley (*Hordeum* sp.) grains (450 in total) were recovered from C18, the upper fill, as well as eight oat (*Avena* sp.) grains, 12 knotgrass (*Polygonum* sp.) grains and a number of unidentifiable grains. Secondary fill C32 contained a small quantity of barley and oat grains as well as more unidentifiable grains (Lyons, Appendix 2.5).

This substantial assemblage conforms that this feature was used for cereal drying. A sample of barley grains (<0.1g) from C32 was chosen for AMS dating. The grain returned an AMS result of 1562+/-25 BP (UBA 11129). The 2 Sigma calibrated result for this was AD 428–549 (QUB, Appendix 2.7), indicating a date in the Iron Age/early medieval period for this kiln.

Charcoal analysis of the sample of C18 of also identified a mixture of 21 fragments of hazel (*Corylus avellana* sp.), 15 fragments of ash (*Fraxinus* sp.), 11 fragments of oak (*Quercus* sp.) and low volumes of pomaceous (*Maloideae* sp.), elm (*Ulmus* sp.), willow (*Salix* sp.), birch (*Betula* sp.) and alder (*Alnus* sp.) (O'Donnell, Appendix 2.4).

Three indeterminate fragments of calcined bone were also found in C18 (McCarthy, Appendix 2.6) may have been intrusive.

2.4 Undated Field Ditch and Metalled Surfaces

A linear field ditch and five metalled surfaces were recorded which were not securely dated and may be associated with either the identified Bronze Age or Iron Age/early medieval phases, or possibly a separate phase of activity.

2.4.1 Linear Field Boundary C9

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C9	N/A	N/A	2	0.7	Linear ditch sloping sides, irregular base.	Cut of ditch.
C10	C9	*c.* 33	1.23	0.31	Firm, dark brown to greyish sandy silt.	Fill of ditch.
C11	C9	*c.* 33	2.2	0.6	Moderately firm fill consisting of silty clay.	Fill of ditch.
C24	C9	2.25	2	0.25	Loose grey sand with no inclusions.	Fill of ditch.

Finds: None

Interpretation:
Cut C9 was a linear field ditch/boundary that measured 0.7m in depth and 2m in width and bisected the site (Figures 5–6; Plate 5). C10 was a loose to moderately firm, dark brown to grey sandy silt that had inclusions of small to moderately sized stones (0.01–0.1m in diameter) and was the fill of the northern part of the ditch. Fill C11 was a moderately firm silty clay that was light brown to yellowish in colour and had inclusions of small stones (0.01–0.05m in diameter), that was in parts the upper fill, and in other parts the basal fill of the ditch. Near the southern end fill C24 consisted of a loose grey sand with no inclusions. To the south of the feature the sides broadened and became shallower, giving a Y-shaped appearance. A small,

almost circular, deposit of cobbles, C20 (Plate 4), underlay layer C10 at the southern part of the ditch (Cf. Section 2.4.4). This deposit in turn overlaid layer C11.

2.4.2 Linear Ditch C12

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C12	N/A	5	1.7	0.4	Linear ditch, sloping sides, uneven base.	Cut of linear ditch.
C13	C12	N/A	1.7	0.3	Loose fill consisting of silty sand.	Primary fill of ditch.
C21	C12	1.25	1	0.15	A loose, light brown sandy fill.	Basal fill of ditch.

Finds:

Context	Find Number	Material	Period	Description
C13	E3125:13:1	Flint	Prehistoric	Retouched flint tool.

Interpretation:

Ditch C12 contained two distinct fills, C13 and C21 (Figure 5). A single flint fragment was recovered from the fill C13. A metalled area (C7) possibly representing ground stabilization or a regular work surface, overlaid the fills and therefore post-dated this ditch. The relationship between the ditch and other features on site was unknown as was its date. The flint piece was chronologically un-diagnostic (Nelis, Appendix 2.2).

2.4.3 Metalled Surfaces

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	4.8	2.5	0.08	Regular shaped stones.	Metalled surface.
C5	N/A	7	2.5	0.05	Deposit of regular shaped stones.	Metalled surface.
C7	N/A	6	3.75	0.12	Irregular spread of stony material.	Metalled surface.
C8	N/A	3	3	0.2	Sub-oval, irregular regular shaped stones.	Metalled surface.

Finds: None

Interpretation:

Four metalled surfaces (C3, C5, C7 and C8) were uncovered that possibly represented ground stabilization or regular work surface (Figures 5 and 6; Plates 6–9). Metalled surface C3 measured 4.8m x 2.5m, was 0.08m deep and consisted of a single layer of stones. Metalled surface C5 measured 7m x 1.25–2.5m and 0.05m deep. C7 measured 6m x 3.75m and was 0.12m deep. It consisted of a single layer of stones and extended beyond the limit of excavation to the south. C7 overlay linear ditch C12 and linear field boundary C9. Metalled surface C8 also consisted of a single layer of stones and measured 3m x 3m and was 0.2m deep. A small amount of charcoal was recovered from this surface.

2.4.4 Metalled Surface within Linear Field Boundary

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C20	C9	1.39	0.9	0.05	Almost circular deposit of cobbles.	Metalled surface.

Finds: None

Interpretation:

A small, almost circular, deposit of cobbles (C20) was sealed by layer C10 in the southern part of the linear field boundary C9 (Figure 5), and overlay layer C11. This indicates that C9 pre-dated the metalled surface C20. This metalled surface was probably associated with C3, C5 and C8.

2.4.5 Charcoal Spread

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C25	N/A	2	2	0.02	Roughly circular spread of charcoal flecks.	Spread.

Finds: None

Interpretation:
A small circular spread of charcoal-rich clay (C25) was identified in the north-east corner of the excavation cutting. The association of this charcoal spread and the other archaeological features was not established.

2.5 Phase 3: Post-Medieval/Modern Agricultural Activity

2.5.1 Field Drain and Furrow

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C14	N/A	5	1.08	0.56	Concave sides and a U-shaped base.	Cut of modern field drain.
C15	C14	5	1.08	0.56	Compact, medium brown sandy silt.	Basal fill of field drain.
C16	N/A	3.6	0.49	0.1	Linear, rounded corners, sharp sides.	Agricultural furrow.
C17	C16	3.6	0.49	0.1	Mid-brown/yellow sandy silt.	Fill of agricultural furrow.
C23	C14	N/A	1.2	0.27	Compact, brown/ grey silty fill.	Upper fill of field drain.

Finds: None

Interpretation:
Short linear agricultural furrow (Figures 5 and 6) was located 0.5m to the north of kiln C19. The fill of the furrow was a mix of topsoil and subsoil.

Linear field drain C14 (Figures 5 and 6) cut through the south-western corner of the site and contained two distinct fills (C15 and C23). This field drain was probably associated with the agricultural furrow C16. A single fragmented cow tooth was recovered from C14 (McCarthy, Appendix 2.6).

2.5.2 Topsoil

Contexts:

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	N/A	N/A	0.3	Grey/brown silt and sandy topsoil.	Topsoil.

Finds:
All finds were recovered from the interface between the natural subsoil and the topsoil.

Context	Find Number	Material	Period	Description
C1	E3125:1:1	Ceramic	18–19th Century	Pottery. Painted pearlware. Teacup.
C1	E3125:1:2	Ceramic	Modern	Pottery. Creamware. Plate/ dish.
C1	E3125:1:3	Stone	Unknown	Hone/polishing stone.
C1	E3125:1:4	Ceramic	13–14th Century	Pottery. Meath-type ware.
C1	E3125:1:5	Ceramic	13–14th Century	Pottery. Meath-type fine ware.
C1	E3125:1:6	Ceramic	18–19th Century	Pottery. Painted pearlware. Teacup.
C1	E3125:1:8	Iron	Unknown	Iron nail.
C1	E3125:1:9	Ceramic	Modern	Pottery. Stoneware. Jar.
C1	E3125:1:10	Stone	Unknown	Unworked stone fragment.
C1	E3125:1:11	Chert	Unknown	Unworked chert shatter.
C1	E3125:1:12	Stone	Unknown	Possible polishing stone.

Context	Find Number	Material	Period	Description
C1	E3125:1:13	Stone/Fossil	Prehistoric	Ammonite fossil possibly used as bead.
C1	E3125:1:14	Ceramic	18–19th Century	Pottery. Red earthenware heavily abraded.
C1	E3125:1:15	Ceramic	13–14th Century	Pottery. Meath-type fine ware.
C1	E3125:1:17	Clay	Late 19th Century	Tobacco pipe bowl.
C1	E3125:1:18	Flint	Prehistoric	Flint flake.
C1	E3125:1:19	Iron	Modern	Whittle tanged knife blade.

Interpretation:

The topsoil was a hard grey/brown silt and sandy mix that overlay the entire site. A range of artefacts were recovered from the topsoil. An ammonite fossil (Figure 7) may have been used as a bead (O'Brien, Appendix 2.3.2) while a flint flake appeared to be a waste piece from knapping (Nelis, Appendix 2.2). A range of medieval and post-medieval pottery were also recovered (Doyle, Appendix 2.1) as well as a modern whittle tanged knife blade (Mac Dermott, Appendix 2.3.1) and a late 19th Century piece of a tobacco pipe (Norton, Appendix 2.3.3). Two honestones/polishing stones were recovered from topsoil. These items are a common feature of tool assemblages in the early medieval/medieval period. One of the pieces (E2125:1:3) had linear striations and gouges suggesting that it was used for sharpening (Nelis, Appendix 2.2).

3 SYNTHESIS

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

3.1 Landscape Setting

The topography from Navan to Kells is generally flat and gently undulating lowland. The area is characterised by a patchwork pattern of high quality agricultural fields as well as mature hedgerows. The River Tolka and its tributaries drain much of southern part of County Meath. The Blackwater drains most of north Meath, flowing just east of Kells and is fed by a number of significant tributaries such as the Moynalty River and Yellow River.

The geology of Meath consists of solid and glacial geology. The solid geological formations are mostly of Palaeozoic age dating between 545–290 million years ago (Finch *et al*. 1983, 9). The solid geology of the area through which the road traverses is dominated principally by carboniferous limestone, which provides the basis for the nourishing, calcium-rich pastures that are seen throughout much of County Meath. The outcome of geological activity from other periods can be seen in the Namurian shales, which form a number of the hills in the area, such as the Hill of Tara and Skreen, and the Ordovician and Silurian shale and sandstones, which form the underlying geology of Kells and the surrounding area.

The overburden in this area consists of stiff silts overlying glacial till. Bedrock is likely to be found *c.* 5 m below ground level and to be limestone. Generally, the area surrounding Kells is characterised by relatively low ice marginal ridges, eskers, and kame and kettle topography (Finch *et al*. 1983; Meehan 1999) dominated by sand and gravel units. Overall, this area is very hummocky with some interspersed peat bogs and badly drained hollows (Meehan 1999).

The overlying soils of County Meath are mostly classified as grey-brown podzolics which are good all-purpose, well drained soils used for both arable and pastoral farming. The overlying soil of the Kells area is brown earths, which are well-drained, mature soils which are generally ideally suited to arable farming. A detailed survey of the soils of County Meath is provided by Finch *et al*. (1983).

Grange 1 was located at 65m above sea level in a relatively flat square shaped field of pasture. The field was bounded on all four sides by mature hedgerows. The north-western boundary also forms part of the townland boundary between Grange and Phoenixtown. The site was located in the south-east corner of the field. A third class road was located *c.* 150m to the north. The general relief of the area was flat or gently sloping and contemporary Bronze Age and early medieval sites may have been visible from Grange 1 including Grange 3. Mature hedgerows however obstruct the visibility. There are several early medieval recorded monuments in the vicinity of Grange 1.

3.2 The Archaeological Landscape – Bronze Age and Iron Age/Early Medieval

As part of the general research relating to sites along the scheme and the specific research relating to Grange 1, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record

of monuments and places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the M3 scheme. The excavated archaeology at Grange 1 has been identified as being Bronze Age and Iron Age/early medieval in date.

3.2.1 General Bronze Age Landscape of the Scheme

Activity dating to the Bronze Age period (2500–800 BC) along Contract 4 of the M3 Clonee–North of Kells Road Scheme was represented in the form of funerary and settlement activity.

Funerary Activity

Bronze Age funerary sites occur throughout Co. Meath. Ring-ditches and barrows are a common feature of the Bronze Age, 48 of which are listed as recorded monuments in the county. A cluster of such monuments occurs at the Tara complex, to the south of Navan, in the townlands of Castletown Tara and Castleboy, and barrows are recorded at Kilmainham (ME017:020) and Commons of Lloyd (ME016:014) to the west of Kells. Additional barrows recorded within the vicinity of Contract 4 of the M3 Clonee–Kells Road Scheme include those at Hurdlestown (ME017:028) and Ardbraccan (ME024:013). Barrows are located to the north-west at the Loughcrew complex. Two ring-ditches dating to the Bronze Age were excavated on Contract 4 of the M3 Clonee–Kells Road Scheme. At Grange 3 a large ring-ditch was established in the middle Bronze Age (1372–1131 BC) and re-cut in the late Bronze Age (974–828 BC). Four cremation pits were also excavated at the site and are likely to be contemporary with this Bronze Age monument (Kelly 2010b). At Kilmainham 3 (Whitty 2010b), close to recorded monument ME017:020 (possible barrow), an early Bronze Age ring-ditch was tentatively identified (2137–1965 BC). Bronze Age pottery was also recovered from a number of sites. The types of pottery consisted of cinerary urns and included cordoned urns, vase urns and a fine bipartite vase that was recovered from Phoenixtown 3 (Lyne 2010b). In addition to this a cordoned urn recovered from Kilmainham 1C (Walsh 2010) has been identified as a possible disturbed burial. The remainder of the Bronze Age vessels, although they are most commonly associated with burial, have been associated with domestic use.

Settlement Activity

Settlement sites dating to the Bronze Age period along Contract 4 of the M3 Clonee–Kells Road Scheme have recovered substantial evidence for Bronze Age houses. As part of the excavations for Contract 4 of the M3 Clonee–North of Kells Road Scheme Bronze Age structures were excavated at Grange 3 (Kelly 2010b), Nugentstown 1 (Structure 3: 1186–978 BC; Lynch 2010b), Phoenixtown 3 (Structure 1: 1503–1415 BC – 1435–1303 BC; Lyne 1010b), Cakestown Glebe 2 (Structure 1: 1122–939 BC and 993–838 BC, Structure 2: 1215–1013 BC; Lynch 2010a), Kilmainham 1A (Structure 3: 1436–1314 BC – 1419–1269 BC; Lyne 2010a), and Town Parks 3 (late Bronze Age structure: 1019–906 BC; Gleeson 2010). In addition to these two small ‘D shaped’ structures were excavated at Cookstown Great 3 (McLoughlin 2010) dated to the early Bronze Age and some small Bronze Age huts were identified at Kilmainham 1C (Walsh 2010).

Burnt Mound Activity

As part of the archaeological investigations conducted in advance of the construction of the M3 Clonee–North of Kells Road Scheme 41 sites exhibiting evidence for hot stone technology were excavated (O’Connor 2007, 2). In addition to these, burnt mound activity was present at 15 of the sites excavated along Contract 4 of the scheme. Nine of these have been identified as dating to the Bronze Age.

The funerary and settlement activity excavated along Contract 4 of the M3 Clonee–North of Kells Road Scheme has uncovered additional elements of Co. Meath's Bronze Age heritage and further contributes to our knowledge and understanding of these communities.

3.2.2 General Iron Age Landscape of the Scheme

A small number of features dating to the Iron Age period (800 BC–AD 500) were excavated in advance of Contract 4 of the M3 Clonee–North of Kells Road Scheme. This primarily comprised of industrial activity including metalworking furnaces and cereal-drying kilns while possible funerary evidence in the form of two ring-ditches was also identified. Within the wider landscape there are important Iron Age foci, most notably Tara. The Tara complex dates as far back as the Neolithic and includes the passage tomb known as the Mound of the Hostages. The site was occupied throughout prehistory as a place of burial and ritual and continued in use into the Iron Age when it became the seat of the high Kings of Ireland. The complex served as a Royal site during the Iron Age and consisted of a hilltop enclosure known as Ráth na Rígh (Roche 2002). This site played a major political and ceremonial role in Ireland during this period.

Notable important sites dating to the Iron Age that have been excavated in Co. Meath include the double banked earthwork at Teltown (Waddell & O'Brien 1998); which is located approximately 3km east of Nugentstown, significantly close to the Contract 4 excavations. Kells has been recognised in the Iron Age as a *dun* settlement. However it is also believed that it is more likely that a prehistoric *dun* was located on the Hill of Lloyd, immediately west of the town, where a trivallate ringfort (ME017:054) is positioned. The location of the Contract 4 M3 Road-Scheme excavations coincides with the location of an old thoroughfare in the region. Kells is located along an ancient route-way known as the Slí Assail. The Slí Assail is one of five Slíte or main highways which, according to the Annals of the Four Masters, all led to Tara (Geissel 2006, 9). This road travelled on an east–west axis from Drogheda towards Rathcroghan (Geissel 2006, 10).

Settlement and Industrial Activity

Along Contract 4 of the M3 Clonee–Kells Road Scheme Iron Age activity was identified at the multi-phase site of Kilmainham 1C (Walsh 2010) in the form of a ditch, and cereal-drying kilns. A pit also dating to the Iron Age was excavated at nearby Kilmainham 2 (Bayley 2010b) (2 Sigma cal 510–387 BC) and further evidence of rural industrial activity was excavated at Grange 3 (Kelly 2010b) in the form of a furnace pit and associated pits. Similarly, extensive metalworking activity was also excavated at Grange 2 (Kelly 2010a) (possible shaft furnace: 2 Sigma cal AD 257–409 and 427–554). Pits of unknown function were excavated at Cookstown Great 1 (Lynch 2010c) and a posthole at Kilmainham 3 (Whitty 2010b) has also been dated to this period (2 Sigma cal 51 BC–AD 52). A waterhole associated with burnt mound activity was excavated at Cookstown Great 3 (McLoughlin 2010) and returned an early Iron Age date; however Bronze Age dates were also recorded at the site indicating a continuity of use of these features over a long time span. Additional Iron Age industrial activity was excavated along Contract 1, 2, 3 & 5 of the M3 Clonee–North of Kells Road Scheme in Co. Meath. Kilns and bowl furnaces were excavated at Dunboyne 2 (O'Hara 2009a) and a bowl hearth was uncovered at Ballinter 1 (Linnane 2008b). A middle Iron Age metal working area was recorded at Rath Hill 1 (Elder & O'Hara 2009) and iron working features were excavated at Chapelbride 1 (Danaher & Ginn 2008). Kilns, pits and hearths were excavated at Johnstown 2 (Schweitzer & Ginn 2008a), kilns dating to the late Iron Age/early medieval period were excavated at Skreen 3 (O'Neill 2009) and some activity including a kiln dating to this period, was uncovered at Pace 1 (Elliott, Clarke & Ginn 2008). A series of large

enclosures and associated features dating to the Iron Age were recorded at Garretstown 2 (Rathbone 2009) and pits including ephemeral features also dating to this period were excavated at Roestown 4 (Linnane 2008a), Kennastown 2 (Martin 2009a) and Macetown 1 (Martin 2009b).

3.2.3 Early Medieval Industrial and Domestic Activity

Early medieval metalworking was recorded at Grange 3 (Kelly 2010b), and Grange 2 (Kelly 2010a) and kilns were excavated at Gardenrath 2 (Bayley 2010a), Kilmainham 1A (Lyne 2010a), Grange 3 (Kelly 2010b) and at Kilmainham 1C (Walsh 2010) where eleven figure of eight cereal drying kilns dating to the Iron Age and early medieval period were recorded. Some ephemeral activity in the form of pits was also excavated at Cookstown Great 3 (McLoughlin 2010).

Pits, kilns and metal working activity was recorded along the M3 Clonee–North of Kells, Contract 1, 2, 3 & 5 at Bennetstown 1 (Elliott & Ginn 2008), Pace 1 (Elliott, Clarke & Ginn 2008), Castlefarm 1 (O'Connell & Clark 2009), Berrillstown 1 (Rathbone 2009), Blundelstown 1 (Danaher 2009), Clowanstown 3 (Mossop 2008), Chapelbride 4 (O'Hara, Gallagher & Ginn 2009), and Pottlebane 3 (Gallagher, Ginn & Kelleher 2008). A field system and well were also excavated at Merrywell 1 (O'Connell & Ginn 2009) and some ephemeral activity dating to the early medieval period was excavated at Pottlebane 1 (Rathbone & Ginn 2008).

3.2.4 Archaeological Landscape of Grange 1

Two phases of activity were identified at Grange 1, a middle Bronze Age (1613–1459 BC) phase represented by an isolated pit and an Iron Age/early medieval phase (AD 428–549) represented by a cereal-drying kiln. The remaining features which included a linear ditch and a number of metalled surfaces were undated.

Contemporary early Bronze Age activity was recorded in the immediate area of Grange 1. Evidence of Bronze Age settlement in the area is strong with the discovery of a major middle Bronze Age settlement which includes two middle Bronze Age houses (1499–1415 BC and 1408–1269 BC) located *c.* 500m to the south-east at Grange 3 (Kelly 2010b). Middle Bronze Age activity was also recorded at the adjacent Grange 4 site, *c.* 350m to the south-east (Duffy 2010). This site also had evidence of early Neolithic and late Neolithic features. Further to the north-west middle Bronze Age settlement was identified at Phoenixtown 3 (Lyne 2010b) which included a round house (earliest date: 1503–1415 BC, latest: 1435–1303 BC).

Evidence of Iron Age–early medieval settlement in the Grange area is also strong. Metalworking furnaces (191–5 BC, 346–60 BC), a possible enclosure ditch (AD 617–666) and cereal-drying kilns (AD 427–570) were all identified at Grange 3 (Kelly 2010b). Immediately west of this site at Grange 2 a possible shaft furnace dating to AD 257–409, AD 427–554 was identified (Kelly 2010a). This site also had earlier Iron Age metalworking features (369–202 BC) and a late Iron Age/early medieval grave yard (AD 424–568, AD 431–571, AD 432–591).

There were a number of recorded archaeological monuments within the general vicinity of Grange 1 (Figure 2). All of these other recorded monuments date from the early medieval period or later demonstrating a continuity of settlement in the area stretching over several millennia.

3.3 Summary of the Excavation Results

The principle features at Grange 1 were the isolated Bronze Age pit (C30: 0.38m x 0.34m x 0.1m) which was filled with charcoal-rich clay and burnt bone and the sub oval/figure-of-eight kiln (C19: 2.2m x 1m x 0.32m). The linear ditch (C9) traversed the

site and measured *c.* 41m long, 2m wide and max 0.7m deep.

I addition to these there were four distinct metalled surfaces (C3: 4.8m x 2.5m x 0.08m; C5: 7m x 2.5m x 0.05m; C7: 6m x 3.75m x 0.12m; and C8: 3m x 3m x 0.2m).

3.4 Summary of the Specialist Analysis

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

Medieval and Post-Medieval Pottery

The pottery assemblage from Grange 1 comprises three sherds of 13th–14th century locally produced medieval pottery and five fragments of post medieval pottery ranging in date from the 18th–19th century. All finds were recovered from the topsoil (Doyle, Appendix 2.1).

Lithic Analysis

The Grange 1 assemblage comprised a small chipped stone assemblage, including two flint and one chert artefacts, as well as a small assemblage of ground stone artefacts; with the exception of one item all ground and chipped stone artefacts were found in topsoil. (Nelis, Appendix 2.2).

Small Finds Analysis

Metal

Two iron objects were recovered from topsoil, a nail and a knife. The nail was badly corroded and was probably modern while the knife was likely to be late post-medieval or relatively modern. (Mac Dermott, Appendix 2.3.1).

Bead

One possible stone bead was identified which measured 9mm in diameter, 2mm in thickness and the perforation was 3mm wide. O'Brien notes that this object probably represented an ammonite and could have been utilised as a bead. (O'Brien, Appendix 2.3.2).

Clay Pipe

One clay pipe was recovered from topsoil. This was a late 19th century bowl fragment. (Norton, Appendix 2.3.3).

Charcoal Analysis

Charcoal was examined from two contexts (C18 the fill of Iron Age/early medieval Kiln C19 and C31 the fill of Bronze Age pit C30). Eight wood taxa were identified, including hazel (*Corylus avellana*), oak (*Quercus* sp.), ash (*Fraxinus* sp.), elm (*Ulmus* sp.), willow (*Salix* sp.), pomaceous fruitwood (Maloideae spp.), alder (*Alnus* sp.) and birch (*Betula* sp.). The results are dominated by alder, followed by hazel. (O'Donnell, Appendix 2.4).

Analysis of Plant Remains

Four samples associated with deposits from kiln C19 (C18 and C32) were selected for archaeobotanical analysis. The carbonised plant remains assemblage contained predominantly barley with much lesser oat and wild taxa, in the form of *Polygonum* sp. (knotgrass) seeds. These crops are typical of a medieval cereal assemblage. (Lyons, Appendix 2.5).

Animal Bone Analysis

Over 97% of the bones from the site came from a single isolated pit (C30) of Bronze Age date. The sample consisted of 542 extremely fragmented and calcined bone and none of these can be identified to species. Nine fragments were sufficiently large to indicate that they derived from a medium-sized mammal, perhaps sheep/goat or pig. The remainder of the sample was indeterminate. In addition to this small fragments of burnt bone were recovered from the kiln and a cow tooth was retrieved from the linear field ditch C9. (McCarthy, Appendix 2.6).

Radiocarbon Dating

Two AMS dates were obtained for the site. A middle Bronze Age date (1613–1459 BC) was established for a pit (pit C30) while an Iron Age/early medieval date was obtained for a cereal-drying kiln (C19: AD 428–549) (QUB, Appendix 2.7).

3 DISCUSSION AND CONCLUSIONS

4.1 Discussion

Two phases of archaeological activity were identified at Grange 1: a middle Bronze Age pit and an Iron Age/early medieval cereal-drying kiln. A series of metalled surfaces and a linear ditch which traversed the site were undated and may be contemporary with either phases or may represent a separate/undated phase of activity. The presence of medieval pottery in the topsoil may be an indication that there is a medieval site in the vicinity of Grange 1.

Phase 1: The significance of the site in the middle Bronze Age landscape

The Bronze Age pit is relatively insignificant in isolation but is a small part of a much larger Bronze Age landscape which includes contemporary middle Bronze Age settlement at Grange 3 *c.* 500m to the south-east and Phoenixtown 3 *c.* 1.7km to the north-west. Grange 3 had both settlement and funerary components which included two middle Bronze Age houses, possible cremation pits and a ring-ring which was in use in the middle Bronze Age and re-used in the late Bronze Age while a middle Bronze Age roundhouse was identified at Phoenixtown 3. The evidence from these sites suggests that there was an established Bronze Age population in the area from the middle Bronze Age onwards. Grange 1 was a small component, but part of, this wider archaeological landscape.

Phase 2: The significance of the site in the Iron Age/early medieval landscape

The cereal-drying kiln at Grange 1 is also a small part of a more extensive Iron Age/early medieval landscape which includes the contemporary metalworking and cereal-drying features at Grange 2 and 3. These features are likely to be peripheral components of Iron Age/early medieval settlement in the general area, small elements of which were perhaps identified at Grange 3 in the form of a possible enclosing ditch which returned a date of AD 617–666. The cereal-drying kilns at Grange 3 were 'figure of eight' kilns one of which was dated to AD 427–570, contemporary with the date established for kiln C19 at Grange 1. The Grange 1 kiln was also contemporary with the shaft furnace identified at Grange 2 (AD 428–549).

Cereal-drying kilns – function and form

Cereal-drying kilns were used for a variety of purposes, but were mostly related to the drying of cereals and other crops, and in Ireland the two basic purposes for which they were constructed seem to have been to dry grain and to harden it prior to grinding (O'Sullivan and Downey 2005, 32). The Irish 'corn-drying kilns' are frequently keyhole or dumb-bell shaped (*ibid. 33*). The basic kiln would comprise four main structural components: a *bowl*; *flue*; *stoke-hole*; and *drying platform* (*ibid.*). A fire would have been set at the *stoke hole* (which was either a natural depression or cut) at the mouth of the *flue*. This would be where the fire was burned to effect the drying (*ibid.*). The *flue* extends from the *bowl/drying platform*. The *drying platform* overlay the *bowl* and typically consisted of heavy timber supports overlain with wattles, carrying a layer of straw and/or straw mat, through which the heat was able to pass through from below to the grain/cereal (*ibid.*).

The surrounding environment in the Bronze Age and Iron Age/early medieval period

Through charcoal analysis it was possible to deduce that Grange 1 was located close to a mosaic of different woodland types when the site was in use, including canopy, shrub/scrub and wet woodlands.

4.2 Conclusions

The site at Grange 1, while small in scale, is an important part of a larger Bronze Age and Iron Age/early medieval landscape. This represents, in the Iron Age/early medieval period, small-scale peripheral industry of perhaps, as yet, unidentified contemporary settlement in the wider area.

5 BIBLIOGRAPHY

5.1 References

Bartlett, A.D.H. 2002 Report on Archaeogeophysical Survey 2002, Section 3: Navan to Kells and Kells Bypass.

Bayley, D. 2010a E3145 Gardenrath 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Bayley, D. 2010b E3143 Kilmainham 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Danaher, E. & Ginn, V. 2008 E3172 Chapelbride 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Danaher, E. 2009 E3075 Blundelstown 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Delaney, S. 2005 *Report on Testing Area 2, Contract 4, M3 Clonee–North of Kells*. Unpublished report prepared for Irish Archaeological Consultancy.

Duffy, C. 2010 E3122 Grange 4 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Elder, S. & O'Hara, R. 2009 E3040 Rath Hill 1. Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Elliott, R. & Ginn, V. 2008 E3025 Bennetstown 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Elliott, R., Clarke, L. & Ginn, V. 2008 E3031 Pace 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Finch, T.F., Gardiner, M.J., Comey, A. and Radford, T. 1983 *Soils of County Meath*. Dublin, An Foras Talúntais.

Gallagher, D., Ginn, V. & Kelleher, G. 2008 E3179 Pottlebane 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Geissel, H. 2006 *A Road on the Long Ridge; in search of the Ancient Highway on the Esker Riada.* CRS Publications, 7–14.

Gleeson, C. 2010 E3149 Town Parks 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Gowen, M. 2002 *M3 Clonee–North of Kells Dunshaughlin–Navan, Environmental Impact Statement*.

Harbison, P. 1992. *Guide to the National and Historic Monuments of Ireland*. Dublin: Gill and Macmillan.

Kelly, A. 2010a Site E3124 Grange 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Kelly, A. 2010b Site E3123 Grange 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Kilfeather, A. 2002 *M3 Clonee–North of Kells Dunshaughlin–Navan, Environmental Impact Statement Vol 6C*, Appendix G.

Linnane, S. 2008a E3046 Roestown 4 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Linnane, S. 2008b E3083 Ballinter 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Lynch, P. 2010a E3158 Cakestown Glebe 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Lynch, P. 2010b E3136 Nugentstown 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Lynch, P. 2010c E3137 Cookstown Great 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Lyne, E. 2010a E3141 Kilmainham 1A Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Lyne, E. 2010b E3130 Phoenixtown 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Martin, K. 2009a E3094 Kennastown 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Martin, K. 2009b E3100 Macetown 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

McLoughlin, G. 2010 E3139 Cookstown Great 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Meehan, R *Directions of ice flow during the last glaciation in counties Meath, Westmeath and Cavan,* Teagasc, Kinsealy Research Centre, Dublin.

Mitchell, F. and Ryan, M. 1997 *Reading the Irish Landscape*. Dublin: Townhouse.

Mossop, M. 2008 E3066 Clowanstown 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Connell, A. & Ginn, V. 2009 E3051 Merrywell 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Connell, A. & Clark, A. 2009 E3023 Castlefarm 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Connor, E. 2007 *Fulacht Fiadh*, Burnt Mounds and Hot Stone Technology on the M3. Unpublished Report. Archaeological Consultancy Services, Louth.

O'Hara, R. 2009a E3034 Dunboyne 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Hara, R. 2009b E3068 Collierstown 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Hara, R., Gallagher, D. & Ginn, V. 2009 E3169 Chapelbride 4 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Neill, T. 2009 E3073 Skreen 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

O Ríordáin, S. P. 1995 *Antiquities of the Irish Countryside*. London, Methuen.

O'Sullivan, M. and Downey, L. 2005 Corn Drying Kilns. *Archaeology Ireland* **19**, 32–35.

Rathbone, S. & Ginn, V. 2008 E3181 Pottlebane 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Rathbone, S. 2009 E3062 Berrillstown 1 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Roche, H. 2002 Excavations at Ráith na Ríg, Tara, Co. Meath. *Discovery Programme Report* **5**, 19–82

Schweitzer, H. & Ginn, V. 2008 E3042 Johnstown 2 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Sweetman, D. (ed) 1987 *Archaeological Inventory of County Meath* Office of Public Works.

Waddell, J. 1998 *The Prehistoric Archaeology of Ireland*. Galway, Galway University Press.

Waddell, J. & O'Brien, M. 1998 The Knockans (Teltown), Oristown, Co. Meath In I. Bennett (ed.) 1998 *Excavations 1997: Summary Accounts of Archaeological Excavations in Ireland*. Bray: Wordwell.

Walsh, F. 2010 E3140 Kilmainham 1C Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

Whitty, Y. 2010 E3144 Kilmainham 3 Final Report. Unpublished Final Report. National Monuments Service, Department of the Environment, Heritage and Local Government, Dublin.

5.2 Other Sources

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

Topographical Files of the National Museum of Ireland, Kildare Street, Dublin 2.

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description
C1	N/A	N/A	N/A	0.3	Topsoil.	Grey/brown silt and sandy topsoil.
C2	N/A	N/A	N/A	N/A	Natural subsoil.	Brown hard sandy silt, very stony.
C3	N/A	4.8	2.5	0.08	Metalled surface.	Sub-oval, irregular deposit of regular shaped stones. Possibly related to C5, C7, C8, C20.
C4	N/A	N/A	N/A	N/A	Non-archaeological.	N/A
C5	N/A	7	2.5	0.05	Metalled surface.	Sub-oval, irregular deposit of regular shaped stones and a possible pathway. Possibly related to C3, C7, C8, C20.
C6	N/A	N/A	N/A	N/A	Non-archaeological.	N/A
C7	N/A	6	3.75	0.12	Stony path possibly related to C5.	Irregular spread of stony material. Aligned north-east to south-west.
C8	N/A	3	3	0.2	Metalled surface.	Sub-oval, irregular deposit of regular shaped stones. Possibly related to C3, C5, C7, and C20.
C9	N/A	N/A	2	0.7	Cut of ditch. Possibly backfilled. Possible field boundary.	Cut of linear ditch with sloping sides and a gradual break down to an irregular base. To the south of the feature the sides broadened and became shallower, giving a Y-shaped appearance. Length not known as it extended beyond the limit of excavation.
C10	C9	*c.* 33	1.23	0.31	Fill of part of ditch C9. Possible backfill.	Loose to moderately firm, dark brown to greyish sandy silt. Inclusions of small to moderate stones (0.01–0.1m diameter).
C11	C9	*c.* 33	2.4	0.6	In parts, upper fill, in parts basal fill of ditch C9. Possible field boundary.	Moderately firm fill consisting of silty clay. Light brown to yellowish in colour. Inclusions of small stones (0.01–0.05m diameter).
C12	N/A	0.4	5	1.7	Cut of linear ditch under stone path C7.	Cut of linear ditch with a gradual break of slope at top, sloping sides and uneven base.
C13	C12	0.3	N/A	1.7	Primary fill of ditch C12. Visible stone packing at the base.	Loose fill consisting of silty sand. Brown in colour. Frequent inclusions of charcoal and rare inclusions of small to moderate stones (0.01–0.1m).
C14	N/A	5	1.08	0.56	Cut of modern field drain.	Cut of a modern field drain that cut through the south-east corner of the cutting. The cut had concave sides and a U-shaped base.
C15	C14	5	1.08	0.56	Fill of field drain.	Basal fill of field drain that consisted of firmly compacted medium to light brown sandy silt that contained frequent stones.
C16	N/A	3.6	0.49	0.1	Agricultural furrow.	Shallow linear feature that contained rounded corners, sharp sides and a flat irregular base.
C17	C16	3.6	0.49	0.1	Fill of agricultural furrow.	Fill of agricultural furrow that consisted of mid-brown/yellow sandy silt.
C18	C19	2.2	1	0.18	Upper fill of kiln.	Primary fill of oval cut. The fill consisted of a moderately firm, mid-brown/grey silty clay that contained 25% charcoal inclusions and moderate small stone inclusions.
C19	N/A	2.2	1	0.32	Cut of kiln that showed evidence of *in situ* burning.	Sub-oval/ figure of eight-shaped cut that consisted of a sharp break of slope, straight sides and an almost flat base. The base (C33) was bright orange/red indicating *in situ* burning.

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description
C20	C9	1.39	0.9	0.05	Metalled surface.	Almost circular deposit of cobbles that underlay C10 in the south of the large ditch. This deposit overlaid C11.
C21	C12	0.15	1.25	1	The loose basal fill of the south-west corner of C12.	A loose, light brown sandy fill that contained occasional charcoal inclusions and small stones, that overlaid the cut C12 and underlay C13 at the south-west part of the ditch feature.
C22	N/A	N/A	N/A	N/A	Non-archaeological.	N/A
C23	C14	N/A	1.2	0.27	Upper fill of field drain.	Upper fill of field drain that consisted of a densely compacted brown/ grey silty fill that had occasional inclusions of charcoal, small stones and decayed stone.
C24	C9	2.25	2	0.25	In part, upper fill of part of the ditch.	Upper fill of part of the southern part of the ditch that consisted of a loose grey coloured sand with no inclusions.
C25	N/A	2	2	0.02	Spread of charcoal flecks.	Roughly circular spread of charcoal flecks, no evidence of *in situ* burning.
C26	C9	N/A	0.53	0.7	Modern test trench.	Fill of a trench dug across the large ditch possibly during test trenching that appeared to be a mix of C10 and C11. This trench was also cut through the subsoil and was backfilled by C29 and C27.
C27	N/A	N/A	0.53	0.7	Cut of part of modern test trench.	Extension of test trench cut through C9 that cut into the subsoil.
C28	N/A	N/A	N/A	N/A	Non-archaeological.	N/A
C29	C27	0.5	0.63	0.76	Fill of extended test trench.	Fill of extended test trench that consisted of redeposited subsoil.
C30	N/A	0.38	0.34	0.1	Cut of pit.	Circular shallow cut that contained gradual sides and a flat base that contained charcoal-enriched soil and burnt bone.
C31	C30	0.38	0.34	0.1	Fill of pit.	Fill of shallow pit that consisted of a loose, charcoal-enriched soil that contained 50% charcoal and 25% burnt bone.
C32	C19	0.8	0.85	0.1	Layer of charcoal-enriched soil within kiln.	Lens within C18 that consisted of a loose very dark brown/ black charcoal-enriched soil.
C33	C19	0.89	0.87	0.04	Base of kiln indicating *in situ* burning.	Base of oval-shaped pit that was very red/orange and contained heat-shattered stones indicating *in situ* burning.

Appendix 1.2 Catalogue of Artefacts

Registration Number	Context	Item No.	Simple Name	Full Name	Material	No. of Parts	Description
E3125:1:1	1	1	Pottery	Pottery. Painted pearlware. Teacup.	Pottery	1	18–19th Century. Body fragment.
E3125:1:2	1	2	Pottery	Pottery. Creamware. Plate/ dish.	Pottery	1	Rim fragment.
E3125:1:3	1	3	Stone	Hone/polishing stone.	Greywacke	1	Polishing stone, sub-rectangular in section.
E3125:1:4	1	4	Pottery	Pottery. Meath-type ware.	Pottery	1	13–14th Century. Body fragment.
E3125:1:5	1	5	Pottery	Pottery. Meath-type fine ware.	Pottery	1	13–14th Century. Body fragment.
E3125:1:6	1	6	Pottery	Pottery. Painted pearlware. Teacup.	Pottery	1	18–19th Century. Handle fragment.
E3125:1:8	1	8	Nail	Iron nail.	Iron	1	Badly corroded and encrusted.
E3125:1:9	1	9	Pottery	Pottery. Stoneware. Jar.	Pottery	1	Base fragment.
E3125:1:10	1	10	Stone	Unworked stone.	Sedimentary stone	1	Unworked stone piece.
E3125:1:11	1	11	Chert	Shatter.	Angular chert shatter	1	Unworked chert angular shatter.
E3125:1:12	1	12	Stone	Polishing stone.	Greywacke	1	Possible polishing stone.
E3125:1:13	1	13	Bead	Ammonite fossil.	Stone	1	May have been used as bead.
E3125:1:14	1	14	Pottery	Pottery. Red earthenware heavily abraded.	Pottery	1	18th–19th Century. Un–diagnostic.
E3125:1:15	1	15	Pottery	Pottery. Meath-type fine ware.	Pottery	1	13–14th Century. Body fragment.
E3125:1:17	1	17	Clay pipe	Tobacco pipe bowl.	Clay	1	Late 19thc with partial stamp, possibly Navan.
E3125:1:18	1	18	Flake	Flint flake.	Flint	1	Un-diagnostic.
E3125:1:19	1	19	Knife	Whittle tanged knife blade.	Iron	1	Parallel cutting edge, broken before tip.
E3125:13:1	13	1	Flint	Flint tool.	Flint	1	Retouched flint tool.

Appendix 1.3 Catalogue of Ecofacts

A total of 20 bulk soil samples were taken during the course of excavation at this site. 14 of these were processed by means of flotation and sieving through a 250/300µm mesh and the results of this are outlined below.

1.3.1 Animal Bone

Context number	Sample number	Feature	Sample weight (g)
C23	12	Ditch C9	0.4

1.3.2 Burnt Bone

Context number	Sample number	Feature	Sample weight (g)
C18	21	Kiln C19	0.1
C31	17	Pit C30	66.2
C31	18	Pit C30	60.8

1.3.3 Charcoal

Context number	Sample number	Feature	Sample weight (g)
C18	3	Kiln C19	0.5
C18	9	Kiln C19	1.3
C18	11	Kiln C19	9.3
C18	21	Kiln C19	5.5
C31	17	Pit C30	6.6
C31	19	Pit C30	11.7
C32	16	Kiln C19	2.5

1.3.4 Plant Remains

Context number	Sample number	Feature	Sample weight (g)
18	9	Kiln C19	7.3
18	11	Upper fill of kiln C19	0.1
32	16	Layer of charcoal rich soil in kiln C19	27.8
18	21	Upper fill of kiln C19	11

Appendix 1.4 Archive Checklist

Project: M3 – Navan to Kells, Contract 4	**Irish Archaeological Consultancy Ltd**	
Site Name: Grange 1		
Excavation Registration No.: E3125		
Ministerial Direction: A029/007		
Site director: Patricia Lynch		
Date: July 2010		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	7 plans	
Site sections, profiles, elevations	3 sections sheets	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1 levels notebook	
Site registers (folders)	1 lever arch folder	
Survey/levels data (origin information)	As above	
Context sheets	47 sheets	33 contexts altogether C9 has 5 sheets C10 has 3 sheets C11 has 4 sheets
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	118	
Photographs (print)	0	
Photographs (slide)	0	
Finds and Environ. Archive		
Flint/chert	3	
Stone artefacts	3	
Pottery (specify periods/typology)	8 medieval/post-medieval	
Ceramic Building Material (specify types eg daub, tile)	0	
Metal artefacts (specify types - bronze, iron)	2 – nail and knife blade: modern	
Glass	0	
Other find types or special finds (specify)	Possible bead, clay pipe fragment	
Human bone (specify type eg cremated, skeleton, disarticulated)	0	
Animal bone	4 samples	
Metallurgical waste	0	
Enviro bulk soil (specify no. of samples)	20	
Enviro monolith (specify number of samples and number of tins per sample)	0	
Security copy of archive	Yes	

APPENDIX 2 SPECIALIST REPORTS

THE MEDIEVAL AND POST MEDIEVAL POTTERY GRANGE 1

NIAMH DOYLE MA MIAI

NOVEMBER 2007

1 Introduction

The pottery assemblage from Grange 1 contains three sherds of 13th–14th century locally produced medieval pottery. The assemblage contains five fragments of post medieval pottery ranging in date from the 18th–19th century. The pottery represented within the assemblage consists of post medieval types associated with food consumption and household activities.

2 Methodology

These fragments were identified visually in accordance with existing typologies. A brief description of fabric and decoration is given. The different types of pottery are presented in tabular form. Medieval vessel types and styles of manufacture were identified in accordance with the Medieval Pottery Research Group's classification of ceramic forms (1998). Both medieval and post medieval types were identified based on information from published excavations in Ireland and existing typologies.

3 Dating

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.

4 Discussion

4.1 Local medieval pottery: Meath-type wares

The medieval pottery from Grange 1 consists of two locally produced medieval pottery types that have been named Meath-type ware and Meath-type fine ware. These local medieval wares are similar in form to much medieval pottery found in Ireland from the 13th–14th century, with a strong influence on form and decoration from Ham Green and Bristol Redcliffe wares. It is a convention on medieval pottery studies to name a pottery type after its production site, in the absence of a known production site the pottery is named as a type after the area in which it has been found to be most prolific (Blake and Davey, 1983, 39–40).

The medieval pottery type found at Grange 1, situated between Navan and Kells has also been found on multiple sites along the route between the towns of Navan and Kells in County Meath (Doyle 2007 a,c,d,f–m). Due to the fact that this local medieval pottery has been found in multiple sites in central Meath and the production site is as yet unknown the pottery has been named simply Meath-type and Meath-type fine ware.

This pottery is distinctly different to that already identified at Trim (Sweetman 1987), and Drogheda ware (Campbell 1996). Locally produced wheel thrown medieval pottery from county Meath sites Castlefarm 1 (Doyle 2007a) and Dunboyne 4 (Doyle 2007b) is similar to the sandy wheel thrown pottery from Killeen Castle (Doyle 2006) and Tullykane (Sandes 2006). This pottery type is different to the Meath-type ware described here. Meath-type fine ware, however is similar to the local fine wares from Castlefarm 1 (Doyle 2007a) and Garrettstown 2 (Doyle 2007c).

4.2 Meath-type pottery

The assemblage contains one fragment of Meath-type medieval pottery representing a MNR of one vessel of this type. The fabric of these vessels is soft powdery clay with frequent inclusions of haematite and mica as well as small stones that stand proud on the surface where the soft fabric has been weathered. The fine powdery clay of this type is the same as that used for the local fine wares described below with the addition of small stone inclusions. The assemblage also contains two fragments of Meath-type fine ware representing a MNR of one for this 13th–14th century local medieval ware. The soft nature of this pottery is such that it is often

heavily abraded meaning it is sometimes difficult to discern the throwing lines of this pottery.

Figure 1 - Catalogue of medieval pottery from Grange 1

Licence Number	Context	Find number	Links	Category	Type	Part
E3125	1	4		Ceramic	Pottery. Meath-type ware	Body fragment
E3125	1	5		Ceramic	Pottery. Meath-type fine ware	Body fragment
E3125	1	15		Ceramic	Pottery. Meath-type fine ware	Body fragment
Total no. of sherds						**3**

At least one hand-painted pearlware teacup is represented with painted orange and green decoration. Painted pearlware was a popular form of tableware in the 18th–19th century. A rim fragment represents a creamware plate/dish and a base fragment from a white glazed stoneware jar of a type used to contain ointments or preserves such as Dundee marmalade.

The assemblage contains a single fragment of red earthenware ceramic, with heavily abraded surfaces that hinder identification of type or form, although it is likely to have formed part of a glazed red earthenware vessel. Lead glazed red earthenware vessels were used widely in the home and industry in the 18th and 19th century and were manufactured in Ireland as well as imported from the UK (Meenan and McCutcheon 1997, 352).

Figure 2 - Catalogue of post medieval pottery from Grange 1

Licence Number	Context	Find number	links	Category	Type	Part
E3125	1	1		Ceramic	Pottery. Painted pearlware. Teacup	Body fragment
E3125	1	2		Ceramic	Pottery. Creamware. Plate/ dish	Rim fragment
E3125	1	6		Ceramic	Pottery. Painted pearlware. Teacup	Handle fragment
E3125	1	9		Ceramic	Pottery. Stoneware. Jar	Base fragment
E3125	1	14		Ceramic	Pottery. Red earthenware heavily abraded	Un-diagnostic
Total no. of sherds						**5**

Bibliography

Blake, H. and Davey, P. (eds) 1983 *Guidelines for the processing and publication of pottery from excavations.* London, Department of the Environment.

Campbell, Kieran. 1996 Ceramic report. In E. Halpin. Excavations at St. Mary D'Urso, Drogheda, County Louth*. County Louth Archaeological and Historical Journal* XXIII, 4, 452–510.

Doyle, N. 2007a The pottery from Castlefarm I- Contract 1 A017/001. Unpublished specialist report.

Doyle, N. 2007b The pottery from Dunboyne 4-Contract 1. A017/002. Unpublished specialist report.

Doyle, N. 2007c The pottery from Garretstown II- Contract 2 A008/008. Unpublished specialist report.

Doyle, N. 2007d The pottery from Grange 3 (E3123) A029-05. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007e The pottery from Grange 2 (E3124) A029-06. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007f The pottery from Grange 1 (E3125) A029/007. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007g The pottery from Phoenixtown 1 (E3128) A029-010. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007h The pottery from Kilmainham 1A (E3141) A029-053. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007i The pottery from Kilmainham 1 C (E3140) A029-022. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007j The pottery from Cookstown Great 3 (E3139) A029-021. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007k The pottery from Phoenixtown 2 (E3129) A029-011. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007l The pottery from Phoenixtown 3 (E3130) A029-012. Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Doyle, N. 2007m The pottery from Trevet 1 Contract 2 (E3067) A008-014. Unpublished specialist report.

Doyle, N. 2006 The pottery from Castle Ditch and Site G, Killeen Castle In C. Baker *Excavations at Killeen Castle, County Meath.*

McCutcheon, C. and Gahan, A. 1998 Medieval Pottery. In *Late Viking Age and Medieval Waterford. Excavations 1986–1992.* Waterford Corporation.

Meenan, R. and McCutcheon, C. 1997 Post Medieval Pottery. In *Late Viking Age and Medieval Waterford. Excavations 1986–1992.* Waterford Corporation.

MPRG. 1998 *A Guide to the Classification of Medieval Ceramic Forms.* Great Britain.

Sweetman, David. 2000 Medieval pottery. In T. Barry, Excavations in Piperstown Deserted Medieval Village, County Louth 1987. *Proceedings of the Royal Irish Academy,* **100**C, 124–125.

THE LITHICS
GRANGE 1 (E3125)

EIMEAR NELIS

Introduction

During archaeological mitigation at the M3 Navan to Kells road scheme, excavations uncovered a number of archaeological sites. The project yielded a large assemblage of chipped, ground and unworked stone artefacts from numerous sites. This report documents the analysis of the chipped stone assemblage from Grange 1 (A029/007, E3125).

Methodology

All recovered artefacts were presented for analysis, and were studied visually and catalogued using SPSS (V13) for Windows. For each artefact, the following details were recorded: contextual information (including context/feature/sample number, northings and eastings where available), basic condition, extent of abrasion, material, colour, cortex, basic character and detailed classification, platform and termination type (where relevant for chipped stone), detail of working (where relevant), length (L), breadth (B), thickness (T), fragment size (mm) and mass (g). The criteria upon which these attributes have been selected, and the analytical methodology deployed, are presented in some detail elsewhere (Nelis 2003).

Flint and chert assemblage: Summary

Excavations at Grange 1 uncovered the remains of a prehistoric pit and an undated hearth, as well as undated linear ditch features and cobbled areas (Lynch 2008). The excavations produced a small chipped stone assemblage, including two flint and one chert artefacts (Table 1), as well as a small assemblage of ground stone artefacts; with the exception of one retouched flint flake (found in C13) all ground and chipped stone artefacts were found in topsoil.

Unique No	Context	Basic Character	Classification	Condition	Cortex	Fragment size (mm)	Length (mm)	Breadth (mm)	Thickness (mm)	Mass (g)
E3125:1:11	*1*	*Angular shatter*	*Angular shatter*	*Abraded*	*Tertiary*	*0*	*15*	*15*	*5*	*1.45*
E3125:1:18	1	Flake	Pressure	Fresh	Secondary	0	8	8	1	0.11
E3125:13:1	1	Modified tool	Edge retouched	Patinated	Tertiary	0	24	22	9	2.94

Table 1: M3 Clonee–North of Kells: Contract 4: Grange 1 (E3125): showing basic composition of the flint and chert assemblage (NB: italics denotes chert).

The assemblage includes a piece of unworked chert angular shatter (E3125:1:11) and a flint flake (E3125:1:18), both of which were recovered from topsoil. The unworked chert piece requires no further comment, and the flint artefact is a small flake produced using pressure rather than percussion. Such small flakes produced using this technique tend to be debitage associated with the secondary production of tools or, in some cases, specific core preparation before the removal of a larger flake. It is not possible to determine with certainty which scenario saw the production of this piece, but it does point to a significant level of control and skill in knapping, in that it indicates that knapping was well planned and finely executed. It also indicates that tool production, or at least the latter stages of core reduction, were undertaken in the area. Such types are not good chronological indicators, and it was not found in an archaeological context, having been recovered from topsoil (C1; *ibid*., 13).

In addition to these pieces, a retouched flint tool was found in C13 (the fill of undated linear ditch C12) (Plate 1). This is a small triangular-shaped flake fragment, minimally retouched along all three edges. Such expediently produced tools are common and

seem to opportunistically utilise flake fragments; consequently, their morphology can be quite variable and they tend to chronologically un-diagnostic, but their function can sometimes be inferred and this piece may have served as a piercer.

Ground stone: Summary

A small number of honestones/polishing stones were identified within the assemblage (E3125:1:3 & 12; Plates 2–4), as well as a fragment of an apparently unworked stone (E3125:1:10). The worked examples include a fragment of a small block-shaped honestone, and a fragment of a sub-circular polishing tone, both of which were found in topsoil. Such artefacts are a common feature of tool assemblages, particularly during the early medieval/medieval periods (eg Hurley *et al* 1997, 410), but all ground stone artefacts were found in topsoil, and therefore their period of use is unknown. Both carried evidence for some use, and the smaller piece (E3125:1:3) bears some linear striations and gouges, and may have been used for sharpening.

E3125:1:3

Hone/polishing stone: fragment

Sedimentary greywacke: 55mm (L) x 40mm (B) x 24mm (T); 71.4g.

Grey with a fine matrix and visible grains of quartz. This piece survives as a medial fragment of a hone/polishing stone, sub-rectangular in section (Plate 2). One lateral face has been very rounded by polishing/rubbing, with linear striations. Two to three possible gouge-marks survive on the top surface.

E3125:1:10

Unworked stone: fragment

Sedimentary: possibly conglomerate: 110mm (L) x 40mm (B) x 38mm (T); 248.1g.

Fine grain grey matrix, throughout this matrix there are coarser inclusions of quartz, feldspar and possible iron minerals. This is an angular fragment of a weathered, rounded boulder. It appears to be unworked.

E3125:1:12

Possible polishing stone: fragment.

Sedimentary greywacke: 194mm (L) x 146mm (B) x 50mm (T); 3.1kg.

Inferior and superior surfaces are dark in colour, quartz and feldspar present in the lighter grey matrix. Fragment survives as slice of larger stone, sub-circular in shape, rounded/polished lateral edges with tangential linear break (Plates 3–4); break surfaces extremely uniform and almost parallel, with thickness ranging from just 47–50mm. One face polished/worn smooth, but has been uniformly worn across entire surface with no concave dishing apparent; other face also possibly worn, but to a lesser extent and with some irregularities in fracture-line still visible.

References

Lynch, P. 2008 *M3 Clonee–North of Kells: Contract 4: Navan–Kells and Kells Bypass: Interim report of archaeological excavation at Grange 1, E3125.* Unpublished report prepared by IAC Ltd for Meath County Council.

Nelis, E. 2003 *Lithics of the Northern Irish Neolithic*. Unpublished PhD thesis. Belfast: Queen's University, Belfast.

PLATES

Plate 1: Grange 1 E3125:13:1: Edge retouched tool: possible piercer.

Plate 2: Grange 1 E3125:1:3: Medial fragment of hone/polishing stone.

Plate 3: Grange 1 E3125:1:12: Sliced sub-circular stone, showing face worn by polishing.

Plate 4: Grange 1 E3125:1:12: Sliced sub-circular stone, showing face worn by polishing and fractured edge.

THE METAL FINDS
GRANGE 1

JACQUELINE MAC DERMOTT

MAY 2009

The badly corroded nail 1:8 from topsoil was probably modern. A whittle tanged knife 1:19 was found in the topsoil layer. The shape of the tang in relation to the blade would suggest it is late post-medieval or relatively modern.

Catalogue.

E3125:1:8
Nail. Iron. Badly corroded and encrusted. No details visible. Length (mm): 52. Context C1. Topsoil. Modern

E3125:1:19
Knife. Iron. Whittle tanged, running flush with straight back of blade. Parallel cutting edge, broken before tip. Length (mm): 120. Width (mm): 16. Thick (mm): 6.3. Context C1. Topsoil. Modern.

Recommendations:
None.

Objects for illustration/photography:
None.

THE WORKED STONE
GRANGE 1

RICHARD O'BRIEN

MAY 2009

Grange 1, E3125:1:13
This object was examined by the author. It measured 9mm in diameter, 2mm in thickness and the perforation was 3mm wide. It had two thin striations around the edge which was generally rough in texture. One face was damaged in antiquity. The stone probably represented an ammonite and could have been utilised as a bead. It resembled a bead from the Neolithic site of Thornhill, Co. Derry (Logue 2003, 154 Figure 17.6).

Reference
Logue, P. 2003 Excavations at Thornhill, Co. Londonderry. In I. Armit, E. Murphy, E. Nelis and D. Simpson (eds), *Neolithic Settlement in Ireland and Western Britain*, 149–155. Oxbow Books, Oxford.

THE CLAY TOBACCO PIPES
GRANGE 1

JOE NORTON

MAY 2009

It was only possible to be very general in attributing a date as the item was too small for positive dating.

Find No.	Date	Description
E3125: 1:17	*c.* 1860–1900	Late 19thc. Bowl Fragment with partial stamp, possibly Navan, probably a local Merchant's stamp

Table 1 – Catalogue of clay pipe pieces from Grange 1

THE CHARCOAL REMAINS
GRANGE 1 E3125
LORNA O'DONNELL

JUNE 2010

1 Introduction

A linear ditch was excavated at Grange 1. To the east of the ditch lay areas of cobbling, while to the west a hearth and possible cremation pit were excavated (Lynch 2009). The site was excavated as part of the M3 Navan–Kells bypass (Contract 4). The aim of the charcoal analysis is to provide a floristic background to the area. The analysis can also identify any wood selection patterns at Grange 1, either for fuel or for construction.

2 Methodology (After IAC Ltd)

2.1 Processing

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

2.2 Charcoal identification

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

2.3 Details of charcoal recording

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

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

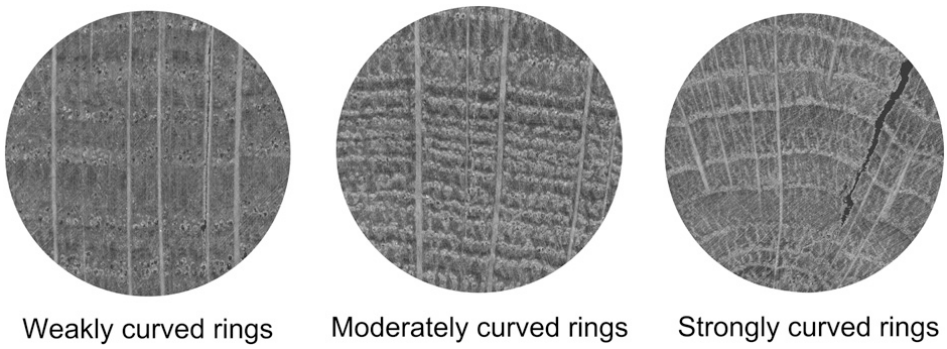

Figure 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches (After Marguerie and Hunot 2007 1421, Fig. 3).

3 Results

Charcoal was examined from two contexts from Grange 1. Eight wood taxa were identified from the site, including hazel (*Corylus avellana*), oak (*Quercus* sp.), ash (*Fraxinus* sp.), elm (*Ulmus* sp.), willow (*Salix* sp.), pomaceous fruitwood (Maloideae spp.), alder (*Alnus* sp.) and birch (*Betula* sp.). The results are dominated by alder, followed by hazel (Fig. 2).

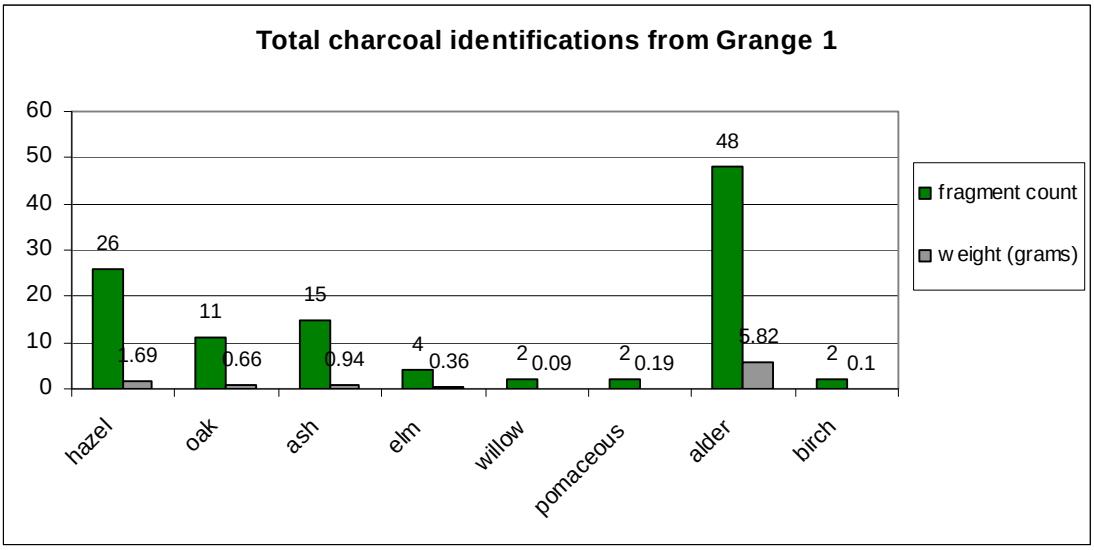

Figure 2 Charcoal identifications from Grange 1

Only two trees were identified from the possible cremation pit C31 (fill C30), the main one is alder, while five fragments of hazel also noted. This context dates to the middle Bronze Age (1613–1459 cal BC, 2 sigma calibration). The presence of alder and hazel only in a cremation pit is unusual, recent excavations have demonstrated the frequent selection of oak and pomaceous fruitwood for funeral pyres (O'Donnell

2007, O'Donnell *et al* 2009). There are exceptions to this of course, for example a middle Bronze Age cremation pit excavated at Armalughey, Co. Tyrone, where alder and ash only were identified (O'Donnell 2010a).

In contrast to C30, a variety of trees were identified from the fill (C18) of C19, including hazel, oak, ash, elm, willow, pomaceous fruitwood, alder and birch. A large cache of cereal grain was identified from this hearth (Lyons 2009) which has been radiocarbon dated to cal AD 428–549 (2 sigma calibration). This feature may have been used to facilitate crop drying (Lyons 2009). The wood present provides a picture of nearby fuel resources to the site. Clearly a particular temperature was not required using high a high calorie fuel (for example oak), rather a more random mix of firewood was used.

The site is located close to Grange 2, where evidence for metal working and a small cemetery were excavated, dating from the Iron Age to the early medieval period. The charcoal from this site is dominated by hazel and oak. With the exception of birch, all of the wood taxa identified from Grange 1 were also found in Grange 2 (O'Donnell 2010b).

4 The Grange environment

The charcoal results indicate that Grange was located close to a mosaic of different woodland types when the site was in use, including canopy, shrub/scrub and wet woodlands.

The main wood identified from the site is alder. This indicates nearby wet areas. Ireland's native tree is the black or grey alder (*Alnus glutinosa*). It is a wetland tree, and can often be seen growing alongside rivers, lakes, in marshes or in fens. A consistent and abundant supply of moisture is essential for its germination and early growth. The tree can grow up to 25m, and can attain a maximum girth of up to 1m. The tree can reach ages of between eighty and one hundred years (Stuijts 2005, 139). In comparison, all willows favour wet conditions, and it may be a pioneer species on wet soils (Orme and Coles 1985, 10). Willows are not naturally a woodland species, although shrubby growth may occur under light woodland cover. In comparison to alder, willows favour wet conditions, and it may be a pioneer species on wet soils (Orme and Coles 1985, 10).

There are two native Irish oaks, and they cannot be separated by wood anatomy. The two species will grow in quite different habitats. The pedunculate oak (*Quercus robur*) will usually grow on heavy, lowland soils, where it will also tolerate flooding. In contrast, the sessile oak (*Quercus petraea*) will grow on less fertile, acidic soils. Oaks can reach a height of 40 metres and live for 1,000 years or more (Hickie 2002, 60). It makes excellent firewood. It splits and is easy to work with, which combined with durable heartwood makes it a preferred choice for all larger structural timbers.Hazel will often grow in association with oak. It is a medium sized, deciduous tree, and can reach a height of 15m. It will grow on a wide range of soils, including limestone, mildly acid soils and clays (Lipscombe and Stokes 2008, 102).

Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188). Elm trees will grow well on rich, alluvial soils and do prefer riverine habitats (Gale and Cutler 2000, 264).

Some scrub or shrub trees were also identified from Grange 1 in the presence of pomaceous fruitwood. The Maloideae group, a sub family of the Rosaceae includes crab apple, wild pear, rowan/whitebeam and hawthorn. It is extremely difficult to separate these through wood anatomy. Crab apple (*Malus sylvestris*) tends to be

found on woodland edges (Hickie 2002, 55). Wild pear (*Pyrus pyraster*) is mostly found as an isolated tree (Stuijts 2005). Rowan (*Sorbus aucuparia*) is a tough colonizer which can tolerate peaty soils and exposed conditions. It needs plenty of light to thrive (Hickie 2002, 65). Whitebeam (*Sorbus aria*) grows up to 20m high and has a preference for limestone soils (Orme and Coles 1985, 11). Hawthorn (*Crataegus monogyna)* can thrive in all but the most acid of soils (Gale and Cutler 2000). As wild pear is not a native Irish species, it is likely that the charcoal represents other types encompassed in the Maloideae group.

It is not possible to separate silver birch (*Betula pendula*) and downy birch (*Betula pubescens*) through wood anatomy. Silver birch prefers dry conditions and will grow well on light, dry soils (Lipscombe and Stokes 2008, 140), in contrast, however, the downy birch prefers wetter conditions and will grow on poorly drained soils (*ibid*., 178).

5 Summary

Charcoal was identified from two contexts at Grange 1, a middle Bronze Age cremation pit and an Iron Age/early medieval hearth. Alder and hazel only was identified from the cremation pit. In contrast, eight trees were identified from the hearth which may have been associated with crop processing.

References

Gale, R. 2003 Wood based industrial fuels and their environmental impact in lowland Britain. In P. Murphy and P.E.J. Wiltshire (eds), *The Environmental Archaeology of Industry,* 30–47. Oxford.

Gale, R. and Cutler, D., 2000 *Plants in Archaeology. Identification of vegetative plant materials used in Europe and the southern Mediterranean to c. 1500*. West Yorkshire.

Hather, J.G. 2000 *The Identification of the Northern European Woods. A guide for archaeologists and conservators*.Archetype. London.

Hickie, D. 2002 *Native trees and forests of Ireland*. Dublin.

Lipscombe, M. and Stokes, J. 2008 *Trees and how to grow them. London.*

Lynch, P. 2009 Interim report on archaeological excavation of Grange 1, E3125. Unpublished report prepared by Irish Archaeological Consultancy Ltd for Meath County Council.

Lyons, S. 2009 Plant remains report, Grange 1, Co. Meath E3125. Unpublished specialist report prepared for Irish Archaeological Consultancy Ltd on behalf of Meath County Council.

Marguerie, D. and Hunot, J.Y. 2007 Charcoal analysis and dendrology: data from archaeological sites in north-western France. *Journal of Archaeological Science* **34** 1417–1433.

O'Donnell, L. 2007 The wood and charcoal. In E. Grogan, L. O'Donnell and P. Johnston (eds) *The Bronze Age Landscapes of the Pipeline to the West: An integrated archaeological and environmental assessment,* 27–69. Bray.

O'Donnell, L., Halwas, S. and Geber, J. 2009 Chapter 8 The environmental and faunal evidence. In Mc Quade, M., Moriarty, C. and Molloy, B. *In the Shadow of the Galtee Mountains: Excavations along the N8 Cashel to Mitchelstown,* 241–286. Bray.

O'Donnell, L. 2010a Analysis of the charcoal from Armalughey, Co. Tyrone (AE/08/77). Unpublished specialist report prepared for Archaeological Development Services Ltd.

O'Donnell, L. 2010b Analysis of the charcoal from Grange 2, Co. Meath (E3122). Unpublished specialist report prepared for Irish Archaeological Consultancy Ltd on behalf of Meath County Council.

Orme, B.J. and Coles, J.M. 1985 Prehistoric woodworking from the Somerset levels: 2: Species selection and prehistoric woodlands. *Somerset Levels papers,* **11**, 7–24.

Schweingruber, F.H. 1978 *Microscopic wood anatomy*. Birmensdorf: Swiss Federal Institute for Forest, Snow and Landscape Research.

Stuijts, I. 2005 Wood and charcoal identification. In M. Gowen, J. Ó Neill and M. Philips (eds) *The Lisheen Mine Archaeological Project 1996–8*, 137–186. Dublin.

Wheeler, E.A, Bass, P. & Gasson, P.E. 1989 *IAWA list of microscopic features for hardwood identification*. IAWA Bulletin nos. **10** (3): 219–332.

Table 1 Charcoal identifications from Grange 1

Sample number	Context number	Feature type	Wood taxon	Flot weight	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Ring curvature	Insect holes	Tyloses	Comment
11	C18	fill of C19	*Corylus avellana* (hazel)	9.3	21	1.47	5–10	5–10	medium	strongly curved	present		
11	C18	fill of C19	*Quercus* sp. (oak)	9.3	11	0.66	1–6	3–4	medium	strongly curved			
11	C18	fill of C19	*Fraxinus* sp. (ash)	9.3	15	0.94	5–8	1–2	Fast	strongly curved			
11	C18	fill of C19	*Ulmus* sp.(elm)	9.3	4	0.36	5–8	1–3	Fast	strongly curved			
11	C18	fill of C19	*Salix* sp. (willow)	9.3	2	0.09	5	2–3	medium	strongly curved			
11	C18	fill of C19	Maloideae spp. (pomaceous fruitwood)	9.3	2	0.19	5	2–3	medium	strongly curved			
11	C18	fill of C19	*Alnus* sp. (alder)	9.3	3	0.26	5	2–5	medium	strongly curved			
11	C18	fill of C19	*Betula* sp. (birch)	9.3	2	0.1	5	2–3	medium	strongly curved			
19	C31	pit C30	*Alnus* sp. (alder)	11.7	45	5.56	5–10	4–6	medium	weakly curved			
19	C31	pit C30	*Corylus avellana* (hazel)	11.7	5	0.22	5–8	4–6	medium	strongly curved			

THE PLANT REMAINS
GRANGE 1 (E3125)

SUSAN LYONS MSC MIAI

JANUARY 2010

1 Introduction

Four flot samples were analysed from excavations associated with archaeological activity recorded at Grange 1, Co. Meath. Grange 1 was excavated as part of the archaeological mitigation programme associated with Contract 4 of the M3 Navan–Kells and Kells Bypass, which formed part of the proposed M3 Clonee to North Kells Motorway Scheme. The site consisted of a linear ditch which ran north–south through the centre of the site. To the east of the ditch was an area of cobbling, while a possible hearth and a small cremation pit were located to the west of the ditch (Lynch 2009). A barley grain from **C32** (fill of **C19)** was sent for radiocarbon dating and returned a date of Cal AD 428–549 (2 sigma).

The primary objective of the plant remains project is to identify, analyse and interpret the charred and any waterlogged botanical remains present in order to help with understanding the change in the floral environment and activities at the site over time and to help with highlighting the function of certain areas of the site or indeed the features recorded within. This report will later form part of an overall scheme-wide report encompassing all sites along the M3 Clonee to North Kells Motorway Scheme (Lyons *forthcoming)*.

2 Methodology

2.1 Sample processing (after IAC Ltd)

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

2.2 Quantification and identification of plant remains

The flot samples are viewed under a low powered binocular microscope (Nikon SMZ645) at magnification x0.8 to x5 and any carbonised or potentially waterlogged botanical materials were identified to genus/species level where applicable. Where preservation allowed, all charred and waterlogged plant remains recovered were identified to species level where applicable and the constituents quantified numerically. Those plant remains which were abraded or fragmented were recorded

using an abundance key to highlight the concentrations of material identified from each sample;

+ = rare (1–10) ++ = occasional (11–50)
+++ = common (51–100) ++++ = abundant (>100)

To fully identify charred remains, a series of morphological characteristics are recorded, which includes length, breadth, shape on the longitudinal and transerve planes, texture of the seed coat (smooth or reticulate), attachments (pappus), scars (hilum) and the presence of the embryo and endosperm components in cereal grains (Pearsall 2000, 135–6). Cereal chaff fragments were noted for glume base angle, ventral/dorsal keels, nerves, size of lemma scars etc (Hillman 1981).

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

3 Results

Four samples from **C19** were submitted for archaeobotanical analysis; **C18** (Samples 6, 9 and 11) and **C32** (lens within **C19**).

The results are summarised in **Table 1.**

***Wood charcoal* –** Charcoal was recorded from **C18**. The material was very fragmented and in minute fibres in many cases with average fragment size of <5mm diameter.

***Carbonised cereal grain* -** Carbonised cereal grains were recorded in relatively high concentrations, especially from the samples associated with **C18**. Barley (*Hordeum* sp.) dominated the assemblage, with much lower incidences of oat (*Avena* sp.) also identified. The oat grain was in a poor state of preservation for the most part but based on grain size and the absence of a distinct basal scar (suckermouth) (Stanton 1955, 103), the cultivated/common oat type (*Avena sativa)* is likely to be the most common oat species recorded from the assemblage. The majority of the grains were free of the chaff components [spikelets, glume bases and palea/lemma (hulls)], which are required in identifying between species and therefore definitive identifications were difficult to undertake.

A number of vesicular and eroded grains were also recorded from **C18** and **C32** and these vappear in the tables as indeterminate grain. Cereal grains can become eroded and abraded as a result of charring at high temperatures, that the grain was damp when burnt or that this material had degraded due to re-deposition and/or exposure.

***Carbonised wild taxa* –** Carbonised seeds (nutlets) of *Polygonum* sp. (knotgrass) were recorded from **C18**. These species are common weeds of disturbance and waste ground.

4 Discussion

4.1 Carbonisation of plant remains

Charred plant remains are those which have been heated to more than about 200° C, but where there is not enough oxygen to complete the burning process. Instead, the organic components are converted to a more carbon-rich resilient material or to carbon itself rather than to ash (Broadman & Jones 1990). Despite being subjected to high temperatures, many charred remains retain a morphology or exterior detail which can aid plant identification to genus or even species level. Some remains are found in the same place that they were charred (hearths, fires, kilns, ovens, burnt stores). More are found thinly spread and scattered across a wider area entering deposits such as occupational layers, pits and potholes for example. Over time, this material can move and be re-distributed due to disturbances such as soil movement, extreme climatic conditions, root penetration or worm/animal action. The carbonisation process obviously affects different species and plant components in different ways, where finer, lighter material can be destroyed more easily than larger elements. It most therefore be noted that the charred plant remains recovered from archaeological features can as much reflect the results of the carbonisation process as how and what plant remains were used on a site.

4.2 Carbonised plant remains from Grange 1

The carbonised cereal and weed assemblage recorded from Grange 1 was confined to **C19** (**C18** and **C32**). The assemblage was made up of predominantly barley followed by oat and grains of indeterminate species, with a low occurrence of *Polygonum* sp. seeds also identified. While barley has been cultivated from the prehistoric period to the present day, the cultivation of oat is primarily dated from the early medieval period in Ireland (Monk 1986). These cereals would have been cultivated and consumed by all social classes during the medieval period, with oat also used for animal fodder.

The large cache of cereal grain recorded from **C19**, especially from fill **C18** coupled with the evidence for *in situ* burning (Lynch 2009, 8) suggests that this feature was in some way used to facilitate the drying of crops. The occurrence of barley and oat together indicates a medieval assemblage and this is supported by a radiocarbon date of AD 428 – 549 which was returned from a barley grain within **C32**. While **C32** contained small quantities of cereal grains, a high charcoal content was recorded (Lynch 2009, 8), which implies that this deposit was possible fire-spot residue or remains from the hearth that fuelled the kiln. The fact that the grain was left *in situ* suggests that **C19** was not cleaned out and possibly even abandoned after a fire or conflagration event within the feature. Since both cereal types were quite abraded, this may suggest that the grain had been lying exposed and re-worked before becoming sealed. Based on the high barley grain content, it is likely to have been the last crop kilned or stored within this feature. It is difficult to ascertain however whether the remains reflect one or more burning episodes. The presence of oat may represent residual material from a separate drying activity.

An interesting observation is the absence of chaff and low occurrence of weed seeds from the assemblage, which can indicate that cereals were either being prepared for long-term storage or for grinding and milling. Grains would require full processing (removal of chaff and weeds) prior to storage to prevent spoilage of the crop (van der Veen, 1989, 304). The weed seeds recovered from **C18** may also have been brought to the site with the gathered crop and charred inadvertently with the crops themselves.

5 Summary

Four samples associated with deposits from **C19** (**C18** and **C32**) were selected for archaeobotanical analysis. The carbonised plant remains assemblage contained predominantly barley with much lesser oat and wild taxa, in the form of *Polygonum* sp. (knotgrass) seeds. These crops are typical of a medieval cereal assemblage, which suggests that medieval crop drying activities were being undertaken at Grange 1.

6 Recommendations

1 There is no further identification work required on the sample submitted for Grange 1. Any additional processed samples associated with features excavated at the site should also be scanned to determine if there are any other plant remains present, which may help with the interpretations put forward.

2 A record of the methodology and results of this assessment should be included in any final report.

7 References

Beijerinck, W. 1976 *Zadenatlas der Nederlandsche Flora*. Amsterdam.

Boardman, S. and Jones G. 1990 Experiments of the effects of charring on cereal plant components. *Journal of Archaeological Science* **12**, 1–11.

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

Clapham, A. R., Tutin, T. G., Warburg, E. F. 1957 *Flora of the British Isles* Cambridge.

Hillman, G. 1981 Reconstructing crop husbandry practices from charred remains of crops. In R. Mercer (eds), *Farming practices in British prehistory – 2nd edition*, 123–16*2.* Edinburgh.

Lynch, P. 2009 *M3 Clonee – North of Kells Motorway Scheme, Contract 4: Grange 1 E3125.* Unpublished report prepared by IAC Ltd for Meath County Council.

Lyons, S. forthcoming *Plant Macrofossil Analysis from the M3 - overall integrated report.* Unpublished specialist report prepared for IAC Ltd on behalf of Meath County Council.

Monk, M. A. 1986 Evidence from macroscopic plant remains for crop husbandry in prehistoric and early historic Ireland: A review. *The Journal of Irish Archaeology* **III**, 31–36.

Pearsall, D. 2000 *Palaeoethnobotany: Handbook of Procedures* (2nd edition) San Diego.

Stace, C. 1997 *New Flora of the British Isles* (2nd edition). Cambridge.

Stanton, T. R. 1955 *Oat Identification and Classification.* US Dept. of Agriculture Technical Bulletin No. **1100**, Washington DC.

Van der Veen, M. 1989 Charred grain assemblages from Roman- period corn dryers in Britain. *Archaeological Journal* **146**, 302–319.

Table 1. Composition of plant remains from Grange 1 (E3125)

Feature	Context number	Sample Number	Flot volume (grams)	Context description	Wood charcoal	Carbonised cereal grains	Carbonised wild taxa	Comments
C19	18	9	7.3 grams	Upper fill of oval charcoal rich feature C19	++	++++	+	Barley (x202) Oat (x3) Cereal indet ++++ *Polgonum* sp. (x3)
	18	11	0.1 grams	Upper fill of oval charcoal rich feature C19		+		Barley (x1)
	32	16	27.8 grams	Layer of charcoal enriched soil within oval shaped pit C19		++		Barley (x11) Oat (x6) Cereal indet +
	18	21	11 grams	Upper fill of oval charcoal rich feature C19		++++	+	Barley (x247) Oat (x5) Cereal indet ++++ *Polygonum* sp. (x9)

Key: + = rare (1–10), ++ = occasional (11–50), +++ = common (51–100) and ++++ = abundant (>100)

THE FAUNAL REMAINS
GRANGE 1 (E3125)

MARGARET MCCARTHY

DECEMBER 2009

Excavations at Grange 1 yielded a total sample of 555 indeterminate fragments of bone. The preservation of the material is very poor and all fragments represent small fractured pieces of burnt bone.

Possible Cremation Pit
Over 97% of the bones from the site came from a single isolated cremation pit (C30) of presumed Bronze Age date. The sample consists of 542 extremely fragmented and calcined bone and none of these can be identified to species. Nine fragments are sufficiently large to indicate that they derive from a medium-sized mammal, perhaps sheep/goat or pig. The remainder of the sample is indeterminate.

Oval charcoal rich feature
The fill (C18) of a charcoal-rich feature (C19) interpreted as a hearth contained three indeterminate fragments of calcined bone all of which are calcined to a white chalky appearance.

Linear field boundary
The excavated area was bisected by a linear field boundary (C14) and the upper fill of this feature contained the very fragmented remains of a cow tooth.

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

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

The “Calibrated date range” is equivalent to the probable calendrical age of the sample material and is expressed at the one Sigma (68.3% probability) and two-Sigma (95.4% probability) level of confidence.

Calibration dataset:
Calibration programme: CALIB REV5.0.2 - used in conjunction with Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215–230.

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C32 Kiln fill	16	Cereal grain	Barley (*Hordeum* sp.) (<0.1g)	QUB	UB11129	AMS(Std)	AD 436–540 (1 sigma), AD 428–549 (2 sigma)	1562+/-22	-23.8
C31 pit fill	17	Burnt Bone	Burnt Bone (4.3g)	QUB	UB12939	AMS(Std)	1605–1498 BC (1sigma), 1613–1459 BC (2 sigma)	3262±25	-24.1

APPENDIX 3 LIST OF RMP SITES IN AREA

RMP No	Description
ME024:003	Enclosure Site
ME024:007	Church Site Possible
ME024:008	Rectilinear Enclosure

See Figure 2 for locations.

APPENDIX 4 LIST OF M3 CONTRACT 4 SITE NAMES

Site Name	Director	Contract site reference no.	Excavation Registration No.
Ardbraccan 5	Carmel Duffy	A029-001	E3119
Ardbraccan 6	Ciara MacManus	A029-002	E3120
Grange 5	Amanda Kelly	A029-003	E3121
Grange 4	Carmel Duffy	A029-004	E3122
Grange 3	Amanda Kelly	A029-005	E3123
Grange 2	Amanda Kelly	A029-006	E3124
Grange 1	Patricia Lynch	A029-007	E3125
Phoenixtown 5	Tim Coughlan	A029-008	E3126
Phoenixtown 6	Ed Lyne	A029-009	E3127
Phoenixtown 1	Ed Lyne	A029-010	E3128
Phoenixtown 2	Ed Lyne	A029-011	E3129
Phoenixtown 3	Ed Lyne	A029-012	E3130
Phoenixtown 4	Ed Lyne	A029-013	E3131
Ballybeg 1	Patricia Lynch	A029-014	E3132
Ballybeg 2	Patricia Lynch	A029-015	E3133
Nugentstown 3	Patricia Lynch	A029-016	E3134
Nugentstown 2	Patricia Lynch	A029-017	E3135
Nugentstown 1	Patricia Lynch	A029-018	E3136
Cookstown Great 1	Patricia Lynch	A029-019	E3137
Cookstown Great 2	Gill McLoughlin	A029-020	E3138
Cookstown Great 3	Gill McLoughlin	A029-021	E3139
Kilmainham 1A	Ed Lyne	A029-053	E3141
Kilmainham 1B	David Bayley	A029-054	E3142
Kilmainham 1C	Fintan Walsh	A029-022	E3140
Kilmainham 2	David Bayley	A029-023	E3143
Kilmainham 3	Yvonne Whitty	A029-024	E3144
Gardenrath 2	David Bayley	A029-025	E3145
Gardenrath 1	David Bayley	A029-026	E3146
Town Parks 1	Gill McLoughlin	A029-027	E3147
Town Parks 2	Catriona Gleeson	A029-028	E3148
Town Parks 3	Catriona Gleeson	A029-029	E3149
Town Parks 4	Yvonne Whitty	A029-030	E3150
Town Parks 5	Yvonne Whitty	A029-031	E3151
Town Parks 6	Yvonne Whitty	A029-032	E3152
Newrath Little 3	James Kyle	A029-033	E3153
Newrath Little 2	Yvonne Whitty	A029-034	E3154
Newrath Little 1	James Kyle	A029-035	E3155
Town Parks / Commons of Lloyd 1	David Bayley	A029-036	E3156
Commons of Lloyd 1	Yvonne Whitty	A029-037	E3157
Cakestown Glebe 2	Patricia Lynch	A029-038	E3158
Cakestown Glebe 1	Patricia Lynch	A029-039	E3159
Ballybeg 3	Tim Coughlan	A029-040	E3160
Ballybeg 4	Patricia Lynch	A029-041	E3162