



M1 DUNDALK WESTERN BYPASS

SITE 111A: NEWTOWNBALREGAN 1.1

CHAINAGE 20.405

NGR: 301949/308018

FINAL REPORT

ON BEHALF OF
LOUTH COUNTY COUNCIL and the
NATIONAL ROADS AUTHORITY

LICENSEE: DAVID BAYLEY
LICENCE NUMBER: 02E1835

JULY 2009

NON-TECHNICAL SUMMARY

Irish Archaeological Consultancy Ltd. (IAC Ltd.), funded by Louth County Council and the National Roads Authority, undertook an excavation in the townland of Newtownbalregan, c.2km to the northwest of Dundalk, in advance of the construction of the Dundalk Western Bypass (DWB). The excavation was undertaken to ensure all subsoil archaeological remains were preserved by record in advance of groundwork.

The previously unknown site was discovered at route chainage 20.405, during a test trenching programme undertaken by IAC in March 2002 (Licence Ref.: 02E0370). The site was located at the base of a slope c.800m south of the N53 Castleblaney Road.

Resolution excavation at Newtownbalregan 1.1 began on the 10th of November 2002 and was completed on the 10th of January 2003 using a team of five Field Archaeologists, directed by David Bayley.

At Site 111A, Newtownbalregan 1.1, the remains of a layer of small heat-affected stones, and a probable central hearth or kiln were recorded. There were a number of shallow pits around this surface, and one large pit to the west which contained evidence of *in situ* burning. The stone layer sealed a layer of grey silt/ash like clay, which in turn sealed a number of stakeholes, and another shallow pit. Charcoal samples were taken from the hearth or kiln and were identified as ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) (Appendix 2.1). The charcoal returned a date of 3320±41 BP (WK – 18557) (Appendix 2.2). The 2 Sigma calibrated results from this sample produced a date of Cal. 1700BC–1500BC dating the kiln to the Early/Middle Bronze Age.

ACKNOWLEDGEMENTS

The archaeological excavation at Site 111A, Newtownbalregan 1.1, County Louth was carried out on behalf of Louth County Council and the National Roads Authority in advance of the construction of the M1 Dundalk Western Bypass.

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1 INTRODUCTION

This report refers to an excavation carried out at Site 111A, Newtownbalregan 1.1, in the townland of Newtownbalregan, c.2km to the northwest of Dundalk, Co. Louth. It was carried out as part of an archaeological mitigation programme associated with the Dundalk Western Bypass (DWB). Archaeological fieldwork was directed by David Bayley of Irish Archaeological Consultancy Ltd. (IAC Ltd.) and was funded by Louth County Council and the National Roads Authority.

1.1 Site location

Site 111A is located in Newtownbalregan townland, c.2km northwest of Dundalk (Louth OS sheet number 007). The site is:

- Site 111A, Newtownbalregan 1.1, Excavation Licence 02E1835, route Ch. 20.405, NGR 301949/308018.

The site was identified as a result of the test trenching exercise undertaken by IAC Ltd. in March 2002 (Licence Ref.: 02E0373). The area comprised an undulating landscape with the site located at the bottom of a slight slope.

1.2 The scope of the project

General

Louth County Council proposed to construct a motorway called the 'Dundalk Western Bypass – Northern Link'. The scheme also included ancillary roads and other structures.

The Dundalk Western Bypass – Northern Link connects the existing Dunleer-Dundalk Motorway, which terminated in the area of the N52 Ardee Road, to the N1 Ballymascanlan Roundabout in an arc situated c.2.5km - 3km to the west and north of Dundalk.

The scheme was divided into two sections. Section 1 (7.8km main centre line chainage (Ch)) runs from Ch16.000 to Ch23.870 (the Armagh Road, R177). Work on the southern end of Section 1 was previously commenced so that the main cutting and rough surfacing for the road had been completed to chainage point Ch17.100. The chainage zone Ch16.000 – 17.100 had therefore not been investigated archaeologically under the present contract. Section 2 (2.08km main centre line chainage) ran from the Armagh Road Ch23.870 to the Ballymascanlan Roundabout, Ch25.950.

Therefore the archaeological potential of the route represented a distance of 8.49km (Ch17.100 – 25.950). The route corridor varied between 60m and 200m (not including side roads) and was on average 100m wide. The archaeological site area was thus approximately 85 hectares.

Specific

Site 111A, Newtownbalregan 1.1 was located approximately 800m to the south of the N53 Castleblayney road at chainage 20.405.

Background historical research undertaken as part of the EIS and test trenching programme revealed Newtownbalregan townland to contain two sites listed in the Record of Monuments and Places, namely, a souterrain located to the east of

Newtownbalregan 5 (LH007-24), and a polygonal cist burial located to the south-west of Newtownbalregan 1.1.

The area of excavation to be opened up for archaeological resolution was approximately 40m x 30m

1.3 Circumstances and dates of fieldwork

The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

Topsoil stripping of the area commenced on Tuesday the 10th of December 2002 with a team of one Director and five Assistant Archaeologists and finished on Friday the 10th of January 2003.

After initial bulk stripping the area of excavation was hand cleaned in order to identify potential archaeological remains. All features were subsequently fully excavated and recorded by hand, using the single context recording system with plans and sections being produced at a scale of 1:50 or 1:20 (sections were generally recorded at 1:10) and photographs where necessary. All works were carried out in agreement with the Project Archaeologist and The National Monuments Section of the Department of Environment, Heritage and Local Government (formerly *Dúchas*-The Heritage Service). Samples were taken of any environmental and datable material.

It was agreed in advance that adequate funds to cover excavation, post-excavation, conservation and dating analysis would be made available by Louth County Council. Dating involved pottery analysis through typological study and radiocarbon analysis. The site archive, finds and samples *et cetera* were kept in safe storage by IAC Ltd. during the post-excavation stage.

2 Archaeological and Historical Background

The following archaeological and historical background refers to the wider archaeological landscape through which the DWB passes.

The town of Dundalk lies at the northern end of Dundalk Bay and is the administrative centre of Co. Louth, located in the northeast of Leinster. The area spans two geographical areas. To the west, the rural landscape surrounding the urban district is one of undulating topography, with low drumlins rising to 30-40m from the coastal plain. As with much of Louth, this covers thick strata of Ordovician and Silurian slates, with some rock outcrops (Gosling 1993, 237). To the east of the urban district, the flat, low lying coastal plain is comprised of recent estuarine and alluvial clays and silts, shaped by the sea level changes following the end of the last Ice Age in Ireland c.10,000 years ago.

At the time of the earliest habitation in Ireland, (Early Mesolithic Period: c.7000BC), the sea submerged the area of the town to a depth of 4-5m, although it continued to retreat to its present level until the Late Neolithic/Early Bronze Age period (c.2500BC), replacing the submerged area with salt marshes and tidal flats. At various stages from the 17th century onwards, these areas were improved by reclamation projects.

The proposed route for the Dundalk Western Bypass–Northern Link is located within an area that avoids the major recorded archaeological monuments in the vicinity. This is a particularly rich archaeological landscape but the great majority of known sites lie beyond the perimeter of the original study area. It is important to note, however, that a significant number of sites in this part of Co. Louth survive as crop marks, where the above ground indication of the monument has been destroyed. The recognition of such monuments has often been the result of chance discovery from ploughing and construction work, or by observation from the air where the distinctive traces of the buried features can sometimes be observed. The strong tradition of arable agriculture in the locality has been largely responsible for this occurrence.

2.1 Prehistoric Period (7000BC-AD500)

The archaeological record provides evidence that the locality was occupied from the Late Mesolithic period (c.4200 BC) onwards, with the excavation of Mesolithic shell midden sites with flint material at Rockmarshall, c.5km from the town of Dundalk. Above the ground, a large, granite standing stone known locally as *Dealg Fhinn* (LH 007-118-06) is the only remaining visible reminder of the prehistoric occupation of the area. Another standing stone, on the Bellew's Bridge Road, was removed at the beginning of the twentieth century. The pollen record for this area during the prehistoric period indicates that the indigenous forestry was not cleared and replaced by cereals until farming in Ireland was well into its second millennium (3000BC - 2500BC).

2.1.1 The Neolithic (c.4000-2500BC)

The origins of Neolithic activity in Ireland are disputed. Pollen records reveal forest clearances occurring before our earliest dated Neolithic sites or monuments; however this may be a reflection of some modern dating methods being too crude to discriminate between Early and Late Neolithic settlement rather than an indication of the true chronology (Mitchell & Ryan 1997). A debate ensues over whether the culture evident in Ireland during the Neolithic was a product of a migrating people into Ireland or an indigenous development from Mesolithic populations.

The introduction of certain flora and fauna species, landscape management techniques, traits in architectural construction and domestic crafts, bearing with a striking resemblance to contemporary evidence in Britain has lead some authors to suggest colonisation from outside of Ireland Mitchell & Ryan (1997). Recent studies (Cooney 2000, 13) have suggested that a combination of small-scale movement across the Irish Sea by migrating communities and developments within the existing Mesolithic populations within Ireland resulted in the innovative beginnings of this era.

The vast majority of the archaeological evidence for this period is to be found at the 4-5m (25ft) contour, which reflects the coastline during the maximum post-glacial marine transgression, and it has been suggested that this settlement location would have facilitated the exploitation of the higher ground for farming and the lower ground for summer grazing (Gosling 1993, 242). There is a concentration of Megalithic tombs in the Flurry Valley to the northeast of the site at Newtownbalregan 1.1 (with the nearest example located at Faughart Lower (LH004-062), c.3.2 km to the northeast) and scattered throughout the Cooley peninsula. Archaeological discoveries elsewhere on the DWB scheme revealed Late Neolithic/Early Bronze Age habitation site at Site 115, Newtownbalregan 5 (Bayley, D. forthcoming (c)), located c.0.8km north of Site 111A and the truncated remains of a Late Neolithic/Early Bronze Age house identified at Site 101, Littlemill 1 (Ó Donnachadha, B. forthcoming (d)), located c.2.8km to the south southeast of the site. A collection of pits dating to the Late Neolithic/Early Bronze Age were identified at Site 103, Littlemill 4 & 5 (Ó Donnachadha, B. forthcoming (c)), c.2.45km south of Site 111A (Newtownbalregan 1.1) and a number of Neolithic huts with associated pits were excavated at Site 124, Carn More 1 (Delaney, S. forthcoming (b)), located c.3.06km southwest of the site. A Middle Neolithic to Late Neolithic/Early Bronze Age Beaker habitation was also identified at Site 108, Donaghmore 1 (Ó Donnachadha, B. (e)) which was located c.0.70km south of Site 111A.

2.1.2 The Bronze Age (c.2500-500BC)

From the relatively scant prehistoric archaeological evidence, there are indications that the area was not densely settled until the beginning of the Bronze Age (2400BC). The vast majority of the archaeological evidence for this period is to be found at the 4-5m (25ft) contour, which reflects the coastline during the maximum post-glacial marine transgression, and it has been suggested that this settlement location would have facilitated the exploitation of the higher ground for farming and the lower ground for summer grazing (Gosling 1993, 242). Bronze Age activity is distributed fairly evenly across the study area. These are indicated in the antiquarian drawings of Wright at the Castletown/Kilcurry confluence.

Bronze Age discoveries along the DWB consist of an Early Bronze Age Beaker (2500-2200BC) habitation site at Site 112, Newtownbalregan 2 (Bayley, D. forthcoming (e)), located c.1.5km south of the site. A number of Bronze Age ring-barrows, a cist and a cairn were excavated at Site 127, Carn More 5 (Bayley, D. forthcoming (g)), located c.3km northeast of Site 111A. A total of 3 Bronze Age burnt mounds/*fulachta fiadh* were excavated along the route of the DWB at Site 113, Newtownbalregan 5 (Bayley, D. forthcoming (c)) and at Site 128, Faughart 1, 2 and 3 (Delaney, S. forthcoming (a)). The burnt mound excavated at Site 102, Littlemill 2 dated to the medieval period (890-1250AD). A further 6 burnt mounds/*fulachta fiadh* were excavated by Archaeological Development Services Ltd (ADS Ltd.) as part of the archaeological resolution of the Dunleer/Dundalk Motorway.

2.1.3 The Iron Age (c.500BC-500AD)

There is a marked lack of known Iron Age (500BC-AD500) activity within the surrounding area. The ring barrow identified at Site 131, Donaghmore 7 (Ó Donnachadha, B. forthcoming (g)) is the sole example of a definitive Iron Age site identified through the DWB archaeological investigations. The site consists of a small ring barrow and a single piece of unworked flint was found in the barrow with remains of three charred wooden planks found within the barrow ditch. These were taken for specialist analysis and were submitted for Radiocarbon 14 dating. The dates returned confirmed that the ring barrow belongs to the Iron Age period, specifically the mid-Iron Age based on Cal 120BC-60AD.

2.2 Early Medieval Period (AD500-1169)

The study area lies within a rich early medieval landscape. By far the most numerous type of monument to be recorded within the study area is the 'enclosure' site. This tends to be equated with the dispersed farmstead of the pre-twelfth-century era, known as the ringfort or *rath*. Such sites are classically identified as circular enclosures of c.30m internal diameter with a series of earthen banks and fosses outside to define the boundary and protect the complex. Site 13 on the DWB for example was identified as a possible ringfort in the EIS (March 2000). These were the homes of farmers who practiced a mixed-farming economy. Ringforts are one of the most common site types in north Co. Louth. Many have had their surface remains destroyed, with the banks ploughed back into the soil. To the north of the northern end of Section 1 there is a concentration of ringforts or earthworks.

Site 114 at Newtownbalregan 6 (Bayley, D. forthcoming (d)) consists of a ringfort and souterrain. The ringfort or rath is considered to be the most common indicator of settlement during the early medieval Period (c.500AD – c.1100AD). The most recent study of the ringfort (Stout 2000) has suggested that there are a total of 45,119 potential ringforts or enclosure sites throughout Ireland. They are typically enclosed by an earthen bank and exterior ditch, and range from 25m to 50m in diameter. The smaller sized and single banked type (univallate) were more likely to be home to the lower ranks of society while larger examples with more than one bank (bivallate/trivallate) housed the more powerful kings and lords. At Site 124, Carn More 1 (Delaney, S. forthcoming (b)), (Area 1) a ringfort identified in the RMP as LH004-067 was excavated in advance of the motorway's construction, with the RMP originally listing the monument as a circular enclosure.

Souterrains are artificial underground structures, usually built of dry stone walling and comprising of passages and chambers with creeps connecting them. Souterrains are generally regarded as having had a defensive or protective function, as evidenced by the complex construction of many of the sites, with narrow winding passages, deliberate obstructions and small chambers. Raiding was endemic to early medieval society, and souterrains are thought to have served to house portable valuables and non-combatants during a raid. There is a previously recorded souterrain located 30m to the east of the CPO line at Ch17.640 (LH007-071).

The historical sources for the early medieval period indicate that the main population group in north Louth was the *Conaille Muirtheimne*. They controlled the areas of *Cuailgne* (Cooley) and *Mag Muirtheimne* (Plain of Muirtheimne)-corresponding to the area south of Dundalk, roughly equating with the modern baronies of Lower and Upper Dundalk. It has been suggested (Gosling 1993, 46) that the ancient boundaries of this kingdom may coincide with the dense concentration of souterrains in north Louth. Though nominally a branch of the *Ulaid*, who had their capital at *Eamain Mhaca* or Navan Fort, Co. Armagh, the *Conaille Muirtheimne* appear to have been subject to the kingdom of *Brega* at the time of its greatest political cohesion, during the first half of the 7th century A.D. Their earliest appearance in the annals is in

688 A.D. as allies of the Knowth branch of the *Síl nÁeda Sláine* at the battle of *Imblech Pich* (Emlagh, Co. Meath), which was a key event in the political fragmentation of the *Síl nÁeda Sláine* dynasty. They were subsumed by the *Airgialla* in the early 12th century.

The *fulacht fiadh* identified at Site 102, Littlemill 2 (Ó Donnachada, B. forthcoming (f)) was Carbon 14 dated to Cal 890AD -1250AD (968 \pm 85BP). Site 102, Littlemill 2 is roughly circular in shape and it is suggested that these sites which are identified as early medieval and medieval in dating, tend to be circular to oval in shape with no evidence for pit lining (O'Neill, pers.comm, 2007). The example at Littlemill 2, however was lined with wooden planks.

2.3 Medieval Period (AD1169-1700)

The motte and bailey at Castletown (LH 007-118-07) located c.2km west of Newtownbalregan 1.1 represents the initial phase of Anglo-Norman activity in the area. The decision to create a motte and bailey as an initial Anglo-Norman base was the easiest way to construct a headquarters, in contrast to the construction of stone castle structures which required substantial time, materials and organisation. It is not the case however that these constructions were always replaced by a stone structure. Although there are some suggestions that John de Courcy was responsible for this development, it is generally accepted that it represents the initial headquarters of the de Verdon family in their new territory. The Anglo-Normans were responsible for the construction of a network of towns throughout Ireland with Louth being the most urbanised county.

The land in Castletown and the Dundalk environs was granted to the Anglo-Norman Bertram de Verdon following his arrival in 1185, and corresponds to the barony of Upper Dundalk (Gosling, 1993, 252). The de Verdon estate passed onto the Bellews. It was at this time that many of the tower houses were constructed, and the Bellews contributed two large examples in 1472 and 1479, of which only the later survives, in the grounds of St. Louis convent (LH007-11801). The earlier tower house is known to have stood at Castletown cross (LH007-11803), but no traces of the tower house survive above ground. In 1429, Henry IV introduced a £10 subsidy to encourage the King's 'liege men' to build tower houses in the Pale, under the condition that they were built within ten years. This venture was so successful that twenty years later a limit was imposed on their construction. In Counties Louth, Kildare and Meath, the towers were mostly concentrated along the borders of the Pale (Davin 1982). The surviving tower house at Castletown (LH007-11801), most likely functioned as the centre of the Bellew manor of Dundalk during the 15th century. Garstin's map of 1655 shows it protected by a bawn wall, which also enclosed outhouses.

For information of the Anglo-Norman land ownership we are dependent on documentary sources, and in Louth this information is recorded in the 'Dowdall deeds'. The lack of documentary sources and archaeological excavations in the area has led to large gaps in the record regarding the size of the Anglo-Norman settlement and how it was laid out. By the 13th century it seems that Castletown had its own church and burgesses. Garstin's map does point out the existence of burgage plots and streets in the vicinity of Mill road and Castletown cross. A watermill, most likely attached to the manor, is known from documentary sources although its precise location is not known. The Anglo-Normans were responsible for the network of towns throughout the country, with Louth being the most heavily urbanised county (Barry 1987, 118).

At this time however the new town of Dundalk, which lies c.2km to the east of the motte, developed as the major urban centre. This was due to its market centre and

port in addition to its more strategic sitting on the major routeway linking Dublin with Ulster. It is probable that another factor influencing the move of the de Verdon's was the nature of the topography of the general area. The unsatisfactory nature of the river at the Castletown location must have made it inaccessible to shipping even in the late 12th century. The new town also had the advantage of considerable natural defences. The site of the new town, which was to grow into the modern town of Dundalk, was thus better situated than Castletown from a commercial and a defensive perspective. As Dundalk developed and became the focus for Anglo-Norman settlement in the area, Castletown fell into decline and Dundalk became the economic heart of the Lordship. The precise date of the foundation of the "*newtown*" was established is unclear. However by the late 13th century surviving property deeds make the distinction between the late 12th century settlement at Castletown and the Newtown or '*nove ville de Dundalc*'.

As a result of the low-lying nature of the surrounding landscape and the form of the gravel ridge on which the Newtown (Dundalk) was located, the town developed a markedly linear aspect which is still apparent today.

2.4 Post-Medieval Period (1700-1900AD)

Post-medieval archaeological remains identified in the study area relate to industrial structures particularly mills and kilns surrounding the Castletown and Kilcurry River waters, with these structures usually being served by a millrace. A mill and associated race occur near to the Castletown-Kilcurry confluence. A quarry for limestone is situated to the north of the corridor. Small-scale extraction cuts are also known sunk into natural rock outcrops such as the one at Ch19.200.

Site 102 at Littlemill 2 (O Donnachadha, B. forthcoming (f)) contained the remains of a post-medieval structure, which cartographic evidence demonstrates supports its existence at this location since the first edition OS map dating to 1836. It is probable that this structure was a small vernacular style residence accompanied by a small farmyard as was typical of the area and indeed most of Ireland during the 19th century.

At Site 119, Balregan 3 & 4 (Delaney, S. forthcoming (d)), the subsurface remains of a north-south oriented masonry structure was recorded. The foundations measured 21m in length and 6.5m in width and consisted of two rooms. The building appears to have been of 19th century construction based on the artefactual evidence and identifiable construction methods, however, the structure is not depicted on the 1835 or the 1908-9 1:10, 560 scale Ordnance Survey editions. Anecdotal evidence from a local landowner notes that a structure formerly located at this site was demolished around the mid 20th century; it is likely the building dates from the later 19th century and fell out of use at the same time as the Scotch Green Mill.

Site 118, Balregan 5 & 6 (Delaney, S. forthcoming (e)), contained the remains of a post-medieval water mill, which even in its ruinous condition showed a complete example of this form. Millrace, millpond, main sluices, internal wheel race and a number of main rooms along with the access road and access road and yard for the mill buildings were present.

3 THE EXCAVATION

3.1 Introduction

The excavation of Site 111A, Newtownbalregan 1.1, was undertaken as part of the archaeological mitigation for the DWB in the townland of Newtownbalregan.

3.2 Methodology

Topsoil stripping of the site commenced on Tuesday 10th December 2002 with a team of one Director and five Assistant Archaeologists and finished on Friday 10th January 2003.

The topsoil was removed by a machine equipped with a flat toothless bucket under strict archaeological supervision. After initial bulk stripping the area of excavation was hand cleaned in order to identify potential archaeological remains. All features were subsequently fully excavated and recorded by hand, using the single context recording system with plans and sections being produced at a scale of 1:50 and 1:20 (sections were recorded generally at 1:10) and photographs where necessary. All works were carried out in agreement with the Project Archaeologist and the National Monuments Section (formerly *Dúchas*-The Heritage Service) of the Department of Environment, Heritage and Local Government (DoEHLG). All contexts are described in Appendix 1.

3.3 Legends and Brackets

In the following text, the authors have used three types of brackets:

- { } = These enclose Subgroup numbers.
- () = These enclose Deposit numbers
- [] = These enclose both Cut and Masonry Structure numbers

CONTEXT KEY;

- prof = profile
- NSEW = Compass points, Eg: 'N-S' = North-South oriented feature
- All dimensions are given in metres
- d/l/w = depth/width/length
- s/m/lg = small/medium/large
- ang/sub-ang/rou/sub-rou = refer to stones, Eg: 's sub-ang' = small sub-angular stone
- mixed = ang + sub-ang + rou + sub-rou
- Dk/Lt = dark/light
- mod = moderate/moderately
- freq/occ = frequent/occasional
- ch = charcoal
- Hb/Ht = Human bone/teeth
- Ab/At = Animal bone/teeth
- frags/fls = fragments/flecks
- vert = vertical
- constr = construction
- sk = skeleton
- t'd/unx/s'd = truncated/unexcavated/segmented
- w/- = with
- pres = preservation

PERIOD KEY:

- PH: Prehistoric
- EM: Early Medieval
- MD: Medieval
- PM: Post-medieval
- MOD: Modern

4 EXCAVATION RESULTS

STRATIGRAPHY

4.1 GROUP 1: Natural Drift Geology

4.1.1 SUBGROUP {1000}: Natural Subsoil

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
2	Site	n/a	n/a	Natural	Brown orange sandy, silty clay

Finds:

None

Interpretation:

The Natural drift geology in subgroup {1000} was uniform in colour and compact and generally consisted of firm yellowish brown silty clay.

GROUP 1 DISCUSSION: Natural Drift Geology

The Newtownbalregan sites are on an agriculturally productive area of land that undulates between c.20m OD and c.40m OD that surrounds Dundalk. Such a topographical location would be ideal for agricultural habitation at any period. Site 111A, Newtownbalregan 1.1, is located in a hollow on a south facing gentle slope, approximately 130m south of a stream, on an agriculturally productive area of land at c.34m OD, c.2km to the west of Dundalk.

The DWB in this area crosses a zone of prime agricultural land, with soils in the category of 'Wide Use Range' being very suitable for grassland and tillage enterprises. In general terms the ground conditions comprise typically 3m to 5m of glacial till over bedrock. The glacial nature of the sand and stone-strewn natural subsoil ensures the area is well drained. Bedrock consists of Silurian siltstones, mudstones and sandstones, and locally Dinatian limestone.

4.2 GROUP 2: Bronze Age Activity

4.2.1 SUBGROUP {1001}: Hearth and 'Rake - Out' Material

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
3	0/0	n/a	n/a	Fire 'rake-out'	Charcoal + lt brown clay, 3.5l x 1.2w x 0.04d
5	0/0	n/a	C9	Channel	Linear in plan, shallow U-shaped prof, 0.05d x 1.17l x 0.22w, SW-NE
7	10/0	n/a	C8, C21, C23, C24	Kiln	Oval in plan, undercut on N+W sides flat base, 0.43d x 1.93l x 1.29w, NE-SW
8	10/0	C7	n/a	Natural silting	Lt brown, loose clayey silt, occ m
9	0/0	C5	n/a	Nat silting	Clay- poss redeposited natural, freq ch fl
21	10/0	C7	n/a	Deliberate back fill	Very dk brown/black, loose clay
23	10/0	C7	n/a	Fire debris	Intermittent, thin layer of charcoal just above natural
24	10/0	C7	n/a	Deliberate backfill	Dark brown, loose clay, with freq stone inclusions

Finds:

None

Interpretation:

The subgroup {1001} was an area of indeterminate industrial activity. The Pit [C7] (Plate 4) had undercut edges on the north-west side, which indicated a sunken hearth, probably for heating charcoal. The basal fill of [C7], (C23), comprised a thin layer of charcoal fire debris. The pit [C7] was deliberately backfilled with (C21) and (C24) (Plate 3) shortly after it fell into disuse, before any natural silting had occurred. Charcoal samples retrieved from (C24) were identified as oak (*Quercus spp*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) (Appendix 2.1). Leading from hearth [C7] in a southwest direction was a shallow channel [C5] that connected hearth [C7] to a spread of charcoal-rich clay [C3]. It seems likely that the spread [C3] was formed by material that was raked out of hearth [C7] along the channel [C5]. It is most likely that the channel [C5] was formed over a long period by repeated raking over the same area, rather than being intentionally dug.

4.2.2 SUBGROUP {1002}: Pit

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
14	0/0	n/a	C15	Pit	Oval in plan, mod steep sides irreg concave base, 0.18d x 0.48l x 0.26w
15	0/0	C14	n/a	Nat silting	Med brown, silty sand +redeposited nat, occ ch fl, rare s sub-ang

Finds:

None

Interpretation:

The pit [C14] in subgroup {1002} was an oval pit that had naturally silted up with (C15). Inclusions of washed-in charcoal and its proximity to the spread [C3] in subgroup {1001} could suggest a possible association with the activity around the subgroup {1001}.

4.2.3 SUBGROUP {1003}: Pit

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
25	10/10S	n/a	C26, C27	Pit	Circular in plan, mod steep sides, flat base generally, 0.20d x 0.98l x 0.92w
26	10/10S	C25	n/a	Nat silting	Med brown, silty sand, ch fl, rare s sub-ang,
27	10/10S	C25	n/a	Deliberate backfill	Grey clay, ch fl, mod m-l ang+sandstone flecks, similar colour+texture to c16

Finds:

C	Find No.	Material	Period	Classification	Comments
27	02E1835:27:1	Flint		Abraded lump	
27	02E1835:27:2	Flint		Thermal flake	

Interpretation:

The pit [C25] in subgroup {1003} was filled deliberately with (C27) and then naturally silted up with (C26). The basal fill (C27) of the pit comprised a grey, silty clay with a high ash content. Inclusions of washed-in charcoal and the similar nature of the fill (C25) to spread (C16) may suggest a possible association with the subgroup {1006} described below. This suggested that the features were contemporaneous; however it could not be confirmed due to the lack of diagnostic material.

4.2.4 SUBGROUP {1004}: Two Pits

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
10	10/0	n/a	C11,C19	Pit	Sub-circular in plan, gently sloping sides, concave base, 0.10d x 0.60l x 0.49w
11	10/0	C10	n/a	Deliberate fill	Med brown, silty clay, ch fl, occ s ang+sub-ang, some showing effects of heating
19	10/0	C10	n/a	Deliberate fill	Grey clay, occ ch fl, freq m+s sub-ang, heat-affected sandstone
28		n/a	C44, C45	Pit	Oval in plan, U-shaped prof, concave base, 0.20d x 1.70l x 1.30w N-S
44	10/0	C28	n/a	Deliberate fill	Mid brown grey, loose clayey silt, very freq s+med sub-ang, occ l sub-ang, occ ch
45	10/0	C28	n/a	Fire debris	Ch, occ med flat sub-ang

Finds:

C	Find No.	Material	Period	Classification	Comments
44	02E1835:44:1	Flint		Thermal flake	

Interpretation:

The pits [C10] (Plate 5) and [C28] (Plate 6) in subgroup {1004} were sealed by the spread (C16), and appear to have had an industrial function. The basal fill of pit [C28], (C45), was a layer of fire debris, but there was no evidence of *in situ* burning, such as fire reddened clay, around the edges of the cut which suggests that (C45) was burned elsewhere. Charcoal samples retrieved from the fill (C45) were identified as oak (*Quercus spp*) and alder (*Alnus glutinosa*) (Appendix 2.1). The upper fill of [C28] was a deliberately dumped layer of stones with a clay mix.

The Pit [C10] was deliberately filled with (C11) and (C19). Although no diagnostic material was recovered from the fills of either of these pits, subgroup {1004} is one of the stratigraphically earlier subgroups on site.

4.2.5 SUBGROUP {1005}: Four Stakeholes

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
29	20/10S	n/a	C30	Stakehole	Circular in plan, near-vertical sides, uneven blunt, tapered base, 0.12d x 0.09l x 0.09w

30	20/10S	C29	n/a	Deliberate backfill	Grey blackmod loose silty clay, freqch, mod s sub-ang, med-l stones at base + side
31	20/10S	n/a	C32	Stakehole	Circular in plan, U-shaped prof, base concave, 0.10d x 0.10l x 0.10w
32	20/10S	C31	n/a	Deliberate backfill	Grey black, mod loose silty clay, freq ch, mod s sub-ang
33	20/10S	n/a	C35	Stakehole	Circular in plan, steep sides, base concave, 0.07d x 0.07l x 0.07w
34	20/10S	n/a	C36	Stakehole	Circular in plan, vertical sides, flat base, 0.17d x 0.08l x 0.08w
35	20/10S	C33	n/a	Deliberate backfill	Grey black, mod loose silty clay, freq ch, mod s sub-ang, larger stone on side
36	20/10S	C34	n/a	Poss burnt post	Grey black, mod loose silty clay, freq ch, mod s sub-ang

Finds:

None

Interpretation:

All four stakeholes [C29], [C31], [C33] and [C34] in the subgroup {1005} appeared to be sealed by the spread (C16) (Plate 7 & 8). The four stakeholes form an L-shape, with [C33] and [C34] at the corner (Plate 9). If a fifth stakehole existed to complete a rectangular structure, it would have been located in pit [C28] in subgroup {1004}, and may have been disturbed/removed by the digging of pit [C28] in {1004}. The shallowness of stakehole [C33] and its proximity to stakehole [C34] might suggest that the stake was originally driven in at [C33], but when resistance was encountered (a stone was at the base of [C33] preventing the stake being driven any further), it was removed and driven in more securely to [C34].

The fills of each stakehole were all very similar, consisting of a charcoal-rich grey silty clay. It is possible that the stakeholes were filled with debris from the later industrial activity associated with group {1006}. It is also possible that the stakeholes were part of a frame, which was to support the roof of the postulated oven, overlying the oven in subgroup {1006}. Such an arrangement of stakeholes underlying oven floors is typical of these features, with the stakes removed when the roof was set and the holes left in the oven floor were then repaired.

4.2.6 SUBGROUP {1006}: Metalled surface/ oven/kiln floor

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
6	10/0	n/a	n/a	Metalled surface	Stones, avg 0.10 x 0.07 x 0.03 in a matrix of ch-rich grey brown silty clay. 4.8l x 2.3w x 0.12d
16	10/0	n/a	n/a	Industrial debris	Irreg in plan, lt orange grey, silty clay, mod ch fl+ occ ch frag. 8.2l x 5.25w x 0.12d
17	10/0	n/a	n/a	Deliberate deposit	Circular in plan lt orange brown, silty clay, mod ch fl, mod s sub-ang. 1l x 0.5w x 0.1d
18	10/0	n/a	n/a	Poss hearth	Oval in plan, mod compact black ch-rich silty clay, freq m sub-ang+mod sub-ang. 2l x 1.3 w x 0.1d.
41	10/10S	n/a	n/a	Spread w/ poss burning	Irreg in plan, blue brown grey, soft silty clay, freq ch, rare s-med ang. 2.25l x 0.9w x 0.03d

Finds:

C	Find No.	Material	Period	Classification	Comments
16	02E1835:16:1	Flint	Bronze Age?	Flake	
16	02E1835:16:2	Flint	Bronze Age?	Thermal flake	
16	02E1835:16:3	Flint	Bronze Age?	Abraded lump	
16	02E1835:16:4	Flint	Bronze Age?	Abraded lump	

16	02E1835:16:5	Flint	Bronze Age?	Thermal flake	
16	02E1835:16:6	Flint	Bronze Age?	Thermal flake	
16	02E1835:16:7	Flint	Bronze Age?	Abraded lump	
16	02E1835:16:8	Flint	Bronze Age?	Abraded lump	
16	02E1835:16:9	Flint	Bronze Age?	Thermal lump	
18	02E1835:18:1	Flint	Bronze Age?	Abraded lump	
41	02E1835:41:1	Flint	Bronze Age?	Abraded lump	
41	02E1835:41:2	Flint	Bronze Age?	Abraded lump	

Interpretation:

The subgroup {1006} was the main area of activity on site and stratigraphically one of the latest. It comprised the remains of a metal surface (C6) 4.8m x 2.3m x 0.12m deep, mostly consisting of greywacke stone, with a centrally located hearth (C18) 2m x 1.3m x 0.1m deep. Immediately south of hearth (C18) was a layer of re-deposited natural (C17). These three features overlay spread (C16), a large area of grey silty clay with a high ash content and 'pockets' of charcoal.

The base of the construction cut was lined with clay (deposit (C16)) and over this the base of the oven was constructed (surface (C6)). The oven walls were built up to enclose the oven space (typically forming a dome shape) and the hot embers were placed through a door hole, into the centre of the oven (hearth (C8)). To ensure that the oven did not smoke excessively there was a second hearth near the main oven in order to heat charcoal prior to it being placed in the main oven. Even so smoke would have been forced through the oven floor to char and blacken the underlying deposit (deposit (C16)).

Deposit (C41) has been interpreted as 'rake-out' from the main oven, but had been truncated by a post-medieval field drain [C47]. No diagnostic material was recovered from any of these features, nor was any material recovered to suggest what type of industrial activity was carried out on site. However, the large size of the oven would tend to suggest that this was an early form of lime slaking oven or corn-drying kiln.

Charcoal samples were taken from the hearth (C18) in subgroup {1006} and were identified as ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) (Appendix 2.1). The charcoal returned a date of 3320+/-41 BP (WK – 18557) (Appendix 2.2). The 2 Sigma calibrated results from this sample produced a date of Cal 1700–1500 BC. The site was originally interpreted as a medieval to post-medieval malting or 'corn drying' or lime slaking oven but the radiocarbon date obtained from the charcoal samples clearly indicate that this feature dates to the Middle Bronze Age period.

GROUP 2 DISCUSSION: Undated Industrial Activity

Group	Subgroup	Subgroup type	Period by finds/stratigraphy	Period by interpretation	Group Interpretation
2	1001	Hearth + rake out		Bronze Age	Agricultural activity: ?lime slaking
2	1002	Pit		Bronze Age	Agricultural activity: ?lime slaking
2	1003	Pit		Bronze Age	Agricultural activity: ?lime slaking
2	1004	Two pits		Bronze Age	Agricultural activity: ?lime slaking
2	1005	Four stakeholes		Bronze Age	Agricultural activity: ?lime slaking
2	1006	Oven/kiln floor		Middle Bronze Age	Agricultural activity: ?lime slaking

The main feature on the site was the oven/kiln in subgroup {1006}. These ovens were typically constructed in fields and built in work hollows. One interpretation could

be that the base of the work hollow (which had been subsequently truncated) was used for the cutting of two fairly large but shallow pits in subgroup {1004}. Associated with this were four stakeholes in subgroup {1005} that appear to have supported some form of structure. It is possible that the stakeholes supported some form of scaffolding to help erect the oven roof that would have been built over base in subgroup {1006}. The function of pits in subgroup {1004} remains unknown.

The base of the construction cut was then lined with clay (deposit **(C16)** in subgroup {1006}) and over this the base of the oven/kiln was constructed (surface **(C6)** in subgroup {1006} - it survived 4.8m x 2.3m in plan, the actual floor perhaps originally around 5m x 2.5m). The walls are built up to enclose the oven/kiln space, perhaps partly supported on stakes in subgroup {1005}. When the roof had set, or after the first firing the oven floor stakeholes repaired.

To fire the oven/kiln, hot embers/charcoal were placed through a door-hole, into the centre of the oven (hearth area **(C8)** in subgroup {1006}). To ensure the oven did not smoke excessively (there would have been no vent) there was a second hearth {1001} located nearby to the main oven, in order to heat charcoal prior to it being placed in the main oven. Even so smoke was often forced through the oven floor to char and blacken the underlying deposit (deposit **(C16)** in subgroup {1006}). Rake out from repeated oven use was recorded as **(C41)** in subgroup {1006}. The position of the rake out would imply the oven door was located on the western side.

No diagnostic material was recovered from any of these features, nor was any material recovered to suggest what type of industrial activity was carried out on site. However, the large size of the kiln would tend to suggest that this was an early form of lime slaking or corn drying kiln.

Charcoal samples were taken from the hearth **(C18)** in subgroup {1006} and were identified as ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) (Appendix 2.1). The charcoal returned a date of 3320+/-41BP (WK – 18557) (Appendix 2.2). The 2 Sigma calibrated results from this sample produced a date of Cal 1700–1500 BC. The site was originally interpreted as a medieval to post-medieval malting or 'corn drying' or lime slaking oven but the radiocarbon date obtained from the charcoal samples clearly indicate that this feature dates to the Middle Bronze Age period.

The oven/kiln **(C18)** in subgroup {1006} was stratigraphically the latest feature on site. Although no datable material was retrieved from the earlier features, it is probable that they were directly associated with the oven/kiln.

4.3 GROUP 3: Post-Medieval Activity

4.3.1 SUBGROUP {1007}: Post-medieval drainage ditch

Contexts:

C	Area	Fill of	Filled with	Interpretation	Description
46		n/a	C47	Land drain	U-shaped profile 0.3d x 0.6w
47		C46	n/a	Natural silting	Lt brown silty clay. Occ ch incl

Finds:

None

Interpretation:

The subgroup {1007} comprised a linear ditch [C46], naturally silted up with (C47). It represented efforts to drain the field, probably in the post-medieval period. It truncated the spreads (C16) and (C41).

GROUP 3 DISCUSSION: Post-Medieval Activity

The cut [C46] in subgroup {1007} comprised of a naturally silted linear ditch. It represented efforts to drain the field, probably in the post-medieval period. The whole site was overlain by modern, plough-turned topsoil.

4.4 Group 4: Topsoil

4.4.1 SUBGROUP {1008}: Topsoil

Context:

C	Area	Fill of	Filled with	Interpretation	Description
1	Site	n/a	n/a	Topsoil	Mid brown sandy clay, mod firm, freq s, m, lg mixed, mod ch fls & frags

Finds:

C	Find No.	Material	Period	Classification	Comments
1	02E1835:1:1	Flint		Possible gunflint	
1	02E1835:1:2	Flint		Scraper	
1	02E1835:1:3	Flint		Abraded lump	
1	02E1835:1:4	Flint		Abraded lump	
1	02E1835:1:5	Flint		Abraded lump	
1	02E1835:1:6	Flint		Abraded lump	
1	02E1835:1:7	Flint		Abraded lump	

1	02E1835:1:8	Flint		Thermal flake	
1	02E1835:1:9	Flint		Thermal lump	
1	02E1835:1:10	Flint		Flaked chunk	
1	02E1835:1:11	Flint		Abraded lump	
1	02E1835:1:12	Flint		Abraded lump	
1	02E1835:1:13	Flint		Knapped debitage	
1	02E1835:1:14	Flint		Abraded lump	
1	02E1835:1:15	Flint		Abraded lump	
1	02E1835:1:16	Flint		Thermal lump	
1	02E1835:1:17	Flint		Thermal lump	
1	02E1835:1:18	Flint		Abraded lump	
1	02E1835:1:19	Flint		Thermal lump	
1	02E1835:1:20	Flint		Thermal flake	
1	02E1835:1:21	Flint		Thermal lump	
1	02E1835:1:22	Flint		Abraded lump	
1	02E1835:1:23	Flint		Bipolar complete	
1	02E1835:1:24	Flint		Platform: core trimming	
1	02E1835:1:25	Flint		Knapping debitage	
1	02E1835:1:26	Flint		Bipolar complete	
1	02E1835:1:27	Flint		Platform complete	
1	02E1835:1:28	Flint		Thermally split pebble	
1	02E1835:1:29	Flint		Unworked	
1	02E1835:1:30	Flint		Abraded lump	
1	02E1835:1:31	Flint		Abraded lump	
1	02E1835:1:32	Flint		Abraded lump	
1	02E1835:1:33	Flint		Abraded lump	
1	02E1835:1:34	Flint		Abraded lump	
1	02E1835:1:35	Flint		Abraded lump	
1	02E1835:1:36	Flint		Abraded lump	
1	02E1835:1:37	Flint		Abraded lump	
1	02E1835:1:38	Flint		Abraded lump	
1	02E1835:1:39	Flint		Abraded lump	
1	02E1835:1:40	Flint		Abraded lump	
1	02E1835:1:41	Flint		Abraded lump	
1	02E1835:1:42	Flint		Abraded lump	
1	02E1835:1:43	Flint		Abraded lump	
1	02E1835:1:44	Flint		Abraded lump	
1	02E1835:1:45	Flint		Abraded lump	
1	02E1835:1:46	Flint		Abraded lump	
1	02E1835:1:47	Flint		Abraded lump	
1	02E1835:1:48	Flint		Abraded lump	
1	02E1835:1:49	Flint		Abraded lump	
1	02E1835:1:50	Flint		Abraded lump	
1	02E1835:1:51	Flint		Abraded lump	
1	02E1835:1:52	Flint		Abraded lump	
1	02E1835:1:53	Flint		Abraded lump	
1	02E1835:1:54	Flint		Abraded lump	
1	02E1835:1:55	Flint		Abraded lump	
1	02E1835:1:56	Flint		Abraded lump	
1	02E1835:1:57	Flint		Thermal lump	
1	02E1835:1:58	Flint		Thermal lump	
1	02E1835:1:59	Flint		Thermal lump	
1	02E1835:1:60	Flint		Thermal lump	
1	02E1835:1:61	Flint		Thermal lump	

Interpretation:

The topsoil was fairly uniform in colour, compaction and depth across the site. A thumbnail scraper (02E1835:1:2) and possible gunflint blank (02E1835:1:1) were recovered from the topsoil (Figure 8).

4.5 SYNTHESIS

Open Area 1: Group 1, Natural geology and topography

The Natural drift geology in subgroup {1000} was uniform in colour and compaction and generally consisted of firm yellowish brown silty clay.

The site was located in a hollow on a south facing gentle slope, approximately 130m south of a stream, on an agriculturally productive area of land at c.34m OD, c.2km to the west of Dundalk.

Open Area 2: Group 2, Bronze Age activity 2400-500BC

The main feature on the site was the oven in subgroup {1006}. These ovens were typically constructed in the fields and built in work hollows. One interpretation could be that the base of the work hollow (which had been subsequently truncated) was used for the cutting of two fairly large but shallow pits in subgroup {1004}. Associated with this were four stakeholes in subgroup {1005} that appear to have supported some form of structure. It is possible that the stakeholes supported some form of scaffolding to help erect the oven roof that would have been built over base in subgroup {1006}. The function of pits in subgroup {1004} is not known.

The base of the construction cut was then lined with clay (deposit **(C16)** in subgroup {1006}) and over this the base of the oven/kiln was constructed (surface **(C6)** in subgroup {1006} - it survived 4.8m x 2.3m in plan, the actual floor perhaps originally around 5m x 2.5m). The walls were built up to enclose the oven/kiln space, perhaps partly supported on stakes in subgroup {1005}. Once the roof had set, or after the first firing, the oven floor stakeholes were repaired.

To fire the oven/kiln, hot embers or charcoal was placed through a door hole, into the centre of the oven (hearth area **(C8)** in subgroup {1006}). To ensure the oven did not smoke excessively (there would have been no vent) there was a second hearth in subgroup {1001} located nearby to the main oven, in which to heat charcoal prior to it being placed in the main oven.

Even so, smoke was often forced through the oven floor to char and blacken the underlying deposit (deposit **(C16)** in subgroup {1006}). Rake out from repeated oven use was recorded as **(C41)** in subgroup {1006}. The position of the rake out would imply the oven door as on the south-western side.

No diagnostic material was recovered from any of these features, nor was any material recovered to suggest what type of industrial activity was carried out on site. However, the large size of the oven/kiln and the lack of seeds in the rake out would tend to suggest that this was an early form of lime slaking kiln.

Open Area 3: Group 3, Post-medieval activity and topsoil

The cut **[C46]** in subgroup {1007} comprises a naturally silted linear ditch. It represents efforts to drain the field, probably in the post-medieval period. The whole site was overlain by modern, plough turned topsoil.

5 DISCUSSION

5.1 Realisation of the original research aims

This section examines the extent to which preliminary assessment of the results of the excavations reveals how the original research aims have been or can be answered.

Original Research Questions (**ORQ**) were prepared after the results of the test-trenching exercise were known and before the rescue excavations began. The following are the Original Research Questions relating to each the excavation at site 111A Newtownbalregan 1.1 and Responses (**R**) based on preliminary assessment of the site data.

ORQ 1: *What is the full nature of the site at Newtownbalregan 1.1? Are there any buildings present, if so what were the construction methods and are there different phases of construction and use? If there are no buildings what was the site used for?*

R: Site 1.1 consisted of what appeared to be a circular stone surface that measured 4.80m by 2.30m, with a centrally located hearth. This hearth measured 2.00m in length, 1.30m in width and was 0.10m deep. The surface was truncated on its northern side by a post-medieval field drain. It is possible that this stone surface functioned as a metalled surface for an industrial area. To the south and southwest of the stone surface, were three pits. The westernmost pit measured 0.48m in length, 0.28m in width and was 0.18m in depth. The pit to the south measured 0.62m in length, 0.33m in width and 0.09m in depth. The third pit measured 0.98m in length, 0.92m in width and was 0.20m deep. To the west of the stone surface was a second hearth-type feature. It measured 1.93m in length, 1.29m in width and was 0.43m in depth, and it is believed that this feature may have functioned as a kiln. It contained considerable evidence of *in situ* burning, and there were thin spreads of charcoal to the north and southwest of this pit. There appears to have been at least two phases of activity on the site, as the floor surface sealed a layer of grey silty clay, which in turn sealed two pits and three stakeholes. The first pit measured 0.60m in length, 0.49m in width and was 0.10m deep. The second pit measured 1.70m in length, 1.30m in width and was 0.20m deep. The three stakeholes were located 1.40m to the north and north-east of this pit and were generally between 0.07 and 0.10m in diameter, and between 0.10m and 0.17m deep.

ORQ 2: *What are the dates of occupation and how does the site change through time?*

R: No secure diagnostic material was recovered during the excavation of Site 1.1, so dating the stone surface or any of the pits was not possible during the excavation. It has been suggested that this surface may be related to a kiln, as a pit to the west of this surface contained evidence of *in situ* burning. The fact that the stone surface sealed two shallow pits and a pair of stakeholes suggests that there was at least two separate phases of activity on the site. It was not possible to show which phase of activity the pits on the exterior of the floor surface belonged to. Charcoal samples were taken from the hearth (**C18**) in subgroup {1006} and were identified as ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) (Appendix 2.1). The charcoal returned a date of 3320+/-41BP (WK – 18557) (Appendix 2.2). The 2 Sigma calibrated results from this sample produced a date of Cal 1700 – 1500BC indicating that the kiln/oven (**C18**) in subgroup {1006} dated to the Early/Middle Bronze Age.

ORQ 3: *Are there areas where different activities were undertaken?*

R: The site is un-enclosed and undefended. The only evidence of activity on site relates to the kiln, so the site can be described as an area of industrial activity. The stream to the north of the site area presumably provided a close and constant water source during the period of occupation.

ORQ 4: *What is the nature of the finds and the environmental evidence? What type of evidence is present here and do they give indications for specific activities?*

R: The finds consisted solely of flint flakes and debitage. No material of diagnostic value was recovered from any of the features.

ORQ 5: *Is there any evidence for burial or ritual activity?*

R: No evidence of ritual or burial activity was recorded.

5.2 Conclusions

From the relatively scant prehistoric archaeological evidence, there are indications that Co. Louth was not densely settled until the beginning of the Bronze Age (2500BC). The vast majority of the archaeological evidence for this period is to be found at the 4-5m (25ft) contour, which reflects the coastline during the maximum post-glacial marine transgression, and it has been suggested that this settlement location would have facilitated the exploitation of the higher ground for farming and the lower ground for summer grazing (Gosling 1993, 242). Bronze Age activity is distributed fairly evenly across the study area. These are indicated in the antiquarian drawings of Wright at the Castletown/Kilcurry confluence.

Site 111A, Newtownbalregan 1.1 is situated in a rich prehistoric landscape and other Bronze Age discoveries along the DWB consist of an Early Bronze Age Beaker (2500-2200BC) settlement at Site 112, Newtownbalregan 2 (Bayley, D. forthcoming (e)), located c.1.5km south of the site. A number of Bronze Age ring-barrows, a cist and a cairn were excavated at Site 127, Carn More 5 (Bayley, D. forthcoming (g)), located c.3km northeast of Site 111A. A total of 3 Bronze Age burnt mounds/*fulachta fiadh* were excavated along the route of the DWB at Site 113, Newtownbalregan 5 (Bayley, D. forthcoming (c)) and at Site 128, Faughart 1, 2 & 3 (Delaney, S. forthcoming (a)). The burnt mound excavated at Site 102, Littlemill 2 dated to the medieval period (890-1250AD). A further 6 burnt mounds/*fulachta fiadh* were excavated by Archaeological Development Services Ltd (ADS Ltd.) as part of the archaeological resolution of the Dunleer/Dundalk Motorway.

The main feature on Site 111A was the oven (**C18**) in subgroup {1006}. These ovens are typically constructed in the fields and built in work hollows. One interpretation could be that the base of the work hollow (which had been subsequently truncated) was used for the cutting of two fairly large but shallow pits in subgroup {1004}. Associated with this were four stakeholes in subgroup {1005} that appear to have supported some form of structure. It is possible that the stakeholes supported some form of scaffolding to help erect the oven roof that would have been built over base in subgroup {1006}. The function of pits in subgroup {1004} is not known. The oven/kiln (**C18**) in subgroup {1006} was stratigraphically the latest feature on site. Although no datable material was retrieved from the earlier features, it is probable that they were directly associated with the oven/kiln.

Charcoal samples were taken from the hearth (**C18**) in subgroup {1006} and were identified as ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) (Appendix 2.1). The charcoal returned a date of 3320+/-41BP (WK – 18557) (Appendix 2.2). The 2 Sigma calibrated results from this sample produced a date of Cal 1700 – 1500BC. The site was originally interpreted as a medieval to post-

medieval malting or 'corn drying' or lime slaking oven but the radiocarbon date obtained from the charcoal samples clearly indicate that this feature dates to the Middle Bronze Age period.

According to O Carroll (Appendix 2.1) the charcoal material identified above probably represents kindling/firewood collected for use within the kiln and hearth. It is clear from the analysis above that a number of species were being used as fuel in the hearth. The wood also appears to have been selected from timbers, which may have lain on the ground for some period of time as the charcoal samples were infested with insect holes. Similar analysis completed from excavated corn drying kilns elsewhere in Ireland have shown that a variety of species are normally present in their remains with oak, ash or hazel dominating the assemblages. Oak is mainly associated with kilns used for metal working activities although it has also been linked with a corn drying kiln as seen at Richardstown, Co. Dublin (02E0128). Corn drying kilns analysed from Morett, 03E0636, Kilgobbin (03E0306), Drumverragh (03E0271 and Lorrha (01E1055) have all produced a variety of species in the analysed assemblages although hazel and ash appear to dominate the results. The type and range of species from the assemblage analysed at Newtownbalregan 1.1 is reflected in other assemblages analysed in Ireland.

According to Eiméar Nelis (Appendix 2.3) the small assemblage of flint recovered from Newtonbalregan 1.1 is mainly populated by unworked material, and includes few artefacts which are the result of primary knapping processes, or secondary tool production, none of which were related. Consequently, it seems that very limited chipped stone technology was undertaken in the vicinity of the site, either during the prehistoric or historic periods. A small number of bipolar and platform flake debitage, and informal core, point to some limited flint reduction in the area, probably during the prehistoric period, spanning the Neolithic and Bronze Age periods; the presence of a thumbnail scraper points to activity specifically relating to the Final Neolithic/Early Bronze Age periods (Nelis 2003). Such limited activity, however, could merely be a single incidence of casual discard or loss across the landscape; similarly, the presence of a single gunflint also points to a single incidence of casual discard or loss, in this case during the Early Modern period, and it too appears unrelated to the remaining debitage assemblage. The gunflint itself does not appear to have been used for its purpose, and may have been a curated blank intended for use at a later stage; in the meantime, however, it is interesting to note that it may have served as a simple cutting tool, as needed, suggested by minimal edge damage along its sharp edge. Little further can be said on the dating of this piece, since little work has been done on the typology and dating of gunflint in an Irish context, however, it is similar to French platform or prismatic types found after the late 18th century (de Lotbiniere 1984).

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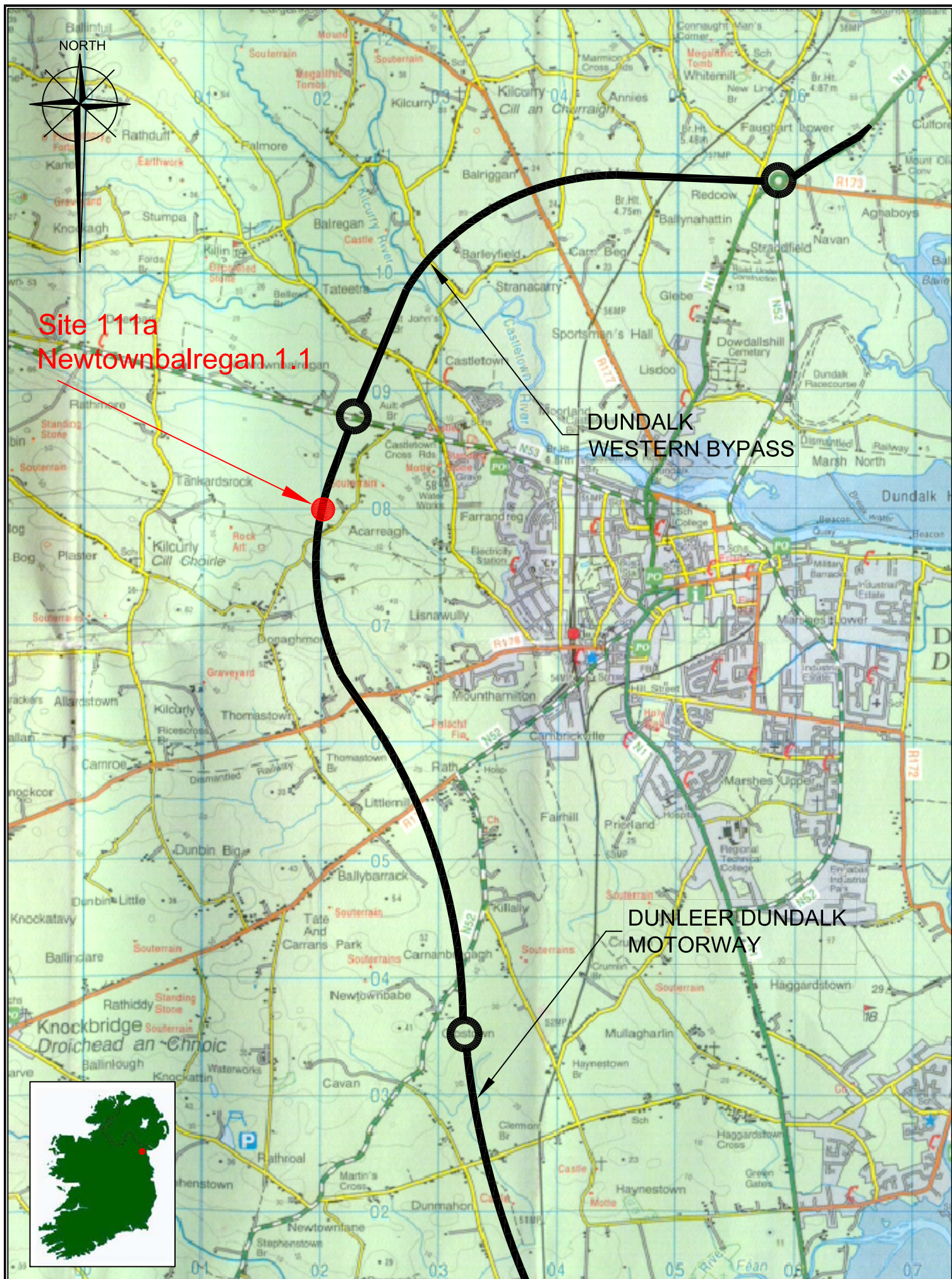
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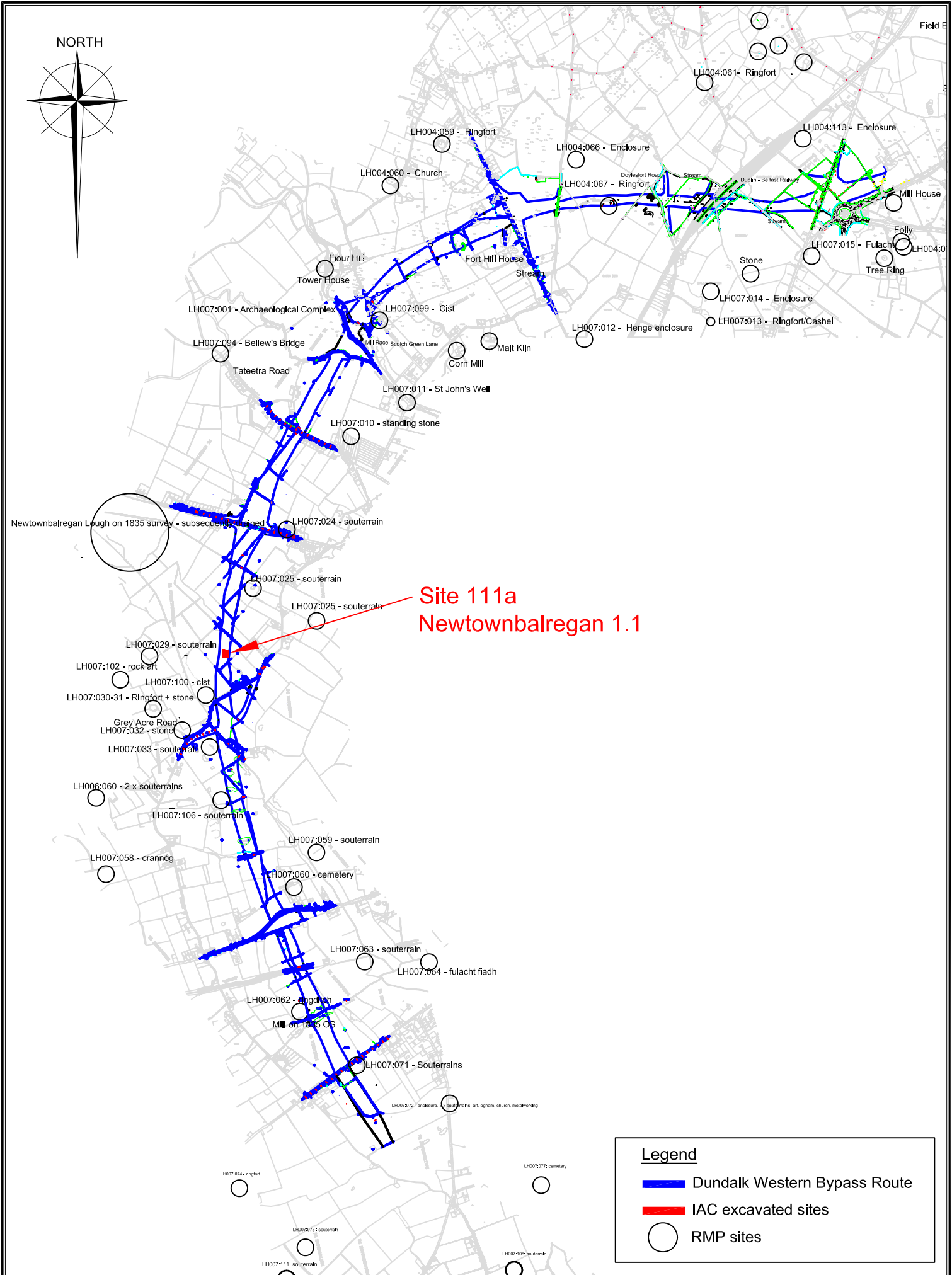
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Project: M1 Dundalk Western Bypass
Client: Louth County Council

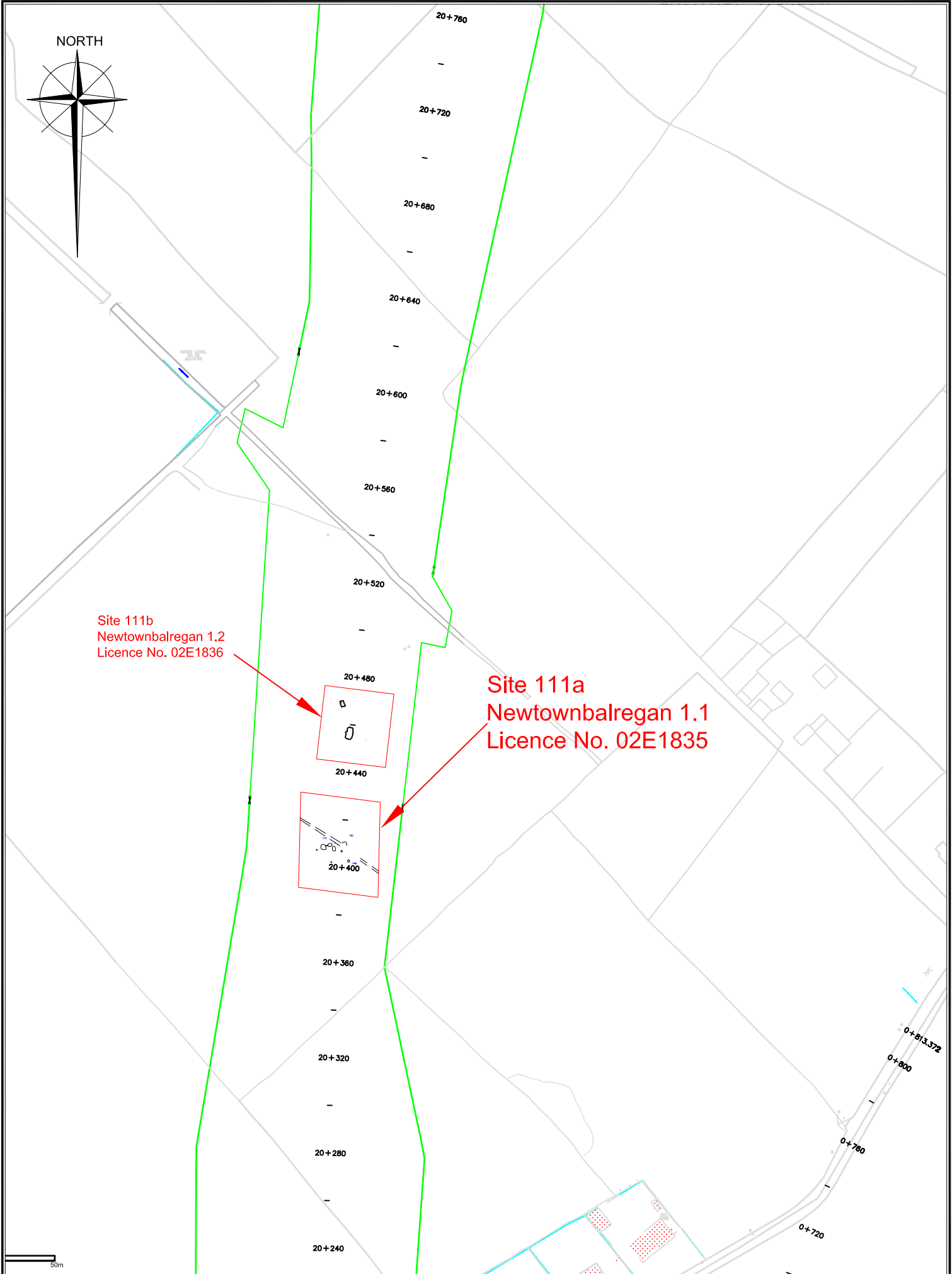
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Produced by: P Higgins
Job No: J2041
Figure No: 1



Irish
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Consultancy Ltd.

Title: Site location with RMP sites shown
Project: M1 Dundalk Western Bypass
Client: Louth County Council

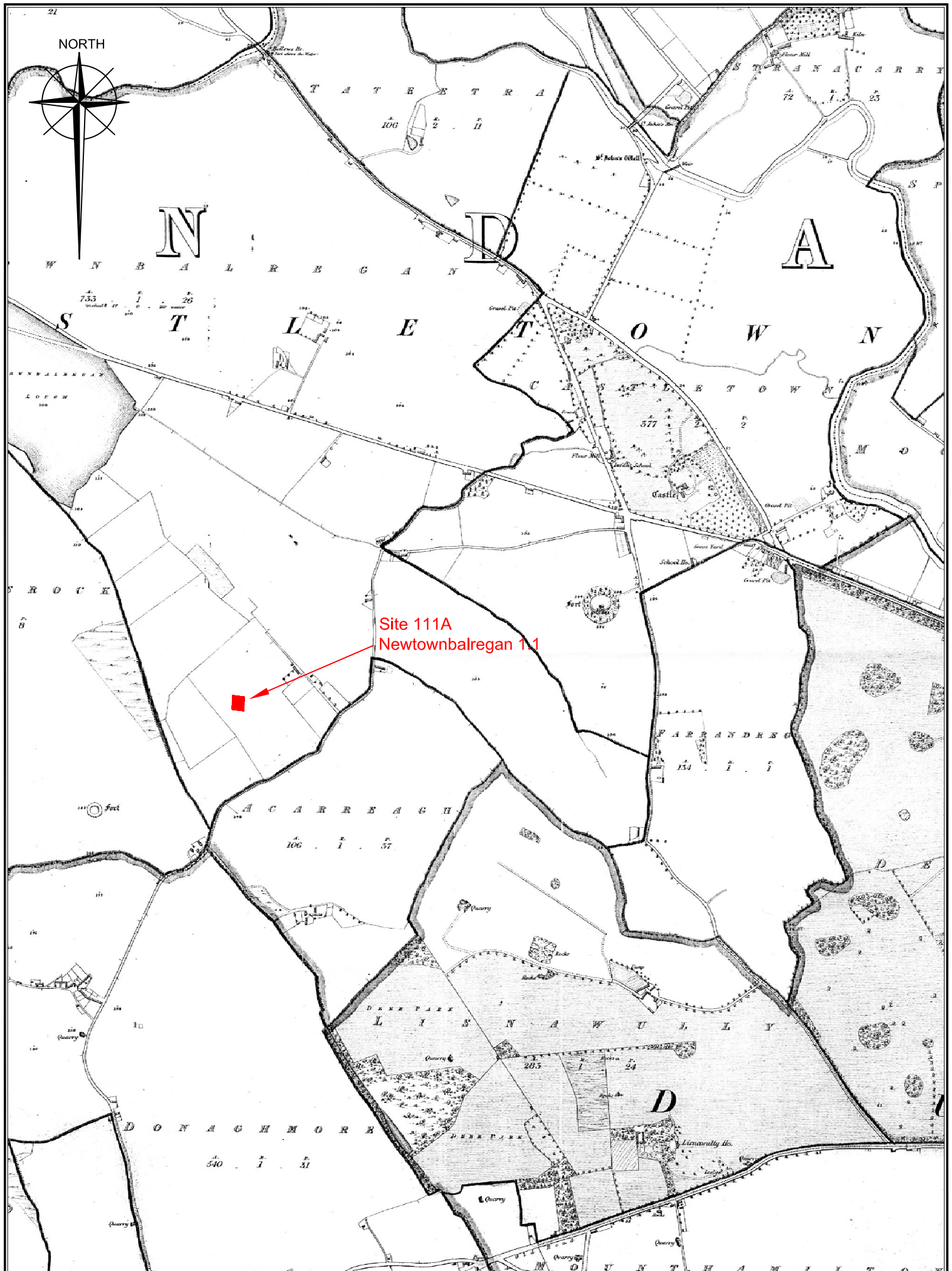
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Produced by: P Higgins
Job No: J2041
Figure No: 2



Irish
Archaeological
Consultancy Ltd.

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Project:	M1 Dundalk Western Bypass
Client:	Louth County Council

Scale:	1:2000
Date:	19/11/07
Produced by:	P Higgins
Job No:	J2041
Figure No:	3



Site 111A
Newtownbalrigan 1.1



Irish
Archaeological
Consultancy Ltd.

Title: 1st Edition OS map

Project: M1 Dundalk Western Bypass

Client: Louth County Council

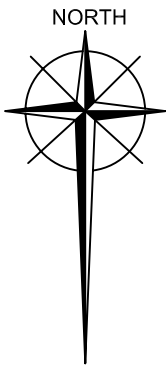
Scale: N. T. S.

Date: 19/11/06

Produced by: P Higgins

Job No: J2041

Figure No: 4



301935E
308010N
+

301955E
308010N
+

C16

Modern drainage ditch

C16

C6

C10

C25

C12

C14

C3

C33

C34

C7

C31

C18

C17

C28

C29

C5

B +

A +

D +

34.02

33.71

34.34

33.84

34.25

34.35

33.98

34.34

301955E
307993N
+

Legend:

- Site Extent
- CPO Line
- Limit of Archaeology
- C## Cut no's
- C## Fill no's



Irish
Archaeological
Consultancy Ltd.

Title: Site 111A, Newtownbalregan 1.1 - post- ex plan

Project: M1 Dundalk Western Bypass

Client: Louth County Council

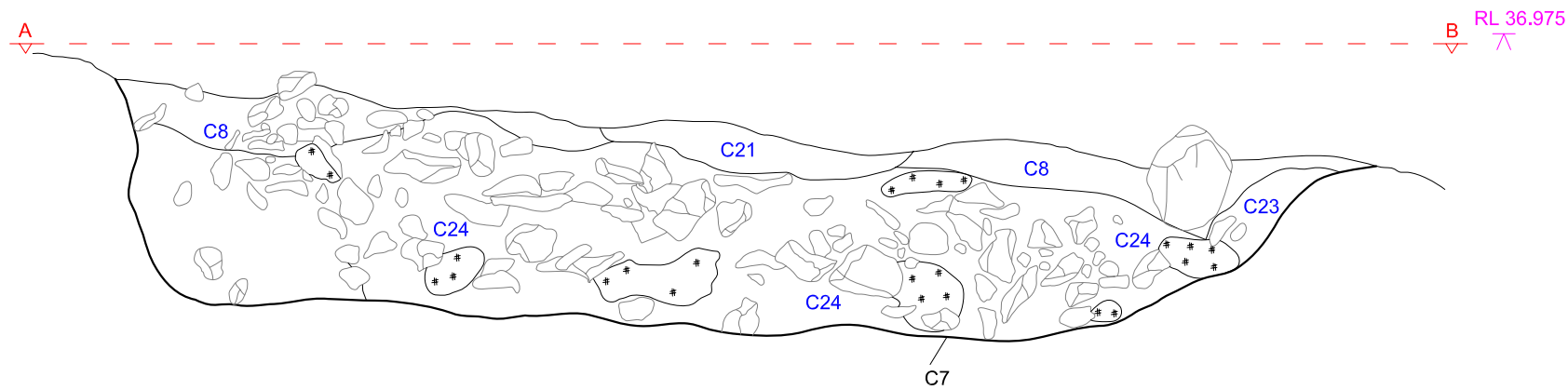
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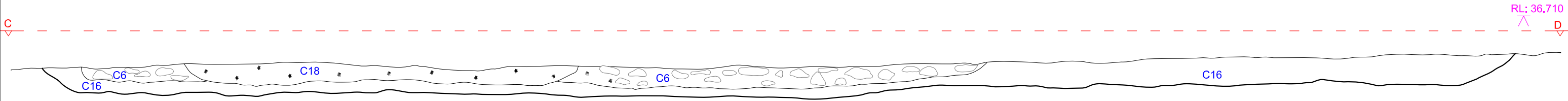
Figure No: 5



Legend	
C##	Fill numbers
C##	Cut number
	Stone
#	Charcoal

 Irish Archaeological Consultancy Ltd.	Title: North Facing Section of hearth C7	Scale: 1:20
	Project: M1 Dundalk Western Bypass	Date: 19/11/07
	Client: Louth County Council	Produced by: P Higgins
		Job No: J2041
		Figure No: 6

Site 111a Newtownbalregan 1.1
South facing section through C6, C16 and C18



Legend

- C## Fill numbers
- C## Cut number
- Stone
- Charcoal



Irish
Archaeological
Consultancy Ltd.

Title: South Facing Section of kiln area {1006}

Project: M1 Dundalk Western Bypass

Client: Louth County Council

Scale: 1:20

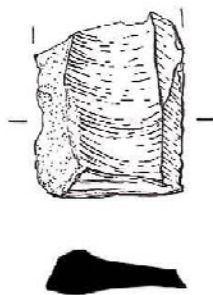
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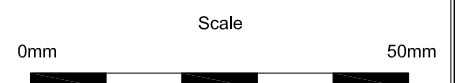
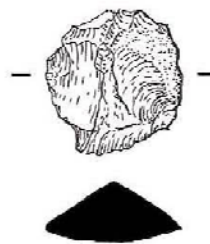
Job No: J2041

Figure No: 7

02E1835:1:1



02E1835:1:2



**Irish
Archaeological
Consultancy Ltd.**

Title:	Site 111a, Newtownbalregan 1.1 - Illustration of 02E1835:1:1 and 02E1835:1:2
Project:	M1 Dundalk Western Bypass
Client:	Louth County Council

Scale:	1:1 @ A4
Date:	30/07/09
Produced by:	G Kearney
Job No:	J2041
Figure No:	8

PLATES



Plate 1: Overhead view of site 111A (on left), facing west (Studiolab)



Plate 2: Site 111A, showing pit [C7] and surface [C6], facing east



Plate 3: Section of [C7], facing north



Plate 4: Post-ex of [C7], facing NE



Plate 5: Section of [C10], facing south



Plate 6: Pre-ex of [C28], facing east



Plate7: Post-ex of [C29], facing north



Plate 8: Post-ex of [C31], facing north

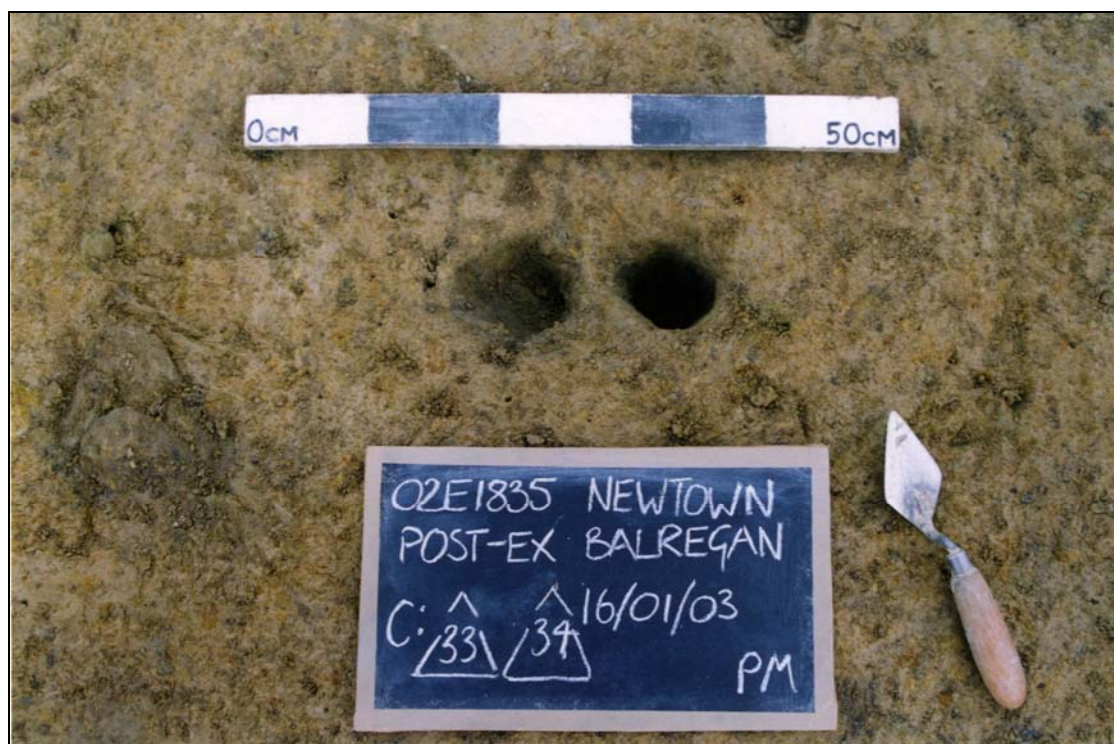


Plate 9: Post-ex of [C33] and [C34], facing north

APPENDIX 1: CATALOGUE OF PRIMARY DATA

Context Index:

C	Area	Fill of	Filled by	Interpretation	Description
1	Site	n/a	n/a	Topsoil	Mid brown sandy clay, mod firm, freq s, m, lg mixed, mod ch fls & frags
2	Site	n/a	n/a	Natural	Brown orange sandy, silty clay
3	0/0	n/a	n/a	Poss kiln or fire 'rake-out'	Charcoal + lt brown clay, 3.5l x 1.2w x 0.04d
4				Non Archaeological	
5	0/0	n/a	C9	Channel	Linear in plan, shallow U-shaped prof, 0.05d x 1.17l x 0.22w, SW-NE
6	10/0	n/a	n/a	Poss floor surface	Stones, avg 0.10 x 0.07 x 0.03 in a matrix of ch-rich grey brown silty clay. 4.8l x 2.3w x 0.12d
7	10/0	n/a	C8, C20, C21, C22, C23, C24	Poss cooking pit	oval in plan, undercut on N+W sides flat base, 0.43d x 1.93l x 1.29w, NE-SW
8	10/0	C7	n/a	Natural silting	Lt brown, loose clayey silt, occ m
9	0/0	C5	n/a	Nat silting	Clay- poss redeposited natural, freq ch fl
10	10/0	n/a	C11, C19	Cut	Sub-circular in plan, gently sloping sides, concave base, 0.10d x 0.60l x 0.49w
11	10/0	C10	n/a	Deliberate fill	Med brown, silty clay, ch fl, occ s ang+sub-ang, some showing effects of heating
12				Non Archaeological	-
13				Non Archaeological	-
14	0/0	n/a	C15	Cut	Oval in plan, mod steep sides irreg concave base, 0.18d x 0.48l x 0.26w
15	0/0	C14	n/a	Nat silting	Med brown, silty sand +redeposited nat, occ ch fl, rare s sub-ang
16	10/0	n/a	n/a	Poss underlay to c.6	Irreg in plan, lt orange grey, silty clay, mod ch fl+ occ ch frag. 8.2l x 5.25w x 0.12d
17	10/0	n/a	n/a	Redeposited natural	Circular in plan lt orange brown, silty clay, mod ch fl, mod s sub-ang. 1l x 0.5w x 0.1d
18	10/0	n/a	n/a	Poss hearth	Oval in plan, mod compact tblack ch-rich silty clay, freq m sub-ang+mod sub-ang. 2l x 1.3w x 0.1d.
19	10/0	C10	n/a	Fill	Grey clay, occ ch fl, freq m+s sub-ang, heat-affected sandstone
20				Same as C24	-
21	10/0	C7	n/a	Fill	Very dk brown/black, loose clay
22				Same as C24	-
23	10/0	C7	n/a	burnt later	Intermittent, thin layer of charcoal just above natural
24	10/0	C7	n/a	fill	Dark brown, loose clay, with freq stone inclusions
25	10/10	n/a	C26, C27	Poss pit	Circular in plan, mod steep sides, flat base generally, 0.20d x 0.98l x 0.92w
26	10/10	C25	n/a	Nat silting	Med brown, silty sand, ch fl, rare s sub-ang.
27	10/10	C25	n/a	Fill	Grey clay, ch fl, mod m-l ang+sandstone flecks, similar colour+texture to c16
28	10/0	n/a	C44, C45	Pit	Oval in plan, U-shaped prof,

					concave base, 0.20d x 1.70l x 1.30w N-S
29	20/10	n/a	C30	Posthole	Circular in plan, near-vertical sides, uneven blunt, tapered base, 0.12d x 0.09l x 0.09w
30	20/10	C29	n/a	Poss post + packing stones	Grey blackmod loose silty clay, freq ch, mod s sub-ang, med-l stones at base + side
31	20/10	n/a	C32	posthole	Circular in plan, U-shaped prof, base concave, 0.10d x 0.10l x 0.10w
32	20/10	C31	n/a	Poss burnt post	Grey black, mod loose silty clay, freq ch, mod s sub-ang
33	20/10	n/a	C35	Posthole	Circular in plan, steep sides, base concave, 0.07d x 0.07l x 0.07w
34	20/10	n/a	C36	Posthole	Circular in plan, vertical sides, flat base, 0.17d x 0.08l x 0.08w
35	20/10	C33	n/a	Poss burnt post + packing stone	Grey black, mod loose silty clay, freq ch, mod s sub-ang, larger stone on side
36	20/10	C34	n/a	Poss burnt post	Grey black, mod loose silty clay, freq ch, mod s sub-ang
37				Non Archaeological	-
38				Non Archaeological	-
39				Non Archaeological	-
40				Non Archaeological	-
41	10/10	n/a	n/a	Spread w/ poss burning	Irreg in plan, blue brown grey, soft silty clay, freq ch, rare s-med ang. 2.25l x 0.9w x 0.03d
42				Non Archaeological	-
43				Non Archaeological	-
44	10/0	C28	n/a	Fill	Mid brown grey, loose clayey silt, very freq s+med sub-ang, occ l sub-ang, occ ch
45	10/0	C28	n/a	burnt spread	Ch, occ med flat sub-ang
46	Site	n/a	C47	Land drain	U-shaped profile 0.3d x 0.6w
47	Site	C46	n/a	Natural silting	Lt brown silty clay. Occ ch incl

Finds Index:

Context	Find	Artifact type	Description
1	02E1835:1:1	Modified	Flint
1	02E1835:1:2	Modified	Flint
1	02E1835:1:3	Unworked	Flint
1	02E1835:1:4	Unworked	Flint
1	02E1835:1:5	Unworked	Flint
1	02E1835:1:6	Unworked	Flint
1	02E1835:1:7	Unworked	Flint
1	02E1835:1:8	Unworked	Flint
1	02E1835:1:9	Unworked	Flint
1	02E1835:1:10	Core	Flint
1	02E1835:1:11	Unworked	Flint
1	02E1835:1:12	Unworked	Flint
1	02E1835:1:13	Angular shatter	Flint
1	02E1835:1:14	Unworked	Flint
1	02E1835:1:15	Unworked	Flint
1	02E1835:1:16	Unworked	Flint
1	02E1835:1:17	Unworked	Flint
1	02E1835:1:18	Unworked	Flint
1	02E1835:1:19	Unworked	Flint
1	02E1835:1:20	Unworked	Flint
1	02E1835:1:21	Unworked	Flint
1	02E1835:1:22	Unworked	Flint
1	02E1835:1:23	Flake	Flint
1	02E1835:1:24	Flake	Flint

1	02E1835:1:25	Angular shatter	Flint
1	02E1835:1:26	Flake	Flint
1	02E1835:1:27	Flake	Flint
1	02E1835:1:28	Unworked	Flint
1	02E1835:1:29	Angular shatter	Flint
1	02E1835:1:30	Unworked	Flint
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16	02E1835:16:4	Unworked	Flint
16	02E1835:16:5	Unworked	Flint
16	02E1835:16:6	Unworked	Flint
16	02E1835:16:7	Unworked	Flint
16	02E1835:16:8	Unworked	Flint
16	02E1835:16:9	Unworked	Flint
18	02E1835:18:1	Unworked	Flint
27	02E1835:27:1	Unworked	Flint
27	02E1835:27:2	Unworked	Flint
41	02E1835:41:1	Unworked	Flint
41	02E1835:41:2	Unworked	Flint
44	02E1835:44:1	Unworked	Flint

APPENDIX 2: SPECIALISTS REPORTS

APPENDIX 2.1: SPECIES IDENTIFICATION OF CHARCOAL SAMPLES

SPECIES IDENTIFICATION OF CHARCOAL SAMPLES FROM NEWTOWNBALREGAN 1.1 (02E01855), COUNTY LOUTH

ELLEN OCARROLL

February 2006

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1. INTRODUCTION

Three charcoal samples were submitted for analysis from Newtownbalregan 1.1, Dundalk by-pass. Newtownbalregan 1.1 was located 1 km west of Dundalk town. The main feature on the site was a large oven/kiln dated to the middle Bronze Age (1700-1500BC). These ovens are typically made in the fields, built in work hollows. The base of the (truncated) construction cut was lined with clay and over this the stone packed base of the oven/kiln was constructed (it survived at 4.8m x 2.3m in plan, the actual floor perhaps originally around 5m x 2.5m).

The hearths and pits were possibly related to the heating of the charcoal/wood and the deposition of material associated with the industrial activity/ovens and kilns at the site. The samples received for analysis from the above excavations was retrieved from two hearths (C18) and (C24) and a pit (C45) related to industrial activity at the site.

The charcoal was sent for species identification prior to ¹⁴C dating and also to give an indication of the range of tree species, which grew, in the vicinity. Charcoal and wood analyses may also provide information on the utilization of certain species for various functions. Wood used for fuel at pre-historic sites would generally have been grown at locations close to the site. Therefore species identifications may, but do not necessarily, reflect the composition of the local woodlands.

2. METHODS

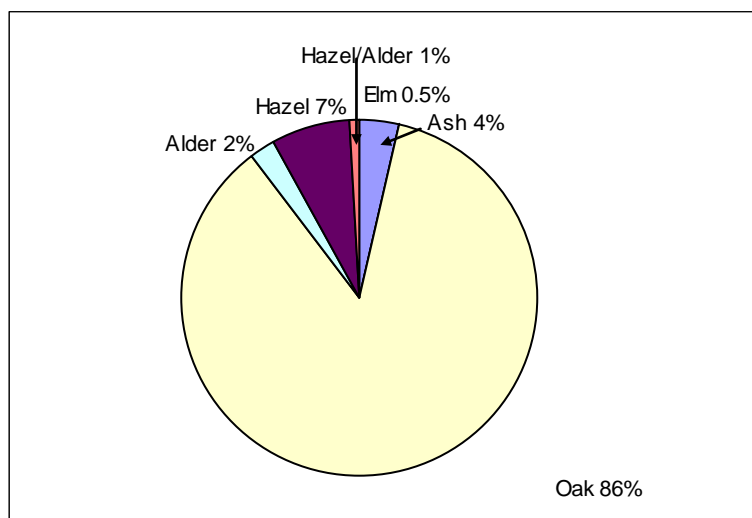
The process for identifying wood, whether it is charred, dried or waterlogged is carried out by comparing the anatomical structure of wood samples with known comparative material or keys (Schweingruber 1990). The identification of charcoal material involves breaking the charcoal piece so that a clean section of the wood can be obtained. This charcoal is then identified to species under a Nikon SM800 zoom stereomicroscope and a Nikon Y100 compound microscope. By close examination of the microanatomical features of the samples the species are determined. The diagnostic features used for the identification of charcoal are micro-structural characteristics such as the vessels and their arrangement, the size and arrangement of rays, vessel pit arrangement and also the type of perforation plates.

3. QUANTIFICATION/RESULTS

Table 1: Results from charcoal identifications

Site no.	Context No and type	Sample No	Identification	Weight and comment
Newtownbalregan 1.1, 02E1835	C18, Fill of hearth	4	Ash (<i>Fraxinus excelsior</i>), alder (<i>Alnus glutinosa</i>) & hazel (<i>Corylus avellana</i>), elm (<i>Ulmus</i> sp) & oak (<i>Quercus</i> spp)	Insect infested. Ash (4g), hazel (8.4g), Alder (2g), Elm (0.1g), Oak (0.1g)
Newtownbalregan 1.1, 02E1835	C45, fill of pit –industrial area	21	Oak & alder	Oak (98g), alder (0.5g)
Newtownbalregan 1.1, 02E1835	C24, backfill of hearth material- industrial area		Oak & alder/hazel	Tiny charcoal fragments oak (.01g), Hazel/alder (0.8g) was iron stained and difficult to differentiate

Figure 1: Taxa type present in the assemblage



4. PROVENANCE

The samples received for analysis from the excavations at Newtownbalregan 1.1 were retrieved from two hearths (**C18 & C24**) and a pit (**C45**). The pit **C45** and the hearth **C24** may be related to industrial activity at the site while the second hearth was associated with the remains of a metalled surface (**C6**) 4.8m x 2.3m x 0.12m deep, mostly consisting of greywacke stone, with a centrally located hearth (**C18**) 2m x 1.3m x 0.1m deep.

Ash, hazel, elm oak and alder charcoal were identified from the assemblage. The charcoal is most likely to represent fuel used at the site in association with the metalworking activities and the oven/kiln.

Ash (*Fraxinus excelsior*), which was identified from the fill of the hearth (**C18**), is a native species preferring lime-rich freely draining soils. It is not a very durable timber in waterlogged conditions but has a strong elastic nature. It is easily worked and lends itself well to a range of different requirements like the turning of wooden bowls.

Alder was identified from all contexts analysed. Alder (*Alnus glutinosa*) is a widespread native tree and occurs in wet habitats along streams and riverbanks. Alder also grows frequently on fen peat. It is an easily worked and split timber and does not tear when worked. Alder is commonly identified from wood remains associated with wet/boggy areas.

English elm (*Ulmus procera*) and wych elm (*Ulmus glabra*) cannot be separated by their wood structure. A small amount of elm was identified from the hearth (**C18**). As suggested by Mitchell (1986) elm declined (although would not have completely died out) with the advent of farming and possibly dutch elm disease around 3700BC. It generally prefers damp woods particularly on limestone.

Hazel (*Corylus avellana*), was identified from (**C18 & C24**), and was very common up to the end of the 17th century. It was used for the manufacture of many wooden structures such as wattle walls, posts, trackways and baskets. McCracken (1971, 19) points out that "it was once widespread to a degree that is hard to imagine today". With the introduction of brick, steel and slate the crafts associated with

hazel became obsolete, and today the woods that supplied hazel have diminished rapidly. Hazel is normally only about 3-5m in height and is often found as an understory tree in deciduous woods dominated by oak. It also occurs as pure copses on shallow soils over limestone as in The Burren in Co. Clare and survives for 30 to 50 years. Its main advantage is seen in the production of long flexible straight rods through the process known as coppicing.

Large quantities of oak were identified from (C45) and smaller amounts were identified from (C18 & C24). Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*) are both native and common in Ireland and the wood of these species can not be differentiated on the basis of their anatomic characteristics. Pedunculate oak is found growing in areas of heavy clays and loams, particularly where the soil is alkaline. Sessile oak is found on acid soils and often in pure stands. Unlike pedunculate oak, it thrives on well-drained soils but is tolerant of flooding (Beckett 1979, 40-41). Both species of oak grow to be very large trees (30-40m high).

Oak was one of the most prevalent trees growing in Ireland throughout the medieval period. The anglicised form of the Irish name for oak (derry) is included in many townland names today. Out of 62,000 townlands in Ireland about 1,600 contain the word "derry" in one form or another, either as a prefix or suffix (Mc Cracken 1971, 23).

Oak is a dense wood and is very suitable for charcoal production. It also makes good firewood when dried and will grow in wetland areas when conditions are dry. Charcoal was important in prehistoric and medieval Ireland as it burned hotter and cleaner than wood and was considered superior to wood in that respect. We know from historical sources that the charcoal maker, or collier, was an important figure in early medieval Ireland. Oak also has unique properties of great durability and strength and was frequently used in the manufacture of posts and wooden planks.

5. CONSERVATION

The sample presented for analysis is suitable for conventional ¹⁴C dating. The desired amount of charcoal for a conventional ¹⁴C date is 5 grams.

6. COMPARATIVE MATERIAL

Wood was a vital and widely used raw material from prehistoric to medieval times although its importance is rarely reflected in the analysis of archaeological assemblages mainly due to its perishable nature. It is important to note that people in prehistoric, Early Christian and medieval communities were mainly dependant on woodland resources for the construction of buildings and for the manufacture of most implements. The woods in a surrounding catchment area were exploited and often managed to provide an essential raw material for the community. The economic importance of wood cannot be overestimated.

A study of the range of species on an archaeological site offers an indication of the composition of a local woodland in its period of use. When some trees are felled the stool left in the ground will produce several new stems, which will grow rapidly. This type of management is known as coppicing. In many woodland areas a number of species of wood are suitable for the production of crops of long narrow stems used for fences, brushwood, hurdle trackways and wattle walls.

From the preliminary studies mentioned above it is clear that oak was the most common species used for wall-posts and planks, hazel was preferred for wattle

structures and species such as ash, willow, alder, birch and holly were utilised for a variety of other structural requirements. The work carried out on species selection suggests that availability around a given catchment area was probably the main factor, which influenced choice of timber.

As the pit remains undiagnostic and the function of it is unknown it is difficult to make comparisons with other excavated sites. Pits which produce mainly oak charcoal may be classified as charcoal production pits and pits which produce ash and hazel charcoal suggest that the pit may have been surrounded by a wattle structure.

The charcoal material identified above probably represents kindling/firewood collected for use within the oven and hearths. It is clear from the analysis above that a number of species were being used as fuel in the hearth particularly in **(C18)**. The wood from **(C18)** also appears to have been selected from timbers, which may have lain on the ground for some period of time as the charcoal samples were infested with insect holes.

In contrast to **C18** over 99% of the identified charcoal from the pit **C45** was oak. This suggests that this pit may indeed be associated with charcoal production or an industrial activity as oak is the preferred taxa for such activities.

Tiny fragments of iron stained alder/hazel and oak were also identified from the hearth **(C24)** which is possibly representative of fuel used at the site.

The type and range of species from the assemblage analysed at Newtownblaregan 1.1 is reflected in other assemblages analysed in Ireland. Similar analysis completed from excavated hearths elsewhere in Ireland has shown that a variety of species are normally present in their remains. Oak is mainly associated with features used for metal working or industrial activities.

7. DISCUSSION AND SUMMARY

The range of species identified from the Newtownblaregan 1.1 excavations includes large (ash, elm & oak) and smaller (hazel & alder) trees. The hazel, alder, ash elm and oak identified from the oven/hearth material **(C18)** showed some insect channels and some of the charcoal was of a knotty nature. This is suggestive of material being collected from wood branches, which had been lying on the ground for some time. It is difficult to say much about the hearth **(C24)** where only minute amounts of alder/hazel and oak were identified from. The charcoal may be associated with firewood for some type of industrial activity.

The large quantities of oak identified from the industrial type pit **(C45)** is in contrast to the charcoal taxa identified from the hearths **(C18 and C24)**. This indicates that the hearth features and the pit may have performed different functions. The predominance of oak identified from **(C45)** is indicative of industrial or charcoal making activities.

Recent excavations along the many road schemes have produced a large quantity of pits containing oak charcoal. These pits functioned as charcoal production pits or pits for the burning of fuel for industrial activities. The oak was probably specifically collected for use in the pit **C45** due to its properties as a good firewood and charcoal producer that can reach high temperatures when burned.

Ash, elm, oak and hazel trees will grow in free draining dry soils while alder is generally associated with a wetland environment beside a river or stream.

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APPENDIX 2.2 RADIO CARBON DATING REPORT

The University of Waikato Radiocarbon Dating Laboratory

One C 14 date was established for the site at Newtownbalregan 1.1

The un-calibrated result is as follows:

Wk18557 Newtownbalregan 1.1; 02E1835: **(C18)**, hazel (*Corylus avellana*), alder (*Alnus glutinosa*) ash (*Fraxinus excelsior*) (1.2g)

d 14 C	-340.7+/-3.3
d 13 C	-26.6+/-0.2
D 14 C	-338.6+/-3.4
% modern	66.1+/-0.3
Result	3320+/-41 BP

The calibrated results were processed using the Intcal 04 calibration curve. The result (95.4% probability) was as follows:

Wk18557 Newtownbalregan 1.1; 02E1835: **(C18)**, hazel (*Corylus avellana*), alder (*Alnus glutinosa*) ash (*Fraxinus excelsior*) (1.2g)

Cal BC 1700-1500BC (95.4% probability)

Intcal 04 reference: Reimer, P. J., Baillie, M. G. L., Bard, E., Bayliss, A., Beck, J. W., Bertrand, C. J. H., Blackwell, P. G., Buck, C. E., Burr, G. S., Cutler, K. B., Damon, P.E., Edwards, R. L., Fairbanks, R. G., Friedrich, M., Guilderson, T. P., Hogg, A. G., Hughen, K. A., Kromer, B., McCormac, G., Manning, S., Bronk Ramsey, C., Reimer, R. W., Remmele, S., Southon, J. R., Stuiver, M., Talamo, S., Taylor, F. W., van der Plicht, J., Weyhenmeyer, C. E., IntCal04 Terrestrial Radiocarbon Age Calibration, 0 - 26 ka cal BP, *Radiocarbon* 46 (nr 3, 2004).

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Report on Radiocarbon Age Determination for Wk-

18557

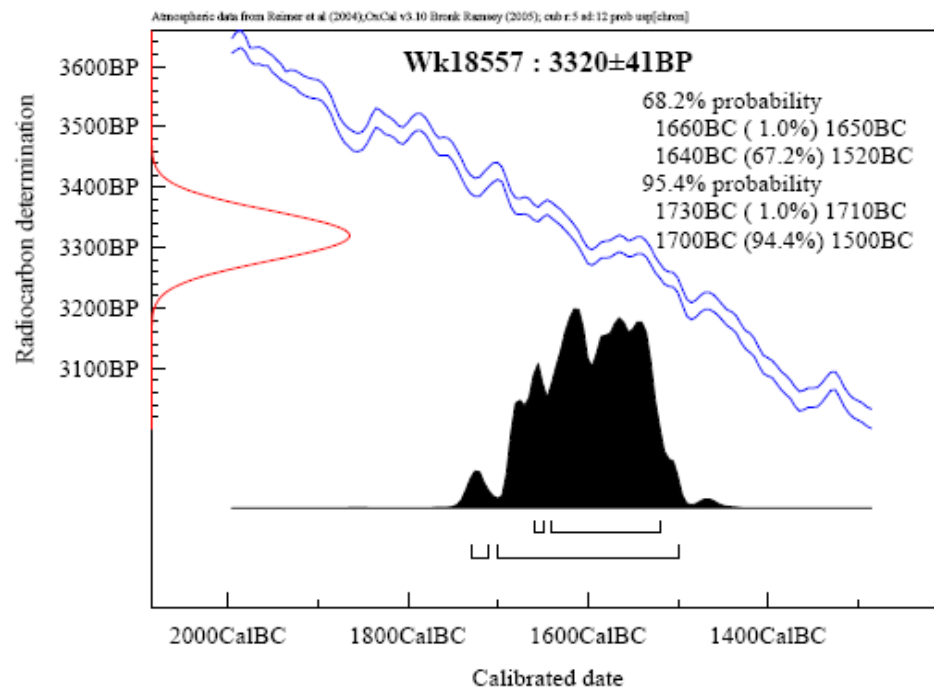
Submitter	Ii Johnston
Submitter's Code	Newtownbalregan 1.1/18/4
Site & Location	Dundalk Western Bypass, Ireland
Sample Material	<i>Alnus glutinosa</i> , <i>Fraxinus excelsior</i> , <i>Corylus avellana</i>
Physical Pretreatment	Possible contaminants were removed. Washed in ultrasonic bath.
Chemical Pretreatment	Sample washed in hot 10% HCl, rinsed and treated with hot 0.5% NaOH. The NaOH insoluble fraction was treated with hot 10% HCl, filtered, rinsed and dried.

$\delta^{14}\text{C}$	-340.7 ± 3.3	‰
$\delta^{13}\text{C}$	-26.6 ± 0.2	‰
D^{14}C	-338.6 ± 3.4	‰
% Modern	66.1 ± 0.3	‰
Result	3320 ± 41 BP	

Comments


3/5/06

- Result is *Conventional Age* or % Modern as per Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier of 1.
- The isotopic fractionation, $\delta^{13}\text{C}$, is expressed as ‰ wrt PDB.
- Results are reported as % Modern when the conventional age is younger than 200 yr BP.



APPENDIX 2.3: LITHICS REPORT

CHIPPED STONE AND WORKED STONE ASSEMBLAGE ANALYSIS REPORTS AND CATALOGUES FOR NEWTONBALREGAN 1.1 (02E1835)

**DR EIMÉAR NELIS
MA PHD MIAI**

CHIPPED FLINT AND NON-FLINT ASSEMBLAGE

Introduction

Excavations at Site 111A, Newtonbalregan 1.1 (02E1835: Bayley 2004b), revealed the possible remains of a Middle Bronze Age kiln and associated features. From these was recovered an assemblage of flint artefacts (76 pieces) (Table 1).

Unique No	Basic Character	Classification	Condition	Cortex	Fragment (mm)	Length (mm)	Breadth (mm)	Thickness (mm)	Mass (g)
02E1835:1:1	Modified	Possible gunflint: unused	Fresh	Secondary	22	22	18	6	2.98
02E1835:1:2	Modified	Scraper	Fresh	Tertiary	-	17	18	6	2.29
02E1835:1:3	Unworked	Abraded lump	Abraded	Secondary	-	35	30	26	31.28
02E1835:1:4	Unworked	Abraded lump	Abraded	Secondary	-	50	42	29	63.70
02E1835:1:5	Unworked	Abraded lump	Abraded	Secondary	-	52	44	34	81.28
02E1835:1:6	Unworked	Abraded lump	Abraded	Secondary	-	51	38	22	42.06
02E1835:1:7	Unworked	Abraded lump	Abraded	Secondary	-	35	31	17	27.40
02E1835:1:8	Unworked	Thermal flake	Abraded	Tertiary	-	25	15	7	2.68
02E1835:1:9	Unworked	Thermal lump	Abraded	Secondary	-	40	29	18	19.02
02E1835:1:10	Core	Flaked chunk	Abraded	Primary	-	31	35	24	26.44
02E1835:1:11	Unworked	Thermal flake	Abraded	Tertiary	-	30	13	5	1.89
02E1835:1:12	Unworked	Abraded lump	Abraded	Secondary	-	28	25	16	14.61
02E1835:1:13	Angular shatter	Knapping debitage	Fresh	Secondary	-	25	17	12	6.93
02E1835:1:14	Unworked	Abraded lump	Abraded	Secondary	-	26	18	17	8.18
02E1835:1:15	Unworked	Abraded lump	Abraded	Secondary	-	28	22	19	16.01
02E1835:1:16	Unworked	Thermal lump	Abraded	Secondary	-	28	25	14	12.71
02E1835:1:17	Unworked	Thermal lump	Abraded	Tertiary	-	30	13	12	7.19
02E1835:1:18	Unworked	Abraded lump	Abraded	Primary	-	26	20	14	10.48
02E1835:1:19	Unworked	Thermal lump	Abraded	Secondary	-	25	15	10	4.63
02E1835:1:20	Unworked	Thermal flake	Abraded	Secondary	-	25	25	12	10.40
02E1835:1:21	Unworked	Thermal lump	Abraded	Secondary	-	20	22	10	6.87
02E1835:1:22	Unworked	Abraded lump	Abraded	Secondary	-	40	42	22	46.28
02E1835:1:23	Flake	Bipolar complete	Abraded	Secondary	-	31	16	11	4.60
02E1835:1:24	Flake	Platform: core trimming	Abraded	Secondary	-	13	25	7	1.86
02E1835:1:25	Angular shatter	Knapping debitage	Abraded	Secondary	-	30	15	9	4.32
02E1835:1:26	Flake	Bipolar complete	Abraded	Tertiary	-	21	22	6	4.44
02E1835:1:27	Flake	Platform complete	Abraded	Secondary	-	20	19	6	2.29
02E1835:1:28	Unworked	Thermally split pebble	Abraded	Secondary	-	22	18	10	6.04
02E1835:1:29	Angular shatter	Knapping debitage	Abraded	Secondary	-	28	18	15	7.20
02E1835:1:30	Unworked	Abraded lump	Abraded	Secondary	-	22	18	10	4.48
02E1835:1:31	Unworked	Abraded lump	Abraded	Secondary	-	20	18	12	3.97
02E1835:1:32	Unworked	Abraded lump	Abraded	Secondary	-	20	12	10	3.58
02E1835:1:33	Unworked	Abraded lump	Abraded	Tertiary	-	17	12	8	2.11
02E1835:1:34	Unworked	Abraded lump	Abraded	Tertiary	-	8	6	4	1.44
02E1835:1:35	Unworked	Abraded lump	Abraded	Tertiary	-	16	8	5	1.30
02E1835:1:36	Unworked	Abraded lump	Abraded	Secondary	-	20	19	10	4.51
02E1835:1:37	Unworked	Abraded lump	Abraded	Secondary	-	22	19	13	5.95
02E1835:1:38	Unworked	Abraded lump	Abraded	Secondary	-	25	16	13	4.39
02E1835:1:39	Unworked	Abraded lump	Abraded	Secondary	-	15	16	14	4.05
02E1835:1:40	Unworked	Abraded lump	Abraded	Secondary	-	18	15	8	3.92
02E1835:1:41	Unworked	Abraded lump	Abraded	Secondary	-	20	20	9	3.59
02E1835:1:42	Unworked	Abraded lump	Abraded	Tertiary	-	21	12	6	2.21
02E1835:1:43	Unworked	Abraded lump	Abraded	Secondary	-	16	12	9	3.27
02E1835:1:44	Unworked	Abraded lump	Abraded	Tertiary	-	22	12	7	2.18
02E1835:1:45	Unworked	Abraded lump	Abraded	Secondary	-	17	15	11	3.93
02E1835:1:46	Unworked	Abraded lump	Abraded	Secondary	-	17	15	8	2.30
02E1835:1:47	Unworked	Abraded lump	Abraded	Secondary	-	18	12	8	2.46
02E1835:1:48	Unworked	Abraded lump	Abraded	Secondary	-	14	11	7	1.82
02E1835:1:49	Unworked	Abraded lump	Abraded	Secondary	-	18	14	7	2.08
02E1835:1:50	Unworked	Abraded lump	Abraded	Tertiary	-	12	10	8	1.10
02E1835:1:51	Unworked	Abraded lump	Abraded	Secondary	-	15	10	10	1.75
02E1835:1:52	Unworked	Abraded lump	Abraded	Tertiary	-	17	12	6	1.67
02E1835:1:53	Unworked	Abraded lump	Abraded	Secondary	-	12	10	8	1.81
02E1835:1:54	Unworked	Abraded lump	Abraded	Tertiary	-	15	10	9	1.30
02E1835:1:55	Unworked	Abraded lump	Abraded	Secondary	-	18	14	5	1.85
02E1835:1:56	Unworked	Abraded lump	Abraded	Secondary	-	17	14	6	2.01
02E1835:1:57	Unworked	Thermal lump	Patinated	Secondary	-	18	16	11	4.32
02E1835:1:58	Unworked	Thermal lump	Patinated	Secondary	-	15	13	8	2.27
02E1835:1:59	Unworked	Thermal lump	Patinated	Secondary	-	15	11	5	1.06

02E1835:1:60	Unworked	Thermal lump	Patinated	Secondary	-	11	10	9	1.76
02E1835:1:61	Unworked	Thermal flake	Patinated	Secondary	-	17	15	9	2.35
02E1835:16:1	Flake	Platform complete	Patinated	Primary	-	22	21	3	2.11
02E1835:16:2	Unworked	Thermal flake	Abraded	Primary	-	41	36	21	33.82
02E1835:16:3	Unworked	Abraded lump	Abraded	Primary	-	22	20	13	7.18
02E1835:16:4	Unworked	Abraded lump	Abraded	Secondary	-	23	14	8	3.28
02E1835:16:5	Unworked	Thermal flake	Patinated	Secondary	-	15	16	5	1.26
02E1835:16:6	Unworked	Thermal flake	Abraded	Secondary	-	13	10	6	1.01
02E1835:16:7	Unworked	Abraded lump	Abraded	Secondary	-	12	8	6	1.23
02E1835:16:8	Unworked	Abraded lump	Abraded	Tertiary	-	13	8	6	1.39
02E1835:16:9	Unworked	Thermal lump	Abraded	Tertiary	-	10	8	5	.62
02E1835:18:1	Unworked	Abraded lump	Abraded	Secondary	-	30	20	19	12.79
02E1835:27:1	Unworked	Abraded lump	Abraded	Secondary	-	21	8	8	4.75
02E1835:27:2	Unworked	Thermal flake	Abraded	Secondary	-	28	20	12	8.08
02E1835:41:1	Unworked	Abraded lump	Abraded	Secondary	-	25	16	11	5.23
02E1835:41:2	Unworked	Abraded lump	Abraded	Secondary	-	20	18	12	4.81
02E1835:44:1	Unworked	Thermal flake	Abraded	Secondary	-	21	13	8	2.44

Table 1: Dundalk Western Bypass: Newtownbalregan 1 (02E1835): showing basic composition of the flint assemblage.

The assemblage mainly comprised unworked material (65/76 pieces), with the remainder including a small number of flake debitage (5/76 pieces) and angular shatter (3/76 pieces), as well as a single core and two modified tools.

General provenance of assemblage

The assemblage was recovered from a small number of deposits related to the putative kiln and associated features (Bayley 2004b) (Table 2). Over three quarters of the assemblage was found in topsoil (C1: 61 pieces). Most of the remainder were found in C16 (9 pieces), a debris layer associated with the metallised surface (C6). In addition to these, a small number of artefacts were retrieved from C27, the fill of pit C25 (2 pieces), and C41, a possible burnt spread (2 pieces); single examples of flint artefacts were found in C18, a possible hearth, and C44, the fill of pit C28 (Table 10.2).

Context No	Description	Unworked	Core	Flake Debitage	Angular shatter	Modified	TOTAL
1	Group 3: Subgroup 1008: Topsoil	51	1	4	3	2	61
16	Group 2: Subgroup 1006: Industrial debris	8	-	1	-	-	9
18	Group 2: Subgroup 1006: Possible hearth	1	-	-	-	-	1
27	Group 2: Subgroup 1003: Fill of pit C25	2	-	-	-	-	2
41	Group 2: Subgroup 1006: Possibly burnt spread	2	-	-	-	-	2
44	Group 2: Subgroup 1004: Fill of pit C28	1	-	-	-	-	1
	TOTAL	65	1	5	3	2	76

Table 2: Dundalk Western Bypass Newtownbalregan 1 (02E1835): showing distribution and basic composition of the flint assemblage.

Most of the flint found at Newtownbalregan 1 seemed to have derived from glacial drift, naturally occurring within the local soils. Only one piece seemed to have an alternate source: this was the core (02E1835:1:10) which was based on a beach pebble. The bulk of the assemblage was in an abraded condition (66 pieces), with the remainder being patinated (7 pieces) or in a fresh condition (3 pieces); none of the artefacts found at Newtownbalregan 1 had been subject to burning.

Assemblage summary

The assemblage was mainly comprised of unworked material (65 pieces), which included the majority of material found in topsoil (C1), and all artefacts recovered from C18, C27, C41 and C44 (Table 2). The unworked material was diminutive in size, ranging in maximum length from 8-52mm, with most measuring less than 30mm in length (Fig 1). A small quantity of primary knapping debitage was found, including a core, flake debitage and angular shatter. A single core found in topsoil (02E1835:1:10) was based on a small beach pebble, measuring 31mm in length, which had been informally flaked without platform preparation, to produce only two flakes. A small number of flake debitage was also found, again mostly in topsoil (4/5 pieces). These included two complete bipolar flakes, and two complete platform flakes (one of which was a core trimming flake); an additional platform flake was found in C16.

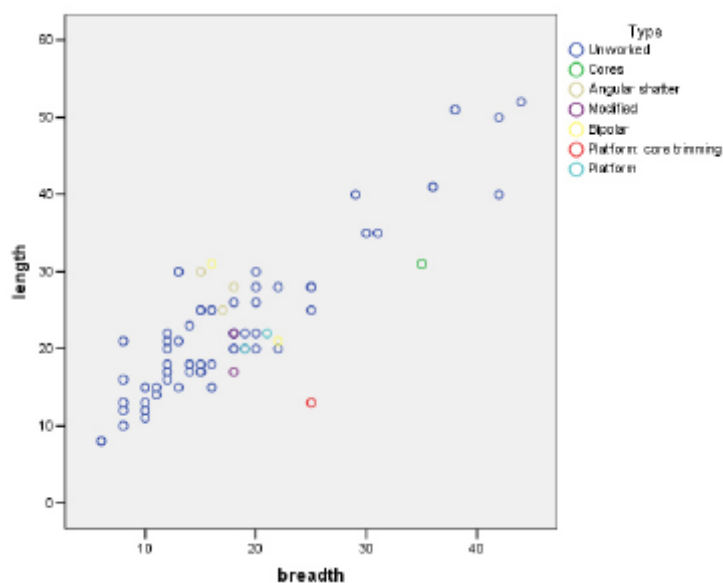


Fig 1: Dundalk Western Bypass: Newtonbalregan 1 (02E1835): showing length by breadth (mm) of all artefacts.

The platform flakes carried simple platforms, exhibiting little preparation prior to use: the flakes found in topsoil had planar and corticated platforms (the latter being found on the core trimming flake, and possibly having some limited edge preparation), and the example from C16 also had a corticated platform. The bipolar flakes measured 21-31mm in maximum length, with the platform examples measuring 13, 20 and 22mm; the core trimming flake was the smallest of these, at 13mm (Tables 1- 2). Three pieces of angular shatter were found in topsoil, all of which seem to be debitage relating to the knapping process; reflecting the remainder of the assemblage, all were diminutive, having a maximum length of 25-30mm. Two modified tools were found in topsoil (02E1835:1:1; 02E1835:1:2), only one of which (02E1835:1:2) pointed to prehistoric activity (Figure 8, Plate 2). This was a small thumbnail scraper, almost circular in form, with a steep convex scraping edge at its distal end and both lateral edges; this piece had suffered edge damage through post-depositional processes. The remaining piece is a possible gunflint blank, which seems to have been unused (02E1835:1:1) (Figure 8, Plate 1). It was produced by snapping the distal and proximal fragments off a blade, leaving the gunflint as the medial fragment; the blade itself was trapezoidal in section, partially corticated along the left lateral edge, and with a partial blade scar along the right lateral edge. Along the right lateral edge, some limited edge damage may have been created through post-depositional processes, or through use (perhaps for cutting), although the piece does not seem to have been used as a gunflint. Although gunflint has undergone limited analysis, the following tentative observations may be made. While it is slightly

irregular (in that it is slightly more rhomboid than rectangular), it bears most resemblance to 'platform' or 'prismatic' types, introduced from France during the late 18th century onwards (de Lotbiniere 1984). Its honey colour indicates that it is not of British production, and may be a French import or locally produced, and its small size suggests that it may have been used with a pocket pistol (ibid).

Discussion: NEWTONBALREGAN 1 (02E1835)

The small assemblage recovered from Newtonbalregan 1 is mainly populated by unworked material, and includes few artefacts which are the result of primary knapping processes, or secondary tool production, none of which were related. Consequently, it seems that very limited chipped stone technology was undertaken in the vicinity of the site, either during the prehistoric or historic periods. A small number of bipolar and platform flake debitage, and informal core, point to some limited flint reduction in the area, probably during the prehistoric period, spanning the Neolithic and Bronze Age periods; the presence of a thumbnail scraper points to activity specifically relating to the Final Neolithic/Early Bronze Age periods (Nelis 2003). Such limited activity, however, could merely be a single incidence of casual discard or loss across the landscape; similarly, the presence of a single gunflint also points to a single incidence of casual discard or loss, in this case during the Early Modern period, and it too appears unrelated to the remaining debitage assemblage. The gunflint itself does not appear to have been used for its purpose, and may have been a curated blank intended for use at a later stage; in the meantime, however, it is interesting to note that it may have served as a simple cutting tool, as needed, suggested by minimal edge damage along its sharp edge. Little further can be said on the dating of this piece, since little work has been done on the typology and dating of gunflint in an Irish context, however, it is similar to French platform or prismatic types found after the late 18th century (de Lotbiniere 1984).



Plate 1 Newtownbalregan 1.1: Gunflint: unused (02E1835:1:1)



Plate 2 Newtownbalregan 1.1: Thumbnail scraper (02E1835:1:2)