N7 Nenagh to Limerick High Quality Dual Carriageway
Archaeological Resolution Project
E2324: Gortnalalahagh Site 1
Final Excavation Report

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Townland: Gortnalalahgh
Parish: Stradbally
Barony: Clanwilliam
County: Limerick
OS 6” Sheet No.: LI006
NGR: 166876/160867

Excavation No.: E2324
ÆGIS Ref.: 1-11
Scheme No.: A026/000
Chainage: 3740
Client: Limerick County Council

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I. Abstract

This report details the licensed archaeological excavation of features uncovered during Phase 1 test trenching of the N7 Nenagh to Limerick High Quality Dual Carriageway. Phase 1 test trenching was carried out between January and March 2006 by ÆGIS ARCHAEOLOGY Ltd and Judith Carroll and Company under Ministerial Direction Number A026. During the testing within the townland of Gortnalagh Co. Limerick, the remains of a charcoal rich feature measuring 0.9 m x 0.7 m x 0.15 m deep (Collins 2006) were identified and given the sub-scheme number A026/171.

The excavation, conducted under Registration Number E2324, was carried out by ÆGIS ARCHAEOLOGY Ltd during November 2006 in accordance with the Directions issued by the Minister for the Environment Heritage and Local Government, following consultation with the National Museum of Ireland under the National Monuments Act (1930–2004) and in accordance with the Policy and Guidelines on Archaeological Excavations (Dúchas 1999). This site was designated Gortnalagh Site 1 for reporting purposes.

The archaeological resolution revealed the remains of the charcoal rich pit identified during the Phase 1 test trenching, in addition two hearths and a second pit, though this was found to be archaeologically sterile, were identified and excavated. A Preliminary Excavation Report (Wojtowicz 2008) was completed and submitted to the Archaeological Planning and Licencing Unit, National Monuments Service, Department of Environment Heritage and Local Government (DoEHLG) and to the National Museum of Ireland.

Based on the results of the excavation, combined with the specialist analyses carried out including the radiocarbon dates retrieved from the charcoal rich pit, the activity on site could be seen to be involved with the production of charcoal in the early medieval period. The charcoal rich pit was identified as a charcoal pit kiln with one of the hearths reinterpreted as a spread of ex situ material from the kiln. The second hearth was likely to have been used by those attending the charcoal kiln, serving as a source of heat and fulfilling other domestic functions.
ÆGIS ARCHAEOLOGY Ltd would like to express their thanks to everyone who aided in the completion of the excavation and reporting of the results of the excavation. In particular, to NRA Archaeologist Richard O’Brien, NRA Assistant Archaeologist Paul O’Keeffe, to the staff and excavation crew of ÆGIS ARCHAEOLOGY Ltd and to the specialists who carried out the post-excavation analysis.

The archaeological dimension of this project was funded in full by the client.
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III. Abbreviations and Terms Used

1σ The one sigma (1σ) calibrated expressed date range are equivalent to the probable calendrical age of the sampled material with 68% levels of confidence.

2σ The two sigma (2σ) calibrated expressed date range are equivalent to the probable calendrical age of the sampled material with 95% levels of confidence.

AODM This relates to the height above sea level and is given in meters.

Barony, Parish, Townland These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the country. The origins of these divisions are believed to be in the Early Medieval/Christian period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500).

BP Before Present where ‘present’ equals AD 1950

Cal. BC/AD The calibrated radiocarbon dates given in the report are the 2σ calibrated expressed date range. Details of the radiocarbon dates received and the sampled material are given in Section 9.2 of this report.

Context Each feature found during the excavations is allocated a number, commonly termed a ‘Context Number’ in order to record the archaeology.

DoEHLG Department of the Environment, Heritage and Local Government. This was the former governmental department whose heritage remit included a range of policy, regulatory, educational and promotional roles. The heritage functions were transferred to the Department of Arts, Heritage and the Gaeltacht with effect from 1 May 2011.

E East.

First Edition This relates to editions of the OS 6 inch maps for each county. The first edition map completed for the area dates to the early 1840s and this is referred to in the text as the “first edition”.

HQDC High Quality Dual Carriageway.

LI This number is the number of the site on the RMP map (see below). It begins with the county code, here LI for Limerick, the 6-inch sheet number, followed by the number of the archaeological site.

M Metres, all dimensions are given in metres or part of a metre, unless otherwise stated.

N North.

OS Ordnance Survey.

Ph Parish.

RMP Record of Monuments and Places. An update of the older SMR, (sites and monuments record), on which all known archaeological sites are marked and listed in an accompanying inventory. The sites marked afford legal protection under the National Monuments Acts 1930-2004. The record is based on the 6-inch map series for the country and is recorded on a county basis.

S South.

Sheet This relates to the 6-inch map for each county, which are divided into sheets and numbered accordingly.

Td Townland.

W West.
1. Introduction

1.1 Project Background

ÆGIS Archaeology Limited was contracted by Limerick County Council to undertake archaeological excavations in advance of the N7 Nenagh to Limerick High Quality Dual Carriageway. The western end of the scheme starts at the existing Newport Junction in the townlands of Carrowkeel and Mountshannon, Co Limerick, and runs north-east. The scheme ends at Nenagh in the townland of Ballintotty, Co. Tipperary, where the existing N7 Nenagh Bypass will be widened to accommodate the new road. The total length of the proposed route is 35.7 km.

Phase I test trenching to determine the character, nature and extent of any archaeological material was undertaken by ÆGIS Archaeology Limited (Contract 1) and Judith Carroll & Co. (Contract 2) between January and March 2006, under Ministerial Direction Number A026. During testing a charcoal rich feature was found and assigned scheme sub-number A026/171. ÆGIS ARCHAEOLOGY Ltd excavated this site under Ministerial Direction Number A026, Registration Number E2324.

Excavations were conducted in accordance with the Directions issued by the Minister for the Environment Heritage and Local Government following consultation with the National Museum of Ireland under the National Monuments Acts (1930-2004) and in accordance with the Policy and Guidelines on Archaeological Excavation (Dúchas 1999).

1.2 Location & Existing Environment (figs 1 & 2)

Gortnalagh Site 1, (NGR 166876/160867), was located in the townland of Gortnalagh, the parish of Stradbally and in the barony of Clanwilliam Co. Limerick approximately 2 km south of Castleconnell. The site was situated at 42 m AODM within an area of low lying pasture prone to water logging. The underlying geology of the area was identified in the Environmental Impact Statement (EIS) as a variety of rock types (Gowen 2003), being
composed of Silurian Quartzite, Old Red Sandstone, Carboniferous Limestone, Upper Avonian Shales, and Amorphous Sandstones.

Two other sites were excavated within the townland of Gortnalahagh. Gortnalahagh Site 1 was located approximately 210 m north-east of Gortnalahagh Site 3 E2322, which consisted of a hearth and several pits dated to the Bronze Age, Iron Age and post-medieval period (Scotland 2011b), and approximately 40 m to the north-east of Gortnalahagh Site 2 E2323, which consisted of a fulacht fia dated to the Middle Bronze Age (Scotland 2011c). Twelve other sites were excavated by ÆGIS ARCHAEOLOGY Ltd and Headland Archaeology (Ireland) Ltd. within the parish of Stradbally, the majority of which were identified as Bronze Age in date. Further early medieval activity was recorded at Richhill Site 2 E2311 (Clark and MacLeod 2009) and Sallymount Site 1 E3420 (Clark and Long 2010).
1.3 Historical and Archaeological Background (fig 3 & 4)

(This section has been summarised, with additions, from Margaret Gowen & Company 2003 Archaeological and Cultural Heritage Section in: Environmental Impact Statement.)

A number of archaeological sites ranging from the prehistoric to the post medieval period were identified within the general area of the proposed N7 route. Monuments from the Neolithic (c. 4000–2300 BC), Bronze Age (c. 2300–500 BC), Early Christian/early medieval (AD 500–1100), Medieval and Post-Medieval Periods are particularly well represented in the study area.

The Neolithic Age saw the arrival of the first farmers who left behind them artifactual evidence such as the stone axe heads, examples of which have been found in the townlands of Shower and Annaholty. In Co. Tipperary, Neolithic settlement was most prevalent in the north and west of the county. From archaeological investigations along the Nenagh Bypass in the late 1990’s a Neolithic site in Tullaheddy (TN020-079---) was revealed and also a habitation site of possible Neolithic date in association with later Bronze Age activity was encountered in...
Lahesseragh (TN020-137--). The archaeological potential of the bog through Gooig and Annaholty is reflected in a number of stray finds. A Neolithic spearhead and fragments of two polished stone axes were among the items discovered.

The Bronze Age was characterised by a considerable expansion of settlement and in north-west Tipperary extensive Bronze Age occupation is known to have occurred with the discovery during excavations on the Nenagh Bypass of a house site in Lahesseragh (TN020-136---) and a possible structure in Lisatunny (TN021-099---).

The concentration of burial mounds, standing stones, wedge tombs and fulachtai fia also shows that the Kilmastulla River Valley and its surrounding areas flanked by the Arra and Silvermines Mountains was particularly attractive to Bronze Age settlers. During topsoil stripping along the Nenagh Bypass a number of fulachtai fia were found within the townlands of Tullahedy (TN020-132001-, -002, -003), Lahesseragh (TN020-135---) and Ballintotty (TN021-098---).

One of the most common monuments in the region is the ringfort which dates from the Early Christian or medieval period. A ringfort generally consists of a circular area defined by one or more banks and external ditches, although examples such as that in Ballyhisky (TN02-071---) consist of a raised platform surrounded by a ditch with traces of a bank. Many of the ruined churches visible in the landscape on either side of the route date from the medieval period. There is a church and graveyard at Ballyard (TN031-010001), and in Kilmastulla (TN025-077) along the existing N7. Originally, many of these churches would have been associated with settlements, but the Reformation, 17th century religious wars and rural reorganisation under the subsequent estate system led to their abandonment.

The Normans came to Ireland and brought new military traditions, fortifications, new languages and social structure. These settlers introduced the Anglo-Norman way of life, founding manors, abbeys, boroughs and towns. The distribution of Anglo-Norman towns and boroughs in Tipperary is largely concentrated in the lowlands east of the River Suir, with Nenagh being the only large town in the north of the county. Some early fortifications include a possible motte site in Ballycahill and a motte and bailey in Tullahedy. A hall-house was also encountered during monitoring on the Nenagh bypass in Ballintotty (TN021-094) and was excavated in 1998. The stone castle and tower house are characteristic features of the Anglo-
Norman fortified manor. There are a number of tower houses in the region such as, for example, Ballintotty (TN020:055001).

In the seventeenth century the strategic importance of the Shannon waterway assisted in the infiltration of new English settlers, providing a navigable route into Limerick and Tipperary. One of the main features of this period was the stone manor house also referred to as the ‘big house’. Big houses were constructed by planter families and they are often found on the sites of older ruined castles or tower houses. They often gave rise to ornamented demesne lands close to the house, such as at Mountshannon, located at the south-western end of the project.

The townland name, Gortnalahagh is derived from the Irish Gort na Lathach and can be translated to mean ‘the field of the muddy place’ (Place Names Database of Ireland, www.logainm.ie), with ‘Gort’ meaning a tilled field, particularly a field producing cereals (Flanagan & Flanagan 1994, 93). The name of the parish, Stradbally comes from the Irish Sraid-Bhaile or street town. The Annals record that a second name for the place Caislean Ui Chonnaig, which later changed to Caislean Ui Chonaill, supposed to mean O'Connell's Castle, though O'Donovan (1840) states that no one of that name ever possessed the castle.

The castle at Castleconnell is situated at the south end of the town in the townland of Coolbaun. Tradition recalls that this castle was built by the O'Briens in AD 1201 (Spellissy 1998, 33) but was destroyed in AD 1690 by General Ginkle. There is also a church of Stradbally at Castleconnell. At the time of writing though, O'Donovan recorded that the church was much ruined, but the graveyard adjacent was still used extensively (O'Donovan 1840). Castleconnell village itself was a popular spa in the late eighteenth and nineteenth centuries with waters resembling those in Spa, Germany (Lewis 1837, 293). Lewis also notes that limestone was abundant in the parish, though he does not note whether this was used for industrial or agricultural purposes.

Nothing of historical interest could be found regarding the townland of Gortnalahagh with the townland not appearing in the Down Survey maps of 1656 and two small structures the only features of note in the first edition map of the townland, dated to 1840–1841. Three RMPs are located within the immediate vicinity of Gortnalahagh Td, RMP, LI006-011--- (enclosure), is located within the townland of Sallymount being incorporated into a farmyard,
and a further two enclosures, LI006-009--- and LI006-010---, located within the townland of Park.
1.4 Previous Archaeological Investigations

With the exception of the N7 Nenagh to Limerick HQDC programme of archaeological investigations, no previous archaeological investigation have been undertaken within the townland of Gortnalahagh, Co. Limerick or within any neighbouring townlands (as per a search of the archaeological database www.excavations.ie which lists all licenced archaeological investigations to 2007 at present).

As part of the N7 Nenagh to Limerick High Quality Dual Carriageway, a number of archaeological investigations were carried out within the immediate vicinity of the site. The site was identified in 2006 during the Phase 1 test trenching and was described as containing a charcoal rich sub-circular feature measuring 0.9 m x 0.7 m x 0.15 m deep and filled with a dark blackish brown sandy silt and fire reddened clay (Collins 2006). The Phase 1 test trenching also identified a number of other, previously unidentified sites within the immediate area, with sites Gortnalahagh Site 2 E2323 and Gortnalahagh Site 3 E2322 located within the townland.

1.5 Excavation Methodology

The excavation undertaken at Gortnalahagh Site 1 was carried out in accordance with the agreed method statement submitted with Ministerial Sub-Direction Form 4A-06. The site was excavated by hand using single context recording.

The site was identified during Phase I testing and originally assigned the scheme sub-number A026/171. The subsequent excavation by ÆGIS ARCHAEOLOGY Ltd was conducted under Registration Number E2324, and termed Gortnalahagh Site 1.

ÆGIS ARCHAEOLOGY Ltd uses a context method of archaeological recording and has standard operating procedures for same (SOPS). This approach is fully detailed in the company’s Quality Manual that is available on request. The method provides for pro-forma pre-printed recording sheets for all aspects of recording (written, drawn and photographic), thereby ensuring a smooth transition from on-site resolution to post-excavation reporting. This paper record forms the basis of the site archive. The Registration Number was used in the recording of the archive, as well as artefacts and ecofacts. Any finds recovered during the excavation
were bagged and recorded according to Registration Number, context number, and unique identifier number e.g. 1-infinity within that context (following NMI guidelines).

All resolved sites have been surveyed.

All finds are stored in secure storage at the ÆGIS office, Limerick. All finds requiring conservation will be stored as per specialist advice and packaged as per National Museum of Ireland guidelines.

Upon completion of the excavation all pertinent samples and finds were analysed by the appropriate specialists, the reports of which have been incorporated into this report and inserted as appendices (see Section 9). Arrangements will be made, in consultation with the NRA Archaeologist, to deposit all finds with the NMI and for the long-term storage of the site archive.
2. Context List

2.1 Context List

This is the entire context list for the excavation at Gortnalahagh Site 1 which consisted of two pits, one charcoal rich and identified as a charcoal pit kiln, a hearth and a charcoal rich spread.

<table>
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<tr>
<th>Context Number</th>
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<tbody>
<tr>
<td>50</td>
<td>Stiff black sandy silt fill of C51</td>
</tr>
<tr>
<td>51</td>
<td>Hearth filled by C50</td>
</tr>
<tr>
<td>52</td>
<td>Soft black sandy silt fill of charcoal pit kiln C53</td>
</tr>
<tr>
<td>53</td>
<td>Charcoal pit kiln filled by C52</td>
</tr>
<tr>
<td>54</td>
<td>Cancelled</td>
</tr>
<tr>
<td>55</td>
<td>Friable dark brown sandy silt fill of pit C56</td>
</tr>
<tr>
<td>56</td>
<td>Pit filled by C55</td>
</tr>
<tr>
<td>57</td>
<td>Soft black silt spread</td>
</tr>
<tr>
<td>58–61</td>
<td>Cancelled</td>
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Table 1: Context List
3. Stratigraphic Sequence

3.1 Matrix

The first stage of report compilation is the formation of the site matrix. This structure collates all the contexts that have been excavated and recorded, and preserves their stratigraphic relationships in flow chart fashion. The interpretation of a site rests on this visual manifestation of the archaeology as excavated. The contexts of the matrix are then grouped and segmented to create features and phases, all of which are described in detail below (Section 3.2 Context Descriptions).
3.2 Context Descriptions

Note: Contexts are grouped into features and are referred to by their cut context numbers. All features were located directly beneath the topsoil and cut/overlay the natural parent material, unless otherwise stated.

Context C50
For a description of C50 refer to context C51 (Cut)

Context C51 (Fig. 5)
Context Type: Hearth
Fill: C50
This context consisted of a north–south orientated hearth, measuring 0.5 m by 0.4 m by 0.05 m deep. The feature was sub-circular in plan, with an imperceptible break of slope top, concave sides, imperceptible break of slope base and flat base. It was filled by stiff sandy silt, C50, with frequent charcoal inclusions. It appeared that the feature originally had a greater depth but was truncated during topsoil stripping.

Context C52
For a description of C52 refer to context C53 (Cut)

Context C53 (Fig. 5 & 6; Plates 4 & 5)
Context Type: Charcoal pit kiln
Fill: C52
This context was a north-east–south-west orientated pit, measuring 1.67 m by 0.98 m by 0.1 m deep. The feature was sub-rectangular in plan, with a sharp break of slope top, concave sides, moderate break of slope base and flat base. It was filled by soft black sandy silt, C52, with frequent charcoal inclusions.

Context C54
Cancelled

Context C55
For a description of C55 refer to context C56 (Cut)

Context C56 (Fig. 5)
Context Type: Pit
Fill: C55
This context was a north–south orientated pit, measuring 0.4 m by 0.3 m by 0.03 m deep. The feature was sub-circular in plan, with rounded corners, sharp break of slope top, gradual sides, gradual break of slope base and concave base. It was filled by friable dark brown sandy silt, C55, with occasional inclusions of small stones.
Context C57 (Fig. 5)
Context Type: Spread
This context was a NNW–SSE orientated hearth, measuring 1.5 m by 0.5 m by 0.03 m deep. The feature was oval in plan, with an imperceptible break of slope top, imperceptible break of slope base and uneven base. It was filled by soft black silt, C57, with frequent charcoal inclusions. The feature was located above an oxidised layer of natural. It appeared that the feature originally had a greater depth but was truncated during topsoil stripping.

Context C58–C61
Cancelled
4. Interpretation & Discussion of Stratigraphy

4.1 Interpretation of the Archaeological Stratigraphy

In total four features were excavated during the archaeological investigations at Gortnalaghagh Site 1. These features consisted of a hearth, a spread and two pits, one of which was used for the production of charcoal. All four features were located below the topsoil and cut into the underlying natural subsoil. In light of this stratigraphical relationship it is postulated that the hearth, the spread and the charcoal production pit, were all contemporary.

The hearth, C51, the spread C58, and the charcoal pit kiln, C53, contained evidence of in situ burning in the form of an underlying layer of oxidised clay natural. In addition, each of these features was filled by a single charcoal rich context, suggesting they contained the residual waste and/or product from the last event of their use.

Pit C56 appeared to have been filled naturally by a silt rich context, C55. Though a small amount of charcoal was retrieved from the fill of pit C56 there was no clear evidence that this feature was related to the rest of the activity on site.
4.2 Discussion

Three of the features excavated at Gortnalagh Site 1, that is the hearth, spread and charcoal production pit kiln, all appeared to represent a single activity; namely charcoal production. Charcoal was an important raw material used within a number of activates throughout the prehistoric and historic periods. For example charcoal was used in the production of tar, wood oils and for dyeing (Kelley 2002, 29). Maybe most noteworthy is the use of charcoal in metal working, being an integral component in achieving the high temperatures needed in both the smithing and smelting processes. Though there have been few studies into early Irish metal working and related activities, charcoal production has become synonymous with metal working. Charcoal is created by carefully regulating oxygen levels while wood is smouldered, in essence removing the moisture and carbonising the wood while not completely burning it. Two common types of charcoal production were utilised in Ireland, the pit kiln and the mound kiln. The mound kiln was formed by resting timber on a vertically set central post which would be covered by straw, earth and turf. A similar process was seen in the pit kilns with timbers placed within the pit and covered by earth and timber. Once the kiln had been set and fired it was necessary to continually, and carefully, monitor the process to regulate the heat and repair any cracks in the covering which would occur due to the reduction in size of the wood. Where apparent in the archaeological record these features appear as either cut features with charcoal rich fills or as spreads of charcoal. The exposed edges of the cut also show signs of in situ burning. Recent experiments conducted by Niall Kenny and Brian Doaln (http://charcoal.seandalaiocht.com/index.html) have shown that some skill was needed in the placing of the timber and the regulating of the firing process for any meaningful quantities of charcoal to be produced. The sighting of these features appear to have been carefully chosen, regularly placed near to the source of wood; presumably to cut down on the cost of the raw material as vast amounts of wood would be consumed in the production of any significant amount of charcoal (Kelley 2002, 5; Mitchell and Ryan 1997, 212). The resulting charcoal from a successful firing would represent only approximately ten percent of the raw material started with.

During the excavations conducted as part of the N7 Nenagh to Limerick HQDC eight other sites consisting of, or including charcoal production pits, were excavated; in addition a further three sites excavated within the Parish of Stradbally, Gardenhill Site 1 E2320 (Scotland 2011a), Gortnalagh Site 3 E2322 (Scotland 2011b) and Sallymount Site 2 E2333 (Scotland 2011d) contained possible charcoal production features. Other large infrastructure works
have also uncovered charcoal production features, for example the M4 Kinnegad-Enfield-Kilcock motorway (Carlin et al 2008), the N8 Cashel to Mitchelstown road scheme (McQuade et al 2009) and the N25 Kilmacthomas realignment (Johnston et al 2008). In many instances, like Gortnalahagh Site 1, these features appear in isolation away from any large habitation. This would underline the preference in sighting these close to the source of wood. Though, as increasing areas were deforested for arable purposes, it is possible that the charcoal production sites may have, on occasion, been placed nearer to settlement sites to make use of the timber felled. Charcoal production sites have also been found in conjunction with metalworking sites. For instance, from one of the metal working sites along the N7, Garraun Site 1 E2494, a possible spread of metal working waste with associated furnace, two refining hearths and charcoal production pits were excavated (Long 2009).

As these features are connected to the metal working process these are frequently seen to date from the Iron Age through to the post-medieval to early modern period. A radiocarbon date was retrieved from charcoal, identified as oak brushwood, from the fill of the charcoal production pit. This date, cal AD 870–1010 (Beta-258959), shows the use of the charcoal production pit to be during the latter part of the early medieval period. It should be noted that the results of dating oak charcoal should be reviewed and interpreted with some caution. This is due to the properties of hardwoods and oak in particular, this is frequently referred to as the ‘old-wood problem’. What this signifies is that as certain woods, particularly hardwoods, are long lived, with oak being the most notable in Ireland, a significant off-set can be caused. This results in the date received being earlier than the actual date. Other factors, namely seasoning of the wood or episodes of re-use, can add to this offset. If the ‘old-wood problem’ has had an effect on the date received from Gortnalahagh Site 1 the age offset is likely to be small. As the sample sent for dating was identified as oak brushwood, the offset is much smaller than that from a sample from the heartwood and the fragment is unlikely to have been seasoned or have been used prior to burning (Bowman 1990, 51).

The identification of the entire sample from the charcoal pit kiln as oak charcoal is also of interest; a total 256 grams of charcoal was recovered from the two samples taken from CS2 with all being identified as oak. It is likely that oak had purposefully been selected for the charcoal production, with the sample being either the charcoal produced and not suitable for use or of the fuel used. As the palaeoenvironmental analysis of the samples collected during the excavations showed the charcoal not to have been heavily abraded (see Appendix 9.3), it
is likely that this is uncollected remains of the charcoal produced; be it unsuitable for use or just not collected. Oak charcoal is seen as the preferred type of charcoal by the early smelter (Tylecote 1962, 190) as it has a higher calorific count, therefore it burns longer and hotter than other types. Scott (1990, 167) suggests that, from evidence at Reask Co. Kerry, different types of charcoal was selected for different processes with hardwoods, such as oak, selected for smelting and peat utilised for bloomsmithing and forging. The selection of hardwoods (oak, yew and holly) was also noted from the Beaker/Early Bronze Age mine at Ross Island, being used for the processing of ores in pit furnaces (O’Brien 2004, 469). It is therefore possible that the charcoal being produced was intended in the smelting of ores.

Though three of the four features excavated at Gortnalahagh Site 1 showed evidence of in situ burning, it is only the largest of these, sub-rectangular pit C53, which appears to have been used for the production of charcoal. It is only the charcoal from this pit that is not abraded which shows it remained in situ and had not be moved during its firing; such as can be caused by the stoking of hearths for example. From the size and shape of C51 it would appear that this feature was a hearth and likely to have been used by those attending the charcoal kiln. The process in converting the timber to charcoal could have taken a number of days (Carlin, in Carlin et al 2008, 89) and the hearth was likely to have been used in a domestic context; though the charcoal kiln itself could have provided heat the use of a hearth for cooking may have been required so as not to damage the charcoal kiln in such away to increase the oxygen level and cause a misfire. Though no structural evidence was found, the hearth may have been in association with a slight temporary structure sighted a safe distance away from the charcoal kiln. The spread of material located to the south of the charcoal kiln, from its irregular shape and close proximity to the charcoal kiln, is believed to be material removed from the upper surfaces of the charcoal kiln (i.e. the outer lining), or waste material not suitable for use. The palaeoenvironmental analysis of the charcoal from C57 showed it to be more abraded and therefore possibly ex situ. Pit C56 was very small, shallow with no evidence to suggest its purpose.

Generally the features excavated at Gortnalahagh Site 1 would appear to consist of a charcoal production pit kiln, with an associated hearth and a spread of ex situ material. The hearth may have been utilised in conjunction with a simple structure to give some shelter to those tending the charcoal kiln. Though charcoal was used for several purposes, some of which were given above, it is possible that the charcoal was produced to be used in the smelting of ores. From the results of excavations carried out within the vicinity of Gortnalahagh Site 1, it
is possible that a series of charcoal kilns were operating within the area; a similar date was retrieved from a charcoal rich spread excavated on Sallymount Site 2 E2333 which may be the remains of a mound kiln. However the possible charcoal production pit kilns excavated at Gardenhill Site 1 E2320 and Gortnahagh Site 3 E2322 were not securely dated (Scotland 2011a; 2011b) and may show a continuing practice rather than a widespread short lived industry. The pit kiln excavated on Gortnahagh Site 1, in addition to the further three possible kilns in the area, from their location could have been utilised to supply charcoal to Castleconnell or even the settlement at O’Brien’sbridge or the burgeoning urban population of Limerick.
5. Conclusions

The area investigated at Gortnalahagh Site 1 under Registration Number E2324 was a rurally situated site, consisting of four features, three of which contained large quantities of charcoal. It is likely that these are the remains of a single charcoal production pit, dated to the early medieval, with associate activity.

The early medieval date received from the fill of the charcoal production pit suggests that the site was in use sometime between the end of the ninth century AD and the beginning of the 11th century AD. The charcoal production pit is consistent to other excavated forms, and may be best described as a pit kiln. From the analysis of the charcoal remains within the pit kiln, it is likely that the production of oak charcoal was being undertaken. It is likely that the charcoal was used in early medieval ironworking, and due to the properties of oak, it allowing for longer and hotter burns, it is possible that the charcoal was being produced for the smelting process.

Further early medieval activity was recorded during the excavations conducted as part of the N7 Nenagh to Limerick HQDC within the area of Gortnalahagh Site 1. Occupation was recorded at Richhill Site 2 E2311 (Clark and MacLeod 2009) and Sallymount Site 1 E3420 (Clark and Long 2010), with more dispersed features recorded at Gardenhill Site 1 E2320 (Scotland 2011a), Gortnalahagh Site 3 E2322 (Scotland 2011b) and Sallymount Site 2 E2333 (Scotland 2011d). The radiocarbon dates from Richhill Site 2 and Sallymount Site 1 were earlier than the two dates from Gortnalahagh Site 1. However the two Sigma radiocarbon date received from Gardenhill Site 1 and Sallymount Site 2, both of which returned a date of cal AD 890–1030, were remarkably similar to the date of cal AD 870–1010 from Gortnalahagh Site 1. The early medieval date from Sallymount Site 2 was retrieved from a possible charcoal
mound kiln which would suggest that the production of charcoal was being carried out in several locations within the Parish of Stradbally. Further possible charcoal production kilns were located at Gardenhill Site 1 and Gortnalahagh Site 3 though these features were not individually dated; early medieval activity was recorded on Gardenhill Site 1 as was late medieval activity with Bronze Age and Iron Age activity recorded on Gortnalahagh Site 3. Though by no means conclusive, it can be suggested that the wider area was being exploited by a particular group or groups of people between the late ninth and early 11th century AD with charcoal production forming part of the activities taking place. As these sites were frequently placed closer to the source of timber than the intended recipient it is possible that the charcoal was intended as far afield as Limerick city. Combined with the earlier medieval dates and prehistoric dates received from the other sites excavated in this area, we can see clearly continued occupation and exploitation of the local environment on the banks of the river Shannon.

In conclusion, the site of Gortnalahagh Site 1 consisted of a number of features related to the production of charcoal. Though not conclusive, the early medieval activity may be related to activity recorded during previous excavations within the area, including those conducted as part of the N7 Nenagh to Limerick HQDC. Though constituting a small site, in conjunction with the excavations carried out within this area, it clearly shows the continued use of the area throughout the prehistoric and historic periods.
6. The Quantity of Materials

6.1 The Archive

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<tr>
<th>Item</th>
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<tr>
<td>Drawing Registers</td>
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<td>Average</td>
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<tr>
<td>Finds Registers</td>
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<td>-</td>
</tr>
<tr>
<td>Photo Registers</td>
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<td>Average</td>
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<td>Sample Registers</td>
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<td>Average</td>
</tr>
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<td>Good</td>
</tr>
<tr>
<td>1:20 Sections (A3)</td>
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<td>-</td>
</tr>
<tr>
<td>1:10 Plans (A3)</td>
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</tr>
<tr>
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</tr>
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<td>1:50 Plans (A3)</td>
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<td>Good</td>
</tr>
<tr>
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<td>-</td>
</tr>
<tr>
<td>Digital Photographs</td>
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<tr>
<td>Print Photographs</td>
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</tbody>
</table>

Table 2: Quantity of Materials
6.2 Finds List

No finds were recovered from Gortnalahagh Site 1

6.3 Sample List

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Context Number</th>
<th>Context Description</th>
<th>Sample Type</th>
<th>Processes Completed</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Fill of hearth C51</td>
<td>Bulk soil</td>
<td>Wet sieving; palaeoenvironmental analysis</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>Fill of pit C56</td>
<td>Bulk soil</td>
<td>Wet sieving; palaeoenvironmental analysis</td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>Fill of charcoal kiln</td>
<td>Bulk soil</td>
<td>Wet sieving; palaeoenvironmental analysis</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>Fill of charcoal kiln</td>
<td>Bulk soil</td>
<td>Dry sieving; palaeoenvironmental analysis</td>
</tr>
<tr>
<td>7</td>
<td>57</td>
<td>Charcoal rich spread</td>
<td>Bulk soil</td>
<td>Wet sieving; palaeoenvironmental analysis</td>
</tr>
</tbody>
</table>

Table 3: Sample List

Archaeological Survey of Ireland, 1997 RMP Constraint Maps and Inventory for County Limerick, Dublin.


7. Project References


Environmental Protection Agency 1995 Advice Notes on current practice. Dublin: Environmental Publications.


O’Brien, W. 2004 Ross Island. Mining, Metal and Society in Early Ireland. National University of Ireland, Galway: Department of Archaeology.


Ordnance Survey 1996 Discovery Series No. 58 covering part of Clare, Limerick and Tipperary, 1:50,000. Dublin: Ordnance Survey Ireland.
Ordnance Survey 1997 Discovery Series No. 65 covering part of Clare, Limerick and Tipperary, 1:50,000. Dublin: Ordnance Survey Ireland.


Scott, B. G. 1990 Early Irish Ironworking. Belfast: Ulster Museum


http://charcoal.seandalaiocht.com/index.html

www.archaeology.ie

www.excavations.ie

www.logainm.ie
8. Signing off Statement

Archaeological Firm: ÆGIS ARCHAEOLOGY LIMITED

Writers: Lee Scotland BA
ÆGIS ARCHAEOLOGY Ltd
32 Nicholas Street,
King’s Island,
Limerick

Client: Limerick County Council

Signed: ______________________________
For ÆGIS ARCHAEOLOGY LIMITED

Dated: July 2011

ÆGIS ARCHAEOLOGY LIMITED
REF.: 1-11
9. Appendices

9.1 Site Plans & Sections
9.2 Radiocarbon Dating

The radiocarbon dates were obtained from Beta Analytic, Florida USA. Calibrations were calculated using the IntCal04 calibration dataset (Reimer et al. 2004).

Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Context No.</th>
<th>Context Description</th>
<th>Quantity</th>
<th>Weight</th>
<th>ID</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Fill of hearth C51</td>
<td>1 fragment</td>
<td>n/a</td>
<td>n/a</td>
<td>Too small for identification</td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>Fill of charcoal pit kiln</td>
<td>½ full - 2⅓ litre bag</td>
<td>98 g</td>
<td>Oak (Quercus sp.)</td>
<td>1 fragment of brushwood (0.38 g) extracted</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>Fill of charcoal pit kiln</td>
<td>2⅓ litre bag</td>
<td>158 g</td>
<td>Oak (Quercus sp.)</td>
<td>-</td>
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</table>

Table 4: Summary of Radiocarbon Dates

In advance of the radiocarbon process the charcoal sub-samples, retrieved from samples 1, 4 and 6, were identified by Ellen O’Carroll MA to species:
9.3 Palaeoenvironmental Analysis

Palaeoenvironmental samples assessment for Gortnalahagh Site 1, E2324

By: Karen Stewart

Introduction
Five samples taken during excavation are here discussed. Three were taken from fills of two pits with the remaining samples being from a spread and a hearts. The flots of these samples have been assessed for palaeoenvironmental potential and the results of this assessment are discussed herein.

Methodology
All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers et al (2006).

Results
The results are summarised below in Tables 1 (flot assessment). All plant remains were preserved through charring.

Wood charcoal
Charcoal was recovered from samples 4 and 6, both taken from (52). Though fractured, the charcoal is very well preserved with little evidence of abrasion. The charcoal from samples 4, 6, and 7 was of a size and quality suitable for section for wood species identification and thus AMS radiocarbon dating.

Discussion
Samples 4 and 6 were both taken from (52) which has been preliminarily interpreted as the fill of a charcoal production kiln (53) (Scotland forthcoming). The lack of abrasion indicates that the material was probably not exposed or transported to any great degree once charcoalisation had taken place. This would support the feature’s interpretation as a charcoal production pit.

Sample 7 was taken from (57), interpreted as ex situ material possibly from the cover to the charcoal production kiln, or waste material unsuitable for use (ibid.). The charcoal from this feature was more heavily fragmented than that from (53), which would suggest that it was unlikely to have been created or buried in situ.

Recommendations
Wood species identification of the charcoal is recommended as it may allow for the reconstruction of fuel selection strategies at the site. Charcoal from any of the sample 4, 6 and 7 is recommended for use in dating.
References
Cappers R.T.J., Bekker R.M. and Jans J.E.A. 2006 *Digital seed atlas of the Netherlands.* Barkhuis Publishing and Groningen University Library, Groningen


Table 1: Composition of flots

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Context number</th>
<th>Total flot vol. (ml)</th>
<th>Charcoal</th>
<th>Quantity</th>
<th>Max size (cm³)</th>
<th>AMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>2</td>
<td></td>
<td>+</td>
<td>&lt;0.5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>10</td>
<td></td>
<td>+</td>
<td>&lt;0.2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>50</td>
<td>++++</td>
<td>5</td>
<td>*</td>
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</tr>
<tr>
<td>6</td>
<td>52</td>
<td>15</td>
<td>++++</td>
<td>2</td>
<td>*</td>
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<td>57</td>
<td>15</td>
<td>+++</td>
<td>&lt;0.5</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant
* = sufficient sized charcoal for identification and AMS dating