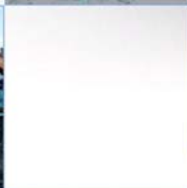
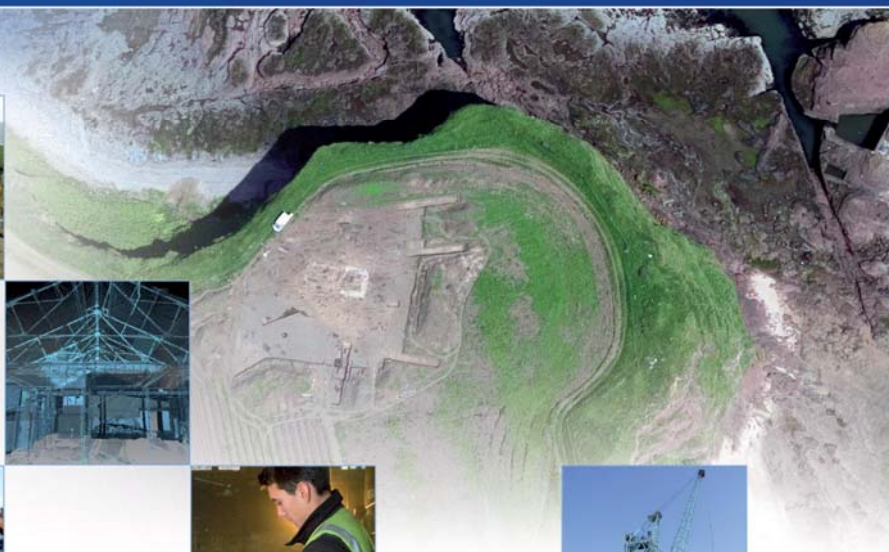


Keppoch HEP, Roybridge Metal Detecting Survey and Watching Brief:

Written Scheme of Investigation

OASIS Number: aocarcha1-112684

26th October 2011



ARCHAEOLOGY

| HERITAGE

| CONSERVATION

1 INTRODUCTION

1.1 Project Background

- 1.1.1 AOC Archaeology Group has been commissioned by Green Highland Renewables Ltd on behalf of their client, to undertake an archaeological metal detecting survey and watching-brief during ground breaking works associated with the construction of a hydro scheme and associated infrastructure, at Coillie Diobhain, Roy Bridge (Planning Ref: 11/01200/FUL). This site is within the local authority administrative area of Highland Council, which is advised on archaeological matters by Historic Environment Team (HET). This work will accord with the policies outlined in SPP (Scottish Government 2010), *Planning and Archaeology* (Scottish Government 2011) and will follow HET Development Guidance and Institute for Archaeologists' standards for Desk-Based Assessments.
- 1.1.2 This *Written Scheme of Investigation* details how the requirements of the project will be met. The first part is site specific while the Appendices detail AOC Archaeology Group's operating procedures and standards.

1.2 Site Location and Description

- 1.2.1 The proposed development area is located to the immediate north of Roybridge, on the western slopes of Maol Ruadh (centred NGR: NN 2274 7828). The route of the proposed scheme runs from NGR: NN 2265 7831 to NN 2279 7821 (Figure 1). The proposed development is bounded by a conifer plantation to the north, a minor road to the south and moorland to the east and west, and lies above Glen Roy.

1.3 Archaeological Background

- 1.3.1 The proposed development lies within the area identified as the location of the Battle of Mulroy (NMRS: NN28SE1; Highland Council SMR: MHG4273; Figures 1 and 2), which was fought between fought between Mackintosh and his clan Chattan allies and the McDonalds of Keppoch and their allies (NSA 1845). The battle, which took place immediately prior to the 1688 rebellion, is considered as the last of the clan battles (NSA 1845). The battle, is listed in Scotland's Historic Fields of Conflict (UKFOC Number 478; 2005) and is on the Historic Scotland Consultation List (<http://www.historic-scotland.gov.uk/index/about/consultations/battlefieldconsultation.htm>). A full account biography of the battle is provided in Appendix A.
- 1.3.2 Although the Battle of Mulroy is said to have taken place on the southern lower slope of Maol Ruadh, the MacDonalds' are recorded as having spent the night before the battle on the higher ground above the battle (Appendix A). The possibility of initial skirmishes taking place, including an hour long firefight, has been suggested, implying the proposed Macdonalds' camp may contain evidence for the battle itself.
- 1.3.2 More generally, a settlement has been known to exist at the village of Roybridge to the immediate south of the development area, since 1750, when General Roy recorded both settlements and associated tracks in Glen Roy. The post-medieval expansion of the area was encouraged by the construction of Telford's Laggan Road through Glen Spean and a bridge over River Roy in 1818 (Smith 2001, 810).

- 1.3.3 There are no other previously recorded heritage assets within the site proposed development.

2 OBJECTIVES

- 2.1 The objectives of the archaeological watching brief are:
- i) to safeguard the archaeological resource that may be disturbed by the proposed development works;
 - ii) to liaise with HET and the client in the event of significant archaeological features and /or small finds being unearthed as to the most appropriate response in safeguarding these features either by preservation *in situ*, if at all feasible, or by archaeological recording.

3 METHODOLOGY

- 3.1 Prior to the start of any ground breaking works, the route of the hydro scheme will be the subject of a metal detecting survey. The metal detector survey will be undertaken using Whites M1 metal detectors (primary detector and smaller unit for detailed location). The metal detecting area will be walked in transects no greater than 3 m wide. This will allow for a degree of overlap between transects in ensuring ground is not missed. The transects will be marked out prior to the survey beginning. Findspots will be marked and surveyed to allow accurate plotting of find densities and artefact types.
- 3.2 The Watching Brief will adhere to this Written Scheme of Investigation. All ground-breaking works involved in the installation of the hydro scheme will be monitored by an experienced project supervisor. The default response to the discovery of any archaeological material will be allowing its preservation *in situ* by moving hydro route away from any significant deposits or features.
- 3.3 The Watching Brief will also include the excavation of any archaeological features encountered (should preservation *in situ* prove infeasible) in order to establish the extent, condition, character, quality and date of any archaeological features impacted upon by these works.
- 3.4 Where small discoveries (those requiring less than two hours to deal with) are encountered, these will be excavated and recorded in accordance with AOC Archaeology's standard practice (Appendix 7.9-7.11).
- 3.5 Where larger more significant discoveries are made (those requiring more than two hours to deal with) AOC Archaeology will immediately inform the client and HET, to describe the features, itemise the costs and propose a mitigation strategy if appropriate for their excavation. If the client and HET agree to these works a supplementary *Written Scheme of Investigation* will be prepared, and the arrangements confirmed by fax. All excavation works will be undertaken in accordance with AOC Archaeology's standard procedures (Appendix 9).
- 3.6 Should human remains be uncovered these will be treated in accordance with Scots Law, standard AOC Archaeology policy (Appendix 7.12), IFA standard practice and in keeping with Historic Scotland's policy for *The Treatment of Human Remains in Archaeology*. Any human remains which are encountered will initially be left *in situ*. Their removal will be a matter of discussion with the client and

- HET (who must be notified within 12 hours of their discovery). The Police will also be informed prior to the removal of any bone material.
- 3.7 All excavation must be undertaken with a view to avoiding damage to any archaeological features or deposits which appear to be worthy of preservation *in situ*. No archaeological deposits should be entirely removed unless this is unavoidable, in agreement with HET. Where possible, significant archaeological material will be preserved *in situ*. In the event that preservation *in situ* cannot be implemented, any resultant Data Structure Report, artefact or ecofact analysis (Post-Excavation) and publication (if appropriate) will be fully funded by the client in accordance with a negotiated mitigation strategy that will comply with the Conditions for Planning Consent. Archaeological remains to be preserved *in situ* will be covered by terram and these areas backfilled.
 - 3.8 Within one month of the completion of all fieldwork the results of the archaeological works will be presented in the form of a written report. This report will synthesise the results of the fieldwork and determine the significance and extent of any archaeological features identified.
 - 3.9 The watching brief report (paper & digital) will be in the form of a HET Basic Report prepared in accordance with HET reporting standards (revised February 2010) and AOC Archaeology standard procedures (Appendix 8, Section 8.1 to 8.8). Specifically the Basic Report will contain the following:
 - i) a full descriptive text detailing the features identified and an interpretation of their date and purpose;
 - ii) integrated summary of the results of the geophysical survey;
 - iii) geo-referenced plans at an appropriate scale showing the evaluated areas and features located;
 - iv) appropriate lists and diagrams summarising the contexts and artefacts recovered and the records made of them;
 - v) analysis of the results of the works, including appropriate post-excavation appraisals.
 - 3.10 Limited examination of artefacts will have been undertaken as an element of the report. However, should significant artefacts and samples be recovered there may be the need for further phases of work including post-excavation analyses of samples. A costed Post-Excavation Research Design would be prepared in these circumstances. The need for, and scale of, such further phases would be determined in consultation with the planning authority's archaeological advisor.
 - 3.11 The report will also include a definition of the archaeological significance and potential of the site. Proposals will be made as to the most appropriate course of action necessary to limit any possible negative impact upon those features through national planning guidelines and local planning decisions/priorities. Prior to completion of the report all issues will be discussed with the client
 - 3.12 A draft report will be submitted to the client prior to the finalised version for approval. Four hard copies of the final report and a digital copy will then be supplied to the client. In addition to a Summary Report on the works submitted to *Discovery and Excavation in Scotland* (DES) the project will also be entered into the on-line OASIS reporting facility. A digital (dxf) geo-referenced plan showing the boundaries of the area evaluated will be uploaded on the OASIS record.

- 3.13 A selection of photographs illustrative of the fieldwork and discoveries made together with the evaluation *Basic Report* (on CD) will be deposited with the HER.
- 3.14 The catalogued archive from these works will be prepared for deposition in the National Monuments Record of Scotland within 6 months of the completion of all fieldwork.
- 3.15 Finds of objects will be subject to the Scots Laws of Treasure Trove and Bona Vacantia and reported by the archaeological contractor to the Secretariat of the Treasure Trove Panel for disposal to an appropriate museum. This process is a standard AOC procedure.

4 OPERATIONAL FACTORS

4.1 Monitoring

- 4.1.1 AOC Archaeology will liaise with HET at all times to ensure they are aware of fieldwork dates and so be able to schedule in advance any monitoring visits. A mobile phone will be present on site at all times to allow easy contact. It is anticipated that the metal detecting survey and watching brief will be undertaken in November 2011.

4.2 Health & Safety

- 4.2.1 AOC Archaeology has always maintained high standards on-site and a copy of our Health & Safety Policy is available on request. The Watching Brief Officer will liaise with the Main Contractor before coming on-site to ensure that our element of the works are conducted in a manner that is safe for our staff, Main Contractor staff and members of the public. AOC staff will adhere to the health and safety induction of the Main Contractor. The AOC Watching Brief Officer will also carry out their own risk assessment.
- 4.2.2 Appropriate measures will be required for the handling of contaminated materials and the movement of plant and AOC Archaeology Group will rely on guidance for this from the Main Contractor.

4.3 Project Team

- 4.3.1 The metal detecting survey will be undertaken by Mr Rob Engl. The watching brief will be undertaken by either, Mr. Kevin Paton or Mr. Andrew Sibley. The project will be managed by Mr. Martin Cook, MIfA, Senior Project Officer. Quality assurance will be provided by Mr. John Gooder, Operations Director.

5 CONDITIONS AND CLARIFICATIONS

- 5.1 Where previous works have identified the presence of contaminated ground, AOC Archaeology must be notified of the nature and extent of the contamination and be given guidance to the appropriate health and safety precautions required. Where these precautions comprise more than the use of thin over-suits and nitrile gloves AOC Archaeology will provide the necessary equipment for an additional cost.

5.2 Where AOC is not the main contractor on a site the main contractor's Risk Assessment will have primacy over the AOC document given that:

- 1 The main contractors' risk assessment is aware of, and takes account of, AOC's working practices – i.e. it does not compromise normal and safe archaeological procedure as set out in our Written Scheme of Investigation and Risk Assessment;
- 2 AOC was notified of the full suite of hazards present prior to arriving on site;
- 3 There is a proper induction and monitoring process in place and AOC staff have been through this process;
- 4 There is no significant conflict between AOC H & S procedures and those proposed by the main contractor;
- 5 AOC are made aware of new threats or hazards as they arise during the course of our on-site involvement.

5.3 If the watching brief identifies significant archaeological remains there may be a requirement to undertake further works such as excavation, post-excavation and publication.

5.4 AOC Archaeology reserves the right to discuss the archaeological works directly with HET where appropriate, but will inform the client of this in advance

6 REFERENCES

Foard, G & Partida, T 2005, Scotland's Historic Fields of Conflict – An Assessment for Historic Scotland, The Battlefields Trust

Gregory, D 1975, History of the Western Highlands and Isles of Scotland: from AD 1493 to AD 1625 with a brief introductory sketch, from AD 80 to AD 1493, Edinburgh

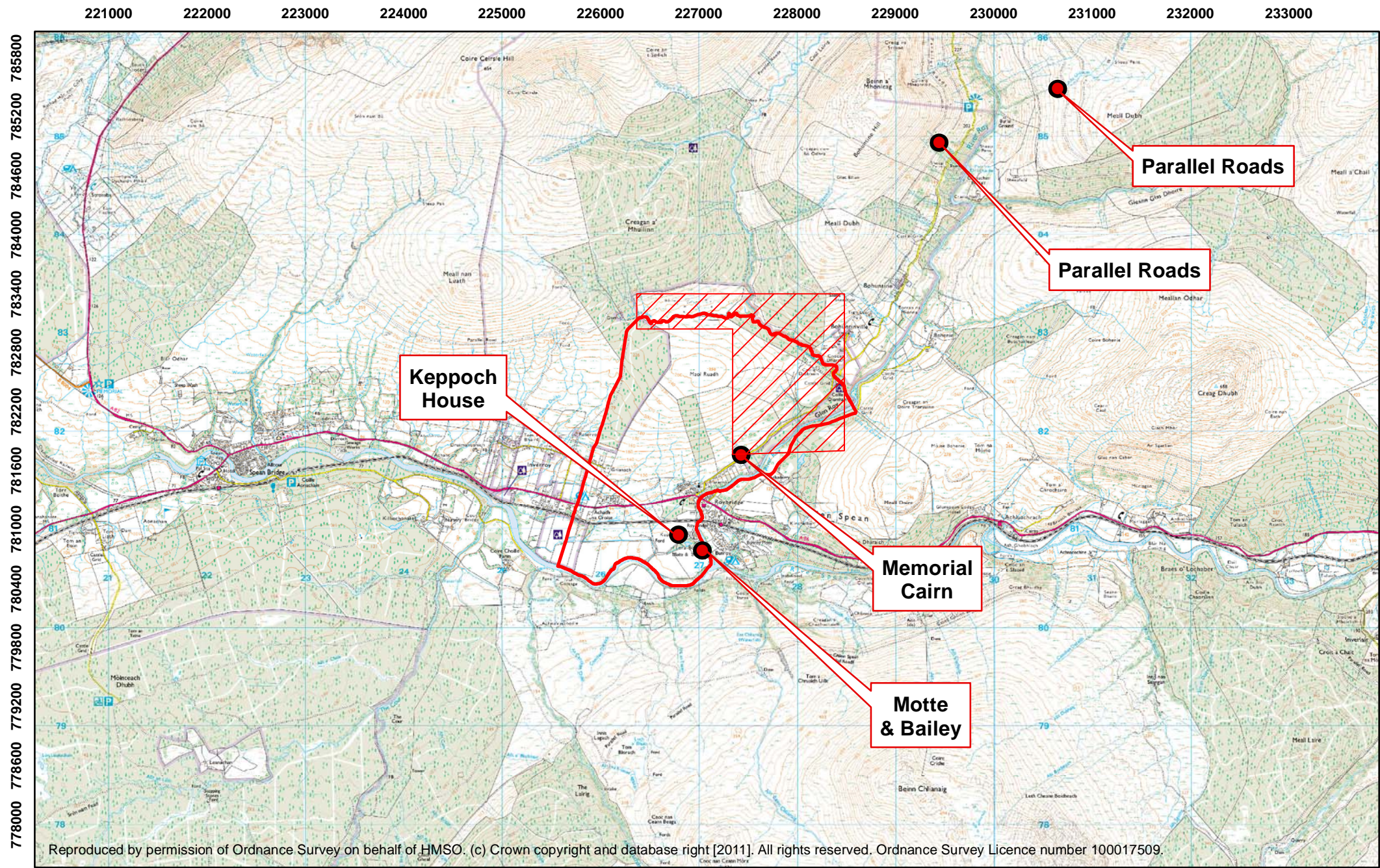
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Planning and Archaeology 2011, (Scottish Government 2011).

Scottish Government 2010 *Scottish Planning Policy*. (February 2010)

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Battlefields Inventory Boundary
 0 250 500 Metres
 Development Area

Figure 2: Battle of Mulroy Features, 4th August 1688

APPENDIX A: THE BATTLE OF MULROY (as reproduced from Historic Scotland's Inventory of Battlefields)

MULROY

4 August 1688

Local Authority: Highland

NGR centred: NN 270 819

Overview

The Battle of Mulroy is known as the last clan battle. It was fought between a force of Highlanders from the MacDonalds of Keppoch, along with allies including Camerons and Macmartins, against the army of Lachlan Mackintosh, with support from his Clan Chattan allies and several hundred Government infantry.

Despite Mackintosh's advantage of numbers, the Highlanders were able to defeat his force and even capture Lachlan himself. However, they were forced to release him when soldiers moved to attempt his rescue and over the coming months the MacDonalds would face a campaign of brutal reprisal, until the Government forces were recalled in the build up to the Glorious Revolution.

The Battle

When the invasion force gathered at the end of July 1688, Lachlan Mackintosh ordered the construction of a fort near Keppoch House, physically claiming the land that the law upheld as his. The Rivers Spean and Roy were running high and it was not possible to cross them (the accounts are vague as to whether the builders were trapped on the MacDonald side of the rivers). As the construction of the fort continued, Coll MacDonald's force gathered, shielded by the hills of Glen Roy. Captain Mackenzie of Suddie was dispatched from Inverness to aid Mackintosh

Mackintosh's force, commanded by Captain Mackenzie, had to wait until the first week of August before they had the opportunity to meet with their enemies. Upon crossing to the north of the Spean and to the west of the Roy, they found their enemies arrayed on good ground on the slope of Maol Ruadh. Historians such as Hopkins and Roberts estimate the battle to have taken place around 4 August, though William Mackintosh of Borlum reports that the fighting occurred on the morning of 7 August.

The night before the battle, Mackenzie's men were drawn up in battle array between the fort and the MacDonalds on the hill. During the night, the number of MacDonalds and their allies increased from around 200 to 600 or 700. The next morning the two forces met on the slope of Mual Ruadh. The MacDonalds and their allies, who were positioned on the high ground, executed a classic Highland charge down the slope towards the Mackintoshes. While some accounts describe the MacDonalds discharging one volley before charging forward to meet their foes with drawn swords and Lochaber axes, another quite detailed account describes a fire-fight last for up to an hour (MacBane). The fighting resulted in many casualties, including Mackenzie and several leading members of Clan Chattan, before the Mackintoshes were routed.

The regular troops of Mackenzie's force returned to their garrison at Inverness, carrying with them some of the wounded, including their commander, who later died. The MacDonalds captured Lachlan Mackintosh and his family, along with his possessions and supplies that had been moved to the old fort near Keppoch House. Mackintosh was forced into a written agreement regarding the tenancy of the

MacDonald lands, but the prisoners were hastily released before they could be rescued.

The Armies

The battle is often remembered as the last clan battle and this is reflected in the nature of the two opposing sides. The MacDonalds and their allies, which included the Camerons and the Macmartins were led by Coll MacDonald and their force built very much on traditional clan lines. The Chattan alliance, however, was supported by regular government troops based in Inverness under the command of Mackenzie of Suddie.

Numbers

Mackintosh: Mackintosh and his Clan Chattan allies were able to raise 400-500 men and were augmented by a government force to bring their total strength to approximately 1000 (Mackenzie 1688, Drummond 1842, Gregory 1881, Roberts 2000).

MacDonald: The MacDonalds of Keppoch mustered an estimated 200 men of their own clan, but were able to add 500 or so more men from the Camerons of Lochiel and the MacMartins of Letterfinlay (Mackenzie 1688, Gregory 1881, Roberts 2000).

Losses

Casualties were reportedly heavy, though no exact numbers are quoted.

Action

When the invasion force gathered at the end of July 1688, Lachlan Mackintosh ordered the construction of a fort near Keppoch House, physically claiming the land that the law upheld as his. In a letter to the Earl of Perth Mackintosh writes,

‘My freinds and I are here makeing up a little fort, in quhich we are to leave some men for secureing me in my possessione, this being the onely most probable meane for reducing the rebels, and hat it not been for this we had been at them ere now, besides that the spates are impassible, but how soone the waters fall we hope to make account of them’ (Mackintosh 1688: 352).

As Mackintosh reported, the Rivers Spean and Roy were running high and not able to be crossed. As the construction of the fort continued, Coll MacDonald's force gathered, shielded by the hills of Glen Roy. Captain Mackenzie of Suddie, dispatched to aid Mackintosh by the Privy Council, describes the tense waiting game in a letter to General Douglas, the commander of the King's army in Scotland:

‘Mey it pleas your Excellence, According to your ordor I joynd M^cIntoshie at this place Saturday last, in quhich tym wee have alwayes exterordinar rains. The first two or three dayes wee could see non off the rebels, bot now that the waters ar not passable for ther greatnes and ther being no bridges bot an off on tree bredth, ther appear about 200 off them on the other syd off the watter about half a myle from ws, and we have intelligence that ther ar presently the lyk number, iff not greater, not farr off hear; by this wee conjectur that ther freinds from all places to run to them, for all that trybe off the MacDonalds on Duck Gordons land and M^cIntoshes will not exceed 200 men’ (Mackenzie 1688: 299).

Mackintosh's force, commanded by Captain Mackenzie, had to wait until the first week of August before they had the opportunity to meet with their enemies. Upon crossing to the northern banks of the Spean and Roy, they found their enemies arrayed on good ground on the slope of Maol Ruadh. Historians such as Hopkins and Roberts estimate the battle to have taken place around 4 August, though William Mackintosh of Borlum reports that the fighting occurred on the morning of the 7

August. In a letter describing the battle to the Duke of Gordon, Borlum writes that events

‘drew to a full head upon Monday’s night, the 6th of August.... And C:McKenzie with his company, seconded with near 300 of Mackintoshe’s men drew up betwixt them and the ffort, and there all that night both parties stood in armes within a musket shot to one another, under cloud of which night the rebells incressed to the number of 6 or 700...’ (Mackenzie Papers, Manuscript 39200, folio 3).

The next morning the two forces met on the slope of Maol Ruadh. The MacDonalds and their allies, who had gained the high ground, executed a classic Highland charge down the slope towards the Mackintoshes. They fired one volley and charged forward to meet their foes with drawn swords and Lochaber axes. Fighting reportedly lasted an hour and resulted in many casualties, including Mackenzie and several leading members of Clan Chattan before the Mackintoshes were routed.

Secondary sources do not go into detail of the battle, merely citing the action as a classic Highland charge. According to Borlum, however, the MacDonalds first concentrated on the left of the Mackintosh force ‘to pass by us to Keppach [sic] and thr seise Mackintoshe, his Lady, and all our baggage, horses, and spoile at the old ffort in Keppach’ (Manuscript 39200, folio 3), but met resistance from Captain Mackenzie. The attempt then switched to the right of the Mackintosh force and was quickly followed by a full charge against the whole of the line, under the force of which Mackintosh resistance crumbled. Borlum describes the final mass charge:

‘[T]their whole body immediatly rushed furiously over a Stryp that rune betwixt them & us, (all naked except their shirts) and forced a detashd partie that stood in defence of that pass opposite to Mackintoshe his coulours, to retire hastily to their owne body, which our body perceiwing gave ground at first, and then immediatlly shamefully began to run disorderly towards the scounce (?) notwithstanding of all the strokes and threats of their officers to the contrary’ (Manuscript 39200, folio 3).

In his reminiscences, Donald McBane describes his experience as a young soldier in Mackenzie’s regulars from his position on the right of the Mackintosh line:

‘The two *Clans* was both on Foot, and our Company was still with *Mcintosh*, who Marched towards *MacDonald* and his *Clan*, untill we came in sight of them. Then both Parties ordered their Men to March up the Hill, a Company being in the Front, we drew up in a Line of Battle as we could, our Company being on the Right; we were no sooner in Order, but there Appears Double our Number of the *MacDonalds*, which made us then to fear the Worst, at least for my part, I repeated my former Wish (I never having seen the like) The *MacDonalds* came down the Hill upon us without either Shoe, Stocking, or Bonnet on their Head, they gave a shout, and then the Fire began on both sides, and continued a hot Dispute for an Hour; then they broke in upon us with their *Sword* and *Target*, and *Lochaber Axes*, which obliged us to give way, seeing my Captain sore wounded, and a great many more with Heads lying cloven on every side, I was sadly Affrighted, never having seen the like before, a *Highland-man* Attacked me with *Sword* and *Targe*, and cut my Wooden handled *Bayonet* out of the Muzel of my *Gun*; I then Clubed my *Gun* and gave him a stroak with it, which made the Butt-end to fly off; seeing the *Highland-men* come fast upon me, I took my Heels, and Run Thirty Miles, before I looked behind me, every Person I saw or met, I took him for my Enemy, at length I came to the Garrison of *Inverness*; what was left of our Company came up some time after; we remained there untill the next Year 88, when King *William* came over, and our Company was broke’ (MacBane 1728: 75-77).

The regular troops of Mackenzie’s force returned to their garrison at Inverness, carrying with them some of the wounded, including their commander (Hopkins 1986). The MacDonalds captured Lachlan Mackintosh and his family, along with his possessions and supplies that had been moved to the old fort at Keppoch House.

Mackintosh was forced him into a written agreement regarding the tenancy of the MacDonald lands, but the prisoners were hastily released when a force of either Macphersons or Grants arrived to save him (Hopkins 1986).

Aftermath and Consequences

The aftermath of the action on Maol Ruadh was one of violent reprisal against the victorious MacDonalds of Keppoch. The presence of royal troops, and their casualties necessarily involved the Privy Council, which wanted a garrison stationed in Lochaber to impose order. In response to Mulroy, the Privy Council sent 150 foot and 60 dragoons to raze the Keppoch lands and exterminate men, women and children. Despite these harsh orders, most of the inhabitants escaped to the hills, though houses, crops and food stores were destroyed. After a month of punishing the Keppoch MacDonalds, the government troops were quickly recalled as James VII's attention became focused on the anticipated invasion of William of Orange and the start of the Glorious Revolution.

The battle of Mulroy illustrates the importance of ground in Highland battles and how the successful combination of advantageous terrain and the momentum of the Highland charge could be used to great effect. Precisely the same tactic used by the Keppoch MacDonalds was repeated a year later, again to resounding victory by the Jacobite army of John Graham of Claverhouse, Viscount Dundee at the battle of Killiecrankie.

Mulroy is remembered as the last of the clan battles. Soon after Mulroy the Glorious Revolution and the installation of William and Mary on the British throne resulted in a consolidation of government control and the stationing of regular government troops in the Highlands. Mulroy occurred at a point when traditional clan rule became incorporated into more centralised authority.

Events & Participants

Late-seventeenth-century Scotland was fraught with political upheaval and civil unrest. The political turmoil of the Civil Wars of the 1640s was followed by decades of religious tension. Friction between Catholics and Protestants, as well as Episcopal and dissenting Protestants, was exacerbated by the policies of Charles II when he was restored to the throne in 1660. Upon the death of Charles in 1685, his younger brother became James VII and II. James' succession was immediately contested by Charles II's illegitimate son, the Duke of Monmouth, supported in Scotland by Archibald Campbell, Duke of Argyll. Argyll's invasion of Scotland crumbled and he was captured near Paisley and beheaded in Edinburgh in June 1685. After the collapse of Argyll's rebellion, James's government failed to establish order in the Scottish Highlands. Government troops looted the lands of Presbyterian landowners, such as Argyll and his clansmen. The previous policies of government cooperation with clan chiefs were largely abandoned. Instead, Lowland regiments of regular troops were sent into the Highlands to recruit independent companies, which strained relations with clan elites even further.

As the Battle of Mulroy was a clan battle, albeit with national resonance, it is perhaps unsurprising that none of the participants was of national importance. However, the main opponents were important figures within the Highlands, with Coll MacDonald, a former university student, perhaps representing a more forward looking generation than his foe Lachalan Mackintosh. Ironically the best known figure was not a clan chief but a private soldier; Donald MacBane, who served in Suddie's regiment, was on the receiving end of successful Highland charges here and at Killiecrankie in

1689, and he wrote about his experiences in these battles in his memoirs. Most famously he is the soldier who claims to have jumped across the River Garry in the aftermath of the Battle of Killiecrankie, at the place today known as Soldier's Leap.

The battle is also notable for the presence of Lady Mackintosh, who was taken prisoner by the MacDonald's. It was not unusual for armies to have women travelling with them on campaign but it is unusual for them to be recorded by name.

Context

Late-seventeenth-century Scotland was fraught with political upheaval and civil unrest. The political turmoil of the Civil Wars of the 1640s was followed by decades of religious tension. Friction between Catholics and Protestants as well as Episcopal and dissenting Protestants was exacerbated by the policies of Charles II when he was restored to the throne in 1660. Upon the death of Charles in 1685, his younger brother became James VII. In England, James's succession was immediately contested by Charles II's illegitimate son, the Duke of Monmouth. Monmouth launched a rebellion, gaining the support of Scottish Protestants, such as Archibald Campbell, Duke of Argyll. Argyll led an invasion of Scotland by a force of Scottish Protestant exiles from the Netherlands, but Argyll was unable to raise sufficient support for the rebellion among his clan connections. With the weight of the government mobilised against him, Argyll's movement crumbled and he was captured near Paisley and beheaded in Edinburgh in June 1685.

After the collapse of Argyll's rebellion, James's government failed to establish order in the Scottish Highlands. Government troops looted the lands of Presbyterian landowners, such as Argyll and his clansmen. The previous policies of government cooperation with clan chiefs were largely abandoned. Instead, Lowland regiments of regular troops were sent into the Highlands to recruit independent companies, which strained relations with clan elites even further. Early in 1688 the crown renewed commissions of fire and sword. These commissions granted local nobility and gentry the power to punish crimes in the Highlands, where the government's authority was not able to reach. Such commissions were vulnerable to abuse and were often used in on-going power struggles between clans. In 1681, one such commission was issued to Lachlan Mackintosh of Torcastle to punish Coll MacDonald and the MacDonalds of Keppoch, who lived on Mackintosh's land but refused to acknowledge Mackintosh as their feudal overlord and pay the required rent. The following year Mackintosh invaded the lands of Keppoch and constructed a fort near Keppoch House, though the fort was subsequently dismantled by Coll MacDonald. In 1688, with the renewal of commissions, Mackintosh again attempted to assert authority over the MacDonalds, this time securing government support. A force stationed at Inverness under the command of Captain Kenneth Mackenzie of Suddie was dispatched to join Mackintosh. In July of 1688 1000 men gathered for a second invasion of Keppoch territory and the following month they crossed Glen Roy to find a 700-strong force led by Coll MacDonald and his clan along with his allies the Camerons of Lochiel and Macmartins of Letterfinlay arrayed against them.

The battle that ensued on the slope of Maol Ruadh (anglicised as 'Mulroy') became known as the last clan battle. Though government troops were involved, the fight was essentially a localised, private power struggle between clans. It was the result of deeply-entrenched, on-going clan tensions exacerbated by decades of political upheaval and lack of centralised authority in the Highlands. The battle of Mulroy immediately preceded the Glorious Revolution, highlighting King James' tenuous political authority and inability to maintain order in Scotland. Just months later William of Orange arrived in Britain and was crowned monarch, along with his wife Mary, in the following spring.

Other Notable Participants

The MacDonalds were led by Coll MacDonald, fifteenth Chief of Keppoch. He had been Chief since the death of his father Archibald in 1682 and inherited from him the dispute of land and tenancy which had first caused Lachlan Mackintosh to successfully press the Privy Council for commission of fire and sword in 1681. Coll was studying at the University of St Andrews at the time of his succession, a clear indication that the upper strata of the highland clans were not the uncultivated mountain men which Lowlanders generally regarded them to be. Initially, he sought to resolve the situation through negotiation but when this failed, and indeed led to him spending some time in jail, he was equally capable of demonstrating that there was also warrior's blood flowing through his scholar's veins.

In 1688, Mackintosh had the commission of fire and sword renewed but this time it came with the added value of assistance provided by royal troops based in Inverness. These men were under the command of Captain Kenneth Mackenzie of Suddie, who was mortally wounded during the battle, dying on his return to Inverness. Lachlan Mackintosh was also taken, along with his wife and family whom he had brought with him, but was released very soon after, perhaps in anticipation of the reprisals which were inevitable given the defeat delivered against government troops.

The best known participant in the battle was not a commander or a clan chief but a private soldier in Suddie's regiment. Donald MacBane was to immortalise his exploits at Mulroy and later at Killiecrankie (July 1689) in his memoirs, and in doing so provide one of the most detailed accounts of the battle at Mulroy (his mention of an hour long fire-fight is interesting as it is flies in the face of traditional models of clan warfare which would have a single volley fired before muskets were thrown down and swords drawn). He ran away from both battles and if his entertaining writings are to be believed he leapt from one side of the river to the other at Killiecrankie at the place now remembered as Soldier's Leap. He would go on to run a brothel and become an instructor in fencing (also publishing a manual of swordsmanship) and on his death was buried in the garrison cemetery in Fort William.

Physical Remains & Potential

Despite the small scale of the engagement, it is probable that archaeological evidence remains. Hand-to-hand fighting in a defined battlefield area would result in the deposition of a variety of physical remains. Spent and dropped ammunition, damaged weapons and personal accoutrements like buckles and buttons would have been lost or abandoned during the action and subsequent flight. The recovery of large amounts of musket balls would add credence to MacBane's account of an hour-long fire-fight.

Other physical remains include the abandoned fort foundations. The nineteenth century manuscript of Rev. Mackintosh Mackay claimed that the foundations of the fort were still visible on the ground. Site inspection suggests that the fort was built on top of the bailey of an existing motte and bailey castle, located to the south-east of Keppoch House, on the western bank of the River Roy and known locally as Keppoch Castle. Today, a distinct and possibly secondary bank can be seen running around the lip of the motte, with some suggestion of small rectangular structures within.

Physical Remains

Physical remains on the site include the abandoned fort foundations. A site visit carried out in support of this report may have shed important new light on the location of the fort. Some 250 m to the south-east of the present Keppoch House (c. 1760s, the original was burned to the ground during the 1745 Jacobite Rising), are the remains of what appears to be a motte and bailey castle (NN 2705 8077), which is known locally as Keppoch Castle (NN28SE 2). There is however some disagreement as to whether this feature, which is built into a natural gravel spur on the west bank of the River Roy is a medieval castle or a fortification first built by the 6th chief of MacDonell of Keppoch in the early sixteenth century. Whatever the case, it seems likely that this impressive feature provided the basis for the fort which Mackintosh attempted to build on the site. The outer rim of the bailey has what might be a later bank running around it and there is some suggestion of square/rectangular earthen structures within.

A rigorous reinterpretation of the battle using archaeological survey techniques, such as topographical and metal detector survey, would illustrate the details of the battle that are not found in written source material.

Cultural Association

Given its clan character it is not surprising to find Mulroy remembered in number of songs, poems and tunes. The pibrochs called *Latha na Maoile Ruadh* (the Day of Mulroy, also known as Isabella Mackay) and *Blar na Maoile Ruaidh* (the Battle of Mulroy) were composed in celebration of the MacDonald victory. There is also a more modern reel called the Battle of Mulroy and a Gaelic song titled *Thàinig sgeul o'n àrmailt*.

Commemoration & Interpretation

A small cairn stands as a monument to the battle, alongside the road which runs along the southern slopes of Mulroy, 1 km to the north of Roybridge, though this was only erected in recent years.

Given its clan-based participants it is no surprise that the battle is commemorated in a number of poems, songs and pieces of music.

The Rev. Mackay collection in the National Library of Scotland (NLS MS 874 fos.325 39: Rev. Mackintosh Mackay, from oral tradition) includes a number of poems and songs directly or indirectly related to the battle. The following is an extract from a Gaelic song in the collection called 'The Battle of Mulroy':

As a quarter of a mile; Ye did not offer to
flee From the company of sure whistling
(guns) Till they drowned your breast; That
was the company that destroyed you.

By the King! sharp-set were the men, Who
were on the hill to which they retreated, They
were obliged to bend, When they could not
stand; Though thy own partisans cried aloud
In the late approach (belly) of evening, They
were scattered like small cattle, Those of
heaping the peeks. (rent-lifters)

Many a frizzle-haired Mackintosh, Is
 in this country with their theft,
 Between the Lamp meadows of May.
 And the borders of Lochaber, Who is¹
 ascending the ladder, Paying rent to
 the bolts and bars.

By the King! satisfactory was the day,
 Ye brought out a good hunting-match,
 Upon men of porridge and brose;
 Their marches, men not successful,
 Many a spade and shovel, In an evil
 hour was in they army, That was now
 going to dig graves, Beneath the
 banks, for thy friends.

Battlefield Landscape

The description of the location of Mackenzie's men between the fort and the MacDonalds on the high ground of Maol Ruadh, or Mulroy would place the fighting on the southern, lower slopes of the hill. The slope of Maol Ruadh has not been developed, although a recently cleared strip of tree plantation may coincide with part of the initial MacDonald deployment, with the fighting perhaps taking place on the lower slopes below this. The village of Mulroy may have impinged on some areas of activity, which might include Mackenzies initial position on the night before the battle but the prospects for the fighting itself to have taken place on the slopes above are good as the accounts suggest Mackenzie advanced towards the MacDonalds prior to battle being closed.

Remains relating to what appears to be the fort which was twice slighted can be seen on the lip of the bailey associated with the motte and bailey castle mounds located around 250m to the south-east of Keppoch House.

Location

The battle took place on the southern slope of Maol Ruadh near the village of Roybridge in the district of Lochaber. Historians, primary sources and map sources, such as the First Edition and subsequent Ordnance Survey maps, place the battle location firmly on Maol Ruadh, but do not record the position of Mackintosh's aborted fort.

The original fort of 1681 is reportedly located at the site of Keppoch House and it is there that Borlum locates the capture of Mackintosh, his family, and his goods. Historians (Roberts 2000, Hopkins 1986, Gregory 1881), however, are vague as to the line of approach of the force commanded by Mackenzie. They variously cite that the Mackintoshes were separated from the MacDonalds by the high waters of the Spean, where as others state that they were separated by the Roy (MacLean 1939; Mackay n.d.). According to the oral traditions recorded by Rev. Mackintosh Mackay, Mackintosh's force gathered 'on a site pitched upon by Mackintosh, on a precipitous bank of the river Roy, about a musket shot south of the spot where a bridge now crosses that stream, and where the walls, to the height of a few feet are yet to be seen' (Mackay n.d.: 327). As the construction of the new fort progressed, the

Two lines omitted, viz.
 "Who would sit as stately,
 As a place-man of the
 Abbey."

MacDonalds and their allies gathered 'in a narrow glen, behind the ridge of hills that rises to the north-east of Keppoch, and the sloping declivity and heights of which, towards Keppoch, are called *Maolroy*.' (ibid. 327) Mackay further describes the route of the Mackintoshes after the battle as passing 'very near where the Bridge of Roy now stands' (ibid. 329) and fleeing up Glen Roy 'so well known now as the site of the parallel roads' (ibid. 330). The parallel roads are the lines of ancient lake shore created when a retreating glacier dammed the glen. They run on both sides of the River Roy at the height of 260 m, 325 m and 350 m.

Terrain

The battle took place amidst the rugged hills of Glen Roy near the confluence of the Spean and Roy rivers. The battle itself took place on the sloping ground of the southern side of Maol Ruadh. The terrain and rivers complicated the engagement. The sloping ground was well-suited to the tactics of a Highland charge, while the rough ground and rivers limited the approaches and routes of flight to and from the battlefield.

Condition

The slope of Maol Ruadh has not been developed, however a patch of plantation, recently felled, covers part of the slope, potentially obscuring part of the battle site.

Development has been limited to the immediate area of Roybridge at the base of the hill and does not encroach upon the slopes of Maol Ruadh itself, where the battle took place. The survival of the unfinished fort, however, has probably been impacted by the growth of the communities of Roybridge and Bunroy. Roy's Military Map of 1747-55 shows small-scale agricultural development on the northern bank of the Roy with a smattering of farm buildings and ploughed fields. Likewise there is cultivation along the northern bank of the Spean, including the grounds of Keppoch House.

By the first edition of the Ordnance Survey, the farmsteads to the north of the River Roy have gone out of use. Maol Ruadh is labelled as 'Site of Battle between Clans'.

At the time of the first revision of the Ordnance Survey map in 1902-3, the community of Roybridge had grown with the addition of buildings at the confluence of the Roy and Spean, as well as along the river banks. There is also the addition of the West Highland Railway line.

Today the community of Roybridge extends to the foot of Maol Ruadh, bounded by a road that runs north along the course of the River Roy. There is a patch of forest plantation that covers a swathe of the battlefield area, which would compromise the archaeological evidence. Curiously, the current OS map no longer records the existence of the clan battle.

Inventory Boundary

The Inventory boundary defines the area in which the main events of the battle are considered to have taken place (landscape context) and where associated physical remains and archaeological evidence occur or may be expected (specific qualities). The landscape context is described under *battlefield landscape*: it encompasses areas of fighting, key movements of troops across the landscape and other important locations, such the position of camps or vantage points. Although the landscape has changed since the time of the battle, key characteristics of the terrain at the time of the battle can still be identified, enabling events to be more fully understood and interpreted in their landscape context. Specific qualities are described under *physical remains and potential*: these include landscape features that played a significant role in the battle, other physical remains, such as enclosures or built structures, and areas of known or potential archaeological evidence.

The Inventory boundary for the Battle of Mulroy is defined on the accompanying map and includes the following areas:

- The summit of Mulroy, on the southern slopes of which the battle took place. The MacDonalds may have approached their final position from the northern side of the hill, taking them close to the summit on their approach.
- The lower southern slope of Mulroy, including that part of the village of Roybridge to the west of the bridge. This area may have included the location of Mackenzie's original position, the night before the battle.
- The flood plain of the Rivers Roy and Spean on which the fort is probably located, on the Motte and Bailey castle built on a natural gravel terrace on the western bank of the Roy. Keppoch House is located on a higher terrace, though the location of the original house, present in 1688 and razed during the 1745 Jacobite Rebellion, may have been in a slightly different location (the present house was built in 1760s).

Select Bibliography

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Further Bibliography

Information on Sources and Publications

The battle of Mulroy is well documented in both primary and secondary sources, though no rigorous modern assessment of the battlefield has been attempted. The background to the conflict is well illustrated with legal documents relating to the quarrel of tenancy between Mackintosh and the MacDonalds of Keppoch. These include Mackintosh's original writ of fire and sword as well as the reinstated commission of 1688, petitions by Coll MacDonald, records of the involvement of the Privy Council, etc. As to reports of the battle action, there are letters written by those involved, such as Lachlan Mackintosh and Captain Mackenzie. These particularly deal with the events immediately prior to the battle. Gaelic poems and ballads were written about the engagement, passed on through oral tradition and transcribed by later antiquarians and scholars. These, however, have been embellished with details and speeches of dubious veracity (ie Reverend Mackintosh Mackay's account in the National Library Scotland, MS 874 fos.325-39).

Primary Sources

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15th November 1688. Bond by Ronald M'Donald of Ferset. Register of the Privy Council of Scotland, third series, vol. XIII (1686-1689), p. 354.

19th November 1688. Bond by John Cameron of Glen Nevis and others for keeping the peace. Register of the Privy Council of Scotland.

Act annulling the commission of the Earl of Moray to hold courts in Lochaber, as the said commission prejudices the hereditary stewardship of Lachlan M'Intosh of Torcastle. Register of the Privy Council of Scotland, third series, vol. III (1669-1672), p. 403

Appointment of a commission to execute letters of fire and sword against certain of the name M'Donald. Register of the Privy Council of Scotland, third series, vol. VII (1681-1682), pp. 191-2 [a similar act in much the same wording appears, pp. 194-96.]

Breadalbane Collection, GD 112/1/612. Bond by Ronald MacDonald of Fersatt and Donald MacDonald in Inverey, uncle of said Ronald, as cautioners for Alexander and John MacDonald, brothers of said Ronald, tacksmen of 3 merkland of Drumleard

Breadalbane Muniments, GD 112/39/144/2, Carwhin to Breadalbane, 18 Aug. 1688 [Former Ref: GD 112/40/3/56-7]. Langwell's bargain; Ardchattan's affair; conflict with McIntosh is great news at present; proposal for a garrison in Lochaber; despatch of troops under command of Captain Straitown for reducing the rebels; sends a bottle of ink.

Breadalbane Muniments, GD 112/39/144/3, James, 4th earl of Perth, Edinburgh, to Breadalbane, 22 Sep. 1688.

Breadalbane Collection, GD 112/39/146/5. Petitions recipient to remember what passed at their meeting, since he is now going to London; wishes advice and protection; is content to receive his capitulation and submit to the present government. Dated 8 Sep 1689.[Former Ref: GD112/39/1209]

Breadalbane Muniments, GD 112/39/155/10, Breadalbane, Glenurchy, to Carwhin, 14 Nov. 1691.

Campbell of Barcaldine, GD 170/629/10, Breadalbane to Barcaldine, 24 Aug. 1688.

Campbell of Barcaldine, GD 170/670, Coll Macdonell of Keppoch, Dated at Keppoch 1692, January 17.

Campbell of Barcaldine, GD 170/3327, Attestation that Coll MacDonald of Keppoch has sworn allegiance to King William and Queen Mary, dated 13 Dec., 1691.

Drummond (of Balhaldie), John, *Memoirs of Sir Ewen Cameron of Lochell, Chief of the Clan Cameron*, ed, ed. J. MacKnight (Edinburgh: Abottsford Club, 1842), 229-31

Fraser-Mackintosh Collection, GD 128/21/1. Recommendation by Privy Council to General Douglas to reinforce Capt. Suddie's company lately "affronted" by MacDonalds in Braes of Lochaber, while "assisting" Macintosh, 9 August 1688.

Hume of Polwarth Earls of Marchmont, GD 158/1063/3. Duncan Forbes of Culloden to Marchmont, 14 August 1694.

Hume of Polwarth Earls of Marchmont, GD 158/1104/2, Mackintosh of Torcastle to Marchmont, 7 Jan. 1697. Invernes. On his criminal libel against Coll MacDonald, and 'those rebellious and most vicked crew of the Brea Lochaber men', anent murder of Captain Mackenzie of Suddie; wishes a commission of fire and sword.

Jacobite Papers and Letters, 'Information of the grounds of differences betwixt...Macintosh and Keppoch', MS 295, ff. 1-2

- Mackay, M. MS 874 fos.325-39: Rev. Mackintosh Mackay, from oral tradition.
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- Mackintosh Muniments, GD 176/582. Letter from Archibald, 9th Earl of Argyll, to Lachlan Mackintosh [McIntosh] of Torcastle, dated at Glenurchy [Glenorchy], 30th May 1679.
- Mackintosh Muniments, GD 176/593. Petition by Lachlan Mackintosh [McIntosh] of Torcastle to the Lord High Commissioner and Estates of Parliament to be put in possession of his lands of the Brae of Lochaber and office of Steward thereof; and for a Commission of fire and sword against the MacDonalds [MacDonalds] there; dated on the back, 1680.
- Mackintosh Muniments, GD 176/603. Letter from Lachlan M'Intosh [McIntosh], dated at Contulich [Contullich], 3d September 1682, to his nephew, William M'Intosh [McIntosh] of Torcastle.
- Mackintosh Muniments, GD 176/606. Articles of Agreement between the Marquis of Huntly and the Laird of Mackintosh [McIntosh] at Inverness, 23d February 1683.
- Mackintosh Muniments, GD 176/615. Two Petitions by Lachlan M'Intosh [McIntosh] of Torcastle to the Privy Council, in 1685.
- Mackintosh Muniments GD 176/624. Three Acts by the Privy Council of Scotland following supplications by Lachlan Mackintosh of Torcastle (1) to put in force the commission of fire and sword by them on 20th September 1681. 8th August 1688.
- Mackintosh Muniments, GD 176/629 [UFP]. Letter from Viscount Dundee to the Laird of Mackintosh [McIntosh], urging him to take a stand for the King.
- Mackintosh Muniments, GD 176/656. Petition by Lachlan Mackintosh [McIntosh] of Torcastle against the intended release of Coll MacDonald [MacDonald], son of the deceased Archibald MacDonald [MacDonald] "my tenent" in Keppoch, c. 1700.
- Mackintosh Muniments, GD 176/641 [UFP]. Paper of Information and Advice as to the sale of Lochaber, dated February 1693.
- Mackintosh Muniments, GD 176/659. Commission by Lachlan M'Intosh [McIntosh] of Torcastle, narrating that a license has been granted to him by the Lords of Privy Council to treat with Coll M'Donald [MacDonald].
- Mackintosh Muniments, GD 176/668. Agreement between the friends of the Laird of Mackintoshe [McIntosh] on the one part, and Coll Mackdonald [MacDonald] of Keppoch with Sir Donald Mackdonald [MacDonald] of Slait [Sleat] as his cautioner on the other part, made in presence of Brigadier Maitland, governor of Fort William, at Fort William on 22d May 1700.
- MacPherson of Cluny Papers, GD 80/168, Copy Letters directed to the Lyon King-at-arms for summoning Coll MacDonald of Keppoch, Martin Mcmartine, elder of Letterfindlay, Duncan Mcphersone of Cluny, Lachlan McIntosh of Strowan, etc., to appear before the Privy Council on 11 Dec 1684.
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Papers of Society of Antiquaries of Scotland, GD 103/2/316. (Part of) Agreement between John Ferqwharsone of Innercald, William McIntoshe, elder, of Borlum, and others, as trustees for Lachlan McIntoshe, elder, of Torcastle, and Coll MacDonald, son of deceased Archibald MacDonald of Keppoch, as to the lands of Braelochaber.

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PC 1/50, f. 219. Protectiones Cameron of Locheill and MacDonald of Keppoch.

PC 1/51 (Acta Sep 1696-Jul 1699), Recomendatione to the Lord Advocat to draw two acts fore McIntosh. Act Renewing McKintoshes Commission of Fire & Sword against Coll MacDonald & others. Commission – the Laird of McIntosh against MacDonalds & others. Coppie Letters of Councurrence & Intercommuning the Laird of M^cIntosh against MacDonalds. Letter from Keppoch to the Vicount Tarbat. Warrant to Brigadier Maitland to allow men to the Laird of M^cIntosh for maintaining his possession against Keppoch.

APPENDIX 1

Desk-top assessment

The sources consulted as part of the desk-top study will depend on the type and level of data required and the material that is available to provide that information. Sources used may include, where available, all or some of the following listed below:

- i)* Walkover survey (Appendix 5).
- ii)* The relevant Local Sites and Monuments Record(s) and the National Monuments Record.
- iii)* British Geological Survey maps.
- iv)* Ordnance Survey maps of the site and its locality.
- v)* Tithe, Apportionment and Parish maps.
- vi)* Historic (pre-Ordnance Survey) and Estate maps of the area.
- vii)* Appropriate archaeological and historical journals and books.
- viii)* Historical documents held in local museums, libraries, record offices and other archives. This may be a selective survey given the scope of potential historic documentation for some sites.
- ix)* Unpublished material held by local professional and amateur archaeological organisations and museums.
- x)* Aerial photographs held by local authorities, Sites and Monuments Record, the National Library of Aerial Photographs, Cambridge University Collection of Aerial Photographs and other local parties.
- xi)* Scheduled Ancient Monuments Lists; listed building lists; registers of parks and gardens and battlefields; any local authority constraint designations (eg conservation Areas).
- xii)* All available borehole, trial pit and geotechnical data from the site and its immediate environs.
- xiii)* Plans of services locations held by statutory undertakers.
- xiv)* Fire insurance maps.
- xv)* Old and New Statistical Accounts (in Scotland).
- xvi)* Building Control Records.
- xvii)* Standing Building Assessment (Appendix 10).

APPENDIX 2

Geophysical survey

- 2.1 All geophysical survey work will be sub-contracted to an appropriate professional organisation but directly managed by AOC Archaeology.
- 2.2 Selection of techniques will be made in consultation with the survey organisation taking into account land use, geology, complicating factors (eg metal pipes and fences), known and/or suspected archaeology.
- 2.3 The report will contain background information on the site (as above) and a description of any anomalies located. An interpretation of the anomalies will also be given.
- 2.4 At least one plot of the data will be included, normally of dot density or grey scale type. Any enhancement of the image will be explicitly stated and the likely affect of the processing described.
- 2.5 Clear interpretative plans will be provided in a form that a non-technical reader can understand.
- 2.6 Plots and interpretative diagrams will be reproduced at a scale from which exact measurements can be taken. These will normally be 1:1000 for detailed survey and 1:2500 for other plans.
- 2.7 The basic computerised data will form part of the site archive.

APPENDIX 3

Surface collection survey (fieldwalking)

- 3.1 This type of survey will only be carried out in suitable ground visibility conditions. This effectively restricts the technique to arable land which has been ploughed, harrowed and left to weather for several weeks in autumn to early spring.
- 3.2 The collection grid will align with the Ordnance Survey grid unless surveying for a linear scheme when the transects will be parallel to the centre of the scheme. The grid will be established using measured survey techniques.
- 3.3 The spacing of transects and length of collection units will be as specified in the main part of the Written Scheme of Investigation. Each transect will be 2m wide. Collection units will be logged using a numeric 12 figure National Grid Reference which will identify the southern end of the unit.
- 3.4 Transects will be measured cumulatively on the ground using fixed-length strings to avoid variation in individual pace. Sighting poles will be placed at opposite ends of the land parcel to mark transects.
- 3.5 All material considered to be man-made or not local to the area will be collected and recorded by the individual collection unit. The exception to this is where dense concentrations of building material are present when a representative sample is retained per collection unit.
- 3.6 Stone scatters, areas of soil discolouration and outcrops of natural substrata will be recorded and plotted by stint.
- 3.7 Pro-forma sheets will be used to record details of walker, soil/crop conditions, slope/topography, and lighting/weather conditions for each transect and presence/absence of finds for each collection unit.
- 3.8 Finds will be washed and sorted into groups in order to facilitate identification. Finds will be bagged according to artefact class within each collection unit.
- 3.9 Finds will be identified, quantified and recorded directly on to computer. The results will be plotted using a CAD graphics programme.
- 3.10 All significant artefact distributions will be plotted by field, group of fields or appropriate length for a linear scheme, at 1:2500, with separate plans for each period or relevant subdivision, indicating the numbers of artefacts per stint.
- 3.11 The pottery and other relevant artefacts will be scanned to assess the date range of the assemblage.
- 3.12 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum or other body. These will be cleaned, conserved, bagged and boxed in accordance with the guidelines set out in UKIC's "*Conservation Guidelines No 2*".

APPENDIX 4

Earthwork surveys

- 4.1 Base points will be established using a Total Station.
- 4.2 Hachured plans will normally be prepared at 1:1250 or 1:2500 for most classes of earthwork. In certain cases more detailed survey by contouring will be carried out.
- 4.3 Appropriately experienced personnel will undertake the survey work.
- 4.4 All prepared plans will be presented with an accompanying descriptive text.

APPENDIX 5

Walkover Survey

- 5.1 The proposed study area will be walked over in a systematic manner. Approximately 30m wide transects will be used, although this can be reduced where conditions demand.
- 5.2 All features identified (including modern features) will be given a unique number. The location of each feature will be marked on a 1:10,000 map. A photographic and written record will be compiled.

APPENDIX 6

Test pits

- 6.1 Spacing and size of test pits will vary according to local topography, geology, and known or potential archaeology. Spacing and size will be as specified in the Written Scheme of Investigation.
- 6.2 Test pits will be laid out in relation to the Ordnance Survey national grid.
- 6.3 The most appropriate tools will be used taking into account the prevailing conditions at the time of the work.
- 6.4 A specified volume of topsoil from each test pit will be sieved through a 10mm mesh.
- 6.5 Conditions, contexts and artefact totals will be recorded on pro-forma sheets.
- 6.6 Subdivisions within the excavated material will be based on soil stratigraphy and spits of 100mm within each stratigraphical unit.
- 6.7 All artefact totals will be recorded by class.
- 6.8 Finds will be washed and sorted into groups in order to facilitate identification. Finds will be bagged according to artefact class within each collection unit.
- 6.9 Finds will be identified, quantified and recorded directly onto computer where appropriate. The results will be plotted using a CAD graphics programme when appropriate.
- 6.10 All significant artefact distributions will be plotted by field, group of fields or appropriate length for a linear scheme at 1:2500, with separate plans for each period or relevant subdivision, indicating the numbers of artefacts per test pit.
- 6.11 The pottery and other relevant artefacts will be scanned to assess the date range of the assemblage.
- 6.12 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum or other body. These will be cleaned, conserved, bagged and boxed in accordance with the guidelines set out in UKIC's "*Conservation Guidelines No 2*".

APPENDIX 7

Machine excavated trenches

Excavation

- 7.1 The entire site will be visually inspected before the commencement of any machine excavation. This will include the examination of any available exposures (eg recently cut ditches and geo-technical test pits).
- 7.2 Normally trench positions will be accurately surveyed prior to excavation and related to the National Grid. It may be necessary to survey the positions after excavation in some instances.
- 7.3 All machining will be carried out by plant of an appropriate size. Normally, this will be a JCB 3CX (or similar) or 360° tracked excavator with a 1.4 or 1.8m wide toothless bucket. Where access or working space is restricted a mini excavator such as a Kubota KH 90 will be used.
- 7.4 All machining will be carried out under direct control of an experienced archaeologist.
- 7.5 Undifferentiated topsoil or overburden of recent origin will be removed in successive level spits (approximately <0.5m) down to the first significant archaeological horizon.

- 7.6 Excavated material will be examined in order to retrieve artefacts to assist in the analysis of the spatial distribution of artefacts.
- 7.7 On completion of machine excavation, all faces of the trench that require examination or recording will be cleaned using appropriate hand tools.
- 7.8 All investigation of archaeological horizons will be by hand, with cleaning, inspection, and recording both in plan and section.
- 7.9 Within each significant archaeological horizon a minimum number of features required to meet the aims of the project will be hand excavated. Pits and postholes normally will be sampled by half-sectioning although some features may require complete excavation. Linear features will be sectioned as appropriate. Features not suited to excavation within the confines of narrow trenches will not be sampled. No deposits will be entirely removed unless this is unavoidable. As the objective is to define remains it will not necessarily be the intention to fully excavated all trenches to natural stratigraphy. However, the full depth of archaeological deposits across the entire site will be assessed. Even in the case where no remains have been located the stratigraphy of all evaluation trenches will be recorded.
- 7.10 Any excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features or deposits which appear to be demonstrably worthy of preservation *in situ*.
- 7.11 For palaeoenvironmental research different sampling strategies will be employed according to established research targets and the perceived importance of the strata under investigation. AOC Archaeology conventionally recovers three main categories of sample;
- i) Routine Soil Samples; a representative 500g sample from every excavated soil context on site. This sample is used in the characterisation of the sediment, potentially through pollen analysis, particle size analysis, pH analysis, phosphate analysis and loss-on-ignition;
 - ii) Standard Bulk Samples; a representative 10 litre sample from every excavated soil context on site. This sample is used, through floatation sieving, to recover a sub-sample of charred macroplant material, faunal remains and artefacts;
 - iii) Purposive or Special Samples; a sample from a sediment which is determined, in field, to either have the potential for dating (wood charcoal for radiocarbon dating or *in situ* hearths for magnetic susceptibility dating) or for the recovery of enhanced palaeoenvironmental information (waterlogged sediments, peat columns, etc).
- 7.12 Any finds of human remains will be left *in situ*, covered and protected. In Scotland the local police will be informed. If removal is essential this will only take place with police approval, and in compliance with Historic Scotland's Operational Policy Paper '*The Treatment of Human Remains in Archaeology*'. In England and Wales the coroner's office will be informed. If removal is essential it will only take place under the relevant Home Office licence and local authority environmental health regulations.
- 7.13 All finds of gold and silver will be moved to a safe place. Where removal cannot be effected on the same working day as the discovery, suitable security measures will be taken to protect the artefacts from theft or damage. In Scotland the recovery of such material, along with all other finds, will be reported to the Queen's and Lord Treasurer's Remembrancer. In England and Wales the recovery of such material will be reported to the coroner's office according to the procedures relating to Treasure Trove.
- 7.14 After recording, the trenches will be backfilled with excavated material.
- Recording*
- 7.15 For each trench, a block of numbers in a continuous sequence will be allocated.
- 7.16 Written descriptions, comprising both factual data and interpretative elements, will be recorded on standardised sheets.

- 7.17 Where stratified deposits are encountered a 'Harris'-type matrix will be compiled during the course of the excavation.
- 7.18 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.
- 7.19 Plans will normally be drawn at a scale of 1:100, but on urban or deeply stratified sites a scale of 1:50 or 1:20 will be used. Burials will be drawn at 1:10. Other detailed plans will be drawn at an appropriate scale.
- 7.20 Long sections of trenches showing layers and any cut features will be drawn at 1:50. Sections of features or short lengths of trenches will be drawn at 1:20.
- 7.21 Generally all sections will be accurately related to Ordnance Datum. There may, occasionally, be instances where this is unnecessary when it will be agreed with the local authority's archaeological representative in advance.
- 7.22 Registers of sections and plans will be kept.
- 7.23 A full colour print and colour transparency photographic record will be maintained. This will illustrate the principal features and finds both in detail and in a general context. The photographic record will also include working shots to represent more generally the nature of the fieldwork.
- 7.24 A register of all photographs taken will be kept on standardised forms.
- 7.25 All recording will be in accordance with the standards and requirements of the *Archaeological Field Manual* (Museum of London Archaeology Service 3rd edition 1994).

Finds

- 7.26 All identified finds and artefacts will be collected and retained. Certain classes of material, ie post-medieval pottery and building material, may on occasion be discarded after recording if a representative sample is kept. No finds will be discarded without the prior approval of the archaeological representative of the local authority and the receiving museum.
- 7.27 Finds will be scanned to assess the date range of the assemblage with particular reference to pottery. In addition the artefacts will be used to characterise the site, and to establish the potential for all categories of finds should further archaeological work be necessary.
- 7.28 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum. Finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in United Kingdom Institute for Conservation's *Conservation Guidelines No. 2*.
- 7.29 In England and Wales, at the beginning of the project (prior to commencement of fieldwork) the landowner and the relevant museum will be contacted regarding the preparation, ownership and deposition of the archive and finds. In Scotland all archaeological material recovered belongs to the Crown and its disposal is administered by the Queen's and Lord Treasurer's Remembrancer.

APPENDIX 8

Evaluation reports

- 8.1 The style and format of the evaluation report will be determined by AOC Archaeology, but will be compliant with Historic Scotland's issued guidance on Data Structure Reports. The report will include as a minimum the following;
 - i) A location plan of the site.
 - ii) A location plan of the trenches and/or other type of fieldwork strategy employed.
 - iii) Plans and sections of features and/or extent of archaeology located. These will be at an appropriate scale.
 - iv) A summary statement of the results.

- v) A table summarising per trench the deposits, features, classes and numbers of artefacts encountered and spot dating of significant finds.
 - vi) Consideration to the methodology will be given along with a confidence rating for the results.
- 8.2 When an evaluation is followed by an excavation the procedures defined in English Heritage's *Management of Archaeological Projects* 2nd edition 1991 will be followed for immediate post-field archive preparation and initial assessment. It will then be agreed with the local authority's archaeological advisor which aspects will need to be taken forward to the report stage.

APPENDIX 9

Area excavation

- 9.1 Prior to the stripping of any area excavation, all appropriate surveys (eg geophysical, earthwork, contour) or sampling strategies (eg for topsoil artefact densities, metal detecting, phosphate analysis) will be undertaken.
- 9.2 In most cases sites will be mechanically stripped of topsoil and other overburden. An appropriate machine will always be used. This will normally be a 360° tracked excavator with a between 1.4 and 2.4m wide toothless bucket. In other cases a JCB 3CX (or similar), or for work with restricted access or working room a mini-excavator such as a Kubota KH 90 will be used. Suitably sized dumpers or lorries will be employed to remove spoil. No plant will be allowed to cross stripped areas.
- 9.3 All machining will be undertaken under the direct control of experienced archaeologists.
- 9.4 All undifferentiated topsoil or overburden will be removed down to the first significant archaeological horizon in level spits. The archaeological horizon to which the material will be cleared will have first been established by an evaluation or by the digging of test pits.
- 9.5 Depending on the aims of the project, the excavated spoil may be monitored in order to recover artefacts. Where their findspots are plotted this will usually be on a 2m grid.
- 9.6 The surface exposed by the stripping will be cleaned using appropriate hand tools.
- 9.7 Should the site grid not have already been established it will be done at the cleaning stage. The grid will normally be based on a 10m spacing and related to the National Grid. A temporary bench mark related to Ordnance Datum will be founded
- 9.8 After the cleaning and planning of the excavation area the sampling strategy will be finalised. This will take into account the project aims (which may need modifying at this stage) and the type, quality and quantity of remains revealed. The sampling strategy will normally seek to maintain at least the following levels;
 - i) all structures and all zones of specialised activity (eg funerary, ceremonial, industrial, agricultural processing) will be fully excavated and all relationships recorded;
 - ii) ditches and gullies will have all relationships defined, investigated and recorded. All terminals will be excavated. Sufficient lengths of the feature will be excavated to determine the character of the feature over its entire course; the possibility of re-cuts of parts of the feature, and not the whole, will be considered. This will be achieved by a minimum 10% sample of each feature (usually a 1m section every 10m).
 - iii) Sufficient artefact assemblages will be recovered (where possible) to assist in dating the stratigraphic sequence and for obtaining ample ceramic groups for comparison with other sites;
 - iv) all pits, as a minimum, will be half-sectioned. Usually at least 50% (by number) of the pits will be fully excavated. Decisions as to which pits will be fully excavated will be taken in the light of information gained in the half-sectioning taking into consideration, amongst other things; pit function, artefact content and location;

- v) for post and stake holes where they are clearly not forming part of a structure (see above) 100% (by number) will be half-sectioned ensuring that all relationships are investigated. Where deemed necessary, by artefact content, a number may demand full excavation;
- vi) for other types of feature such as working hollows, quarry pits, etc the basic requirement will be that all relationships are ascertained. Further investigation will be a matter of on-site judgement, but will seek to establish as a minimum their extent, date and function;
- vii) for layers, an on-site decision will be made as to the limits of their excavation. The factors governing the judgement will include the possibility that they mask earlier remains, the need to understand function and depositional processes, and the necessity to recover sufficient artefacts to date the deposit and to meet the project aims.

9.9.1 For palaeoenvironmental research different sampling strategies will be employed according to established research targets and the perceived importance of the strata under investigation. AOC Archaeology conventionally recovers three main categories of sample;

- i) Routine Soil Samples; a representative 500g sample from every excavated soil context on site. This sample is used in the characterisation of the sediment, potentially through pollen analysis, particle size analysis, pH analysis, phosphate analysis and loss-on-ignition;
- ii) Standard Bulk Samples; a representative 10 litre sample from every excavated soil context on site. This sample is used, through floatation sieving, to recover a sub-sample of charred macroplant material, faunal remains and artefacts;
- iii) Purposive or Special Samples; a sample from a sediment which is determined, in field, to either have the potential for dating (wood charcoal for radiocarbon dating or *in situ* hearths for magnetic susceptibility dating) or for the recovery of enhanced palaeoenvironmental information (waterlogged sediments, peat columns, etc).

9.10 Any finds of human remains will be left *in situ*, covered and protected. In Scotland the local police will be informed. If removal is essential this will only take place with police approval, and in compliance with Historic Scotland's Operational Policy Paper '*The Treatment of Human Remains in Archaeology*'. In England and Wales the coroner's office will be informed. If removal is essential it will only take place under the relevant Home Office licence and local authority environmental health regulations.

9.11 All finds of gold and silver will be moved to a safe place. Where removal cannot be effected on the same working day as the discovery, suitable security measures will be taken to protect the artefacts from theft or damage. In Scotland the recovery of such material, along with all other finds, will be reported to the Queen's and Lord Treasurer's Remembrancer. In England and Wales the recovery of such material will be reported to the coroner's office according to the procedures relating to Treasure Trove.

Recording

9.12 All on-site recording will be undertaken in accordance with the standards and requirements of the *Archaeological Site Manual* (Museum of London 1994).

9.13 A continuous unique numbering system will be employed.

9.14 Written descriptions, comprising both factual data and interpretative elements, will be recorded on standardised sheets.

9.15 Where stratified deposits are encountered a 'Harris'-type matrix will be compiled during the course of the excavation.

9.16 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.

- 9.17 Plans will normally be drawn at a scale of 1:100, but on urban or deeply stratified sites a scale of 1:50 or 1:20 will be used. Burials will be drawn at 1:10. Other detailed plans will be drawn at an appropriate scale.
- 9.18 Long sections of trench edges or internal baulks showing layers and any cut features will be drawn at 1:50 or 1:20 depending on amount of detail contained. Sections of features will be drawn at 1:20.
- 9.19 All sections will be accurately related to Ordnance Datum.
- 9.20 Registers of sections and plans will be kept.
- 9.21 A full colour print and colour transparency photographic record will be maintained. This will illustrate the principal features and finds both in detail and in a general context. The photographic record will also include working shots to represent more generally the nature of the fieldwork.
- 9.22 A register of all photographs taken will be kept on standardised forms.

Finds

- 9.23 All identified finds and artefacts will be collected and retained. Certain classes of material, ie post-medieval pottery and building material may on occasion be discarded after recording if a representative sample is kept. No finds will be discarded without the prior approval of the archaeological representative of the local authority and the receiving museum.
- 9.24 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum. Finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in United Kingdom Institute for Conservation's *Conservation Guidelines No. 2*.
- 9.25 In England and Wales, at the beginning of the project (prior to commencement of fieldwork) the landowner and the relevant museum will be contacted regarding the preparation, ownership and deposition of the archive and finds. In Scotland all archaeological material recovered belongs to the Crown and its disposal is administered by the Queen's and Lord Treasurer's Remembrancer.

Archiving, post-excavation and publication

- 9.26 Following completion of each stage or the full extent of the fieldwork (as appropriate) the site archive will be prepared in the format agreed with the receiving institution.
- 9.27 On completion of the archive a summary report will be prepared. This will include;
 - i) an illustrated summary of the results to-date indicating to what extent the project aims were fulfilled;
 - ii) a summary of the quantities and potential for analysis of the information recovered for each category of site, artefact, dating and palaeoenvironmental data;
 - iv) proposals for analysis and publication.
- 9.28 The proposals for analysis and publication will include;
 - i) a list of the revised project aims arising from the fieldwork and post-excavation assessment;
 - ii) a method statement which will make clear how the methods advocated are those best suited to ensuring that the data-collection will fulfil the stated aims of the project;
 - iii) a list of all tasks involved in meeting the stated methods to achieve the aims and produce a report and research archive in the stated format;
 - iv) details of the research team and their projected work programmes in relation to the tasks. Allowance will be made for general project-related tasks such as project meetings, management, editorial and revision time;

- v) a publication synopsis indicating publisher, report format and content shown by chapters, section and subheadings with the anticipated length of text sections and proposed number of illustrations.
- 9.29 The summary report embracing the analysis and publication proposals will be submitted to the client and the local authority's archaeological representative for approval.
- 9.30 Any significant variation in the project design, including timetables, proposed after the agreement of the proposals must be acceptable to the local authority's archaeological representative.
- 9.31 The results of the project will be published in an appropriate archaeological journal or monograph. The suitable level of publication will be dependent on the significance of the project results, but as a minimum the basic requirements of Appendix 7.1 of *Management of Archaeological Projects* (English Heritage 1991) will be met.

APPENDIX 10

Standing Building Assessment

- 10.1 A standing building assessment will normally take place in concordance with a Conservation Plan, but may also form part of a Desk-Based Assessment if required.
- 10.2 A visual inspection will be made of both the interior and exterior of the building(s) with a view to establishing the extent of the architecturally important elements that should be included in a later phase of historic building recording work.
- 10.3 A brief written record will be made in addition to digital photography of areas of interest to support recommendations and outline architectural features within the building(s).

APPENDIX 11

Historic Building Recording: The Written Record (Levels 0-6)

- 11.1 Pro forma building recording sheets will be used for the basic written record of the building(s) including comments on the condition, construction techniques, materials, fixtures and fittings and interpretation of function. A competent analysis will be made of all building phases and any relationship between buildings. Day Book records will also be kept for any levels of recording above Level 1.
- 11.2 At Level 4, the written record will encompass a thorough context description of each broad phase of construction and alteration with a view to formulating a stratigraphic matrix of the site.

APPENDIX 12

Historic Building Recording: Photography (Levels 1-5)

- 12.1 Photography will take place at all levels of building recording, and will be undertaken with a single lens reflex camera with through-the-lens (TTL) light metering. A standard 28-90mm lens will be used at all times except where wider or shorter angle lenses are required for longer elevation photography and detailed photography.
- 12.2 The camera will be placed at mid-height to the subject with due care and attention to lighting situations. Two shots will be taken of each feature, undertaken by a light-meter reading of a two-step change in aperture. This change up or down will depend on light conditions.
- 12.3 Interior photography will be undertaken with appropriate lighting conditions and the use of a tripod. Where light access is still quite minimal, an automatic flash will be used.

- 12.4 All photography will be taken on colour slide and black & white negative film, such as Kodak PLUS-X or Ilford FP4, or approved equivalent. It should be exposed and processed to an archival standard, i.e., fix and wash in accordance with the manufacturers specifications.
- 12.5 The use of a digital camera may be used as a reference to survey and drawn elevations and ground plans on-site.

APPENDIX 13

Historic Building Recording: Rectified Photography and Photogrammetry (Level 3)

- 13.1 An external contractor will carry out rectified photography and photogrammetry in compliance with the following guidelines:
- i) All photography will be carried out with an approved type of camera. Details of the camera used may be supplied on completion of the project.
 - ii) The smallest permissible photographic negative scale will normally be defined as follows: for 1:50 scale plotting, negative scale should be no more than 1:200 and for 1:20 scale plotting, negative scale should be no more than 1:200.
 - iii) All rectified photography will be taken on black & white negative film, such as Kodak PLUS-X or Ilford FP4, or approved equivalent. It should be exposed and processed to an archival standard, i.e., fix and wash in accordance with the manufacturers specifications.

APPENDIX 14

Historic Building Recording: Elevation Recording (Level 2)

- 14.1 All elevations drawn or surveyed will be a 'preservation by record' of the current state of the building. The following categories will be recorded:
- i) All architectural features with associated decorative detail including windows, doors, quoin stones, string courses, roof lines and other structural stonework and jointing.
 - ii) Fixtures and fittings such as drainpipes and guttering, signs, brackets and vents.
 - iii) Later modifications and/or damage to the building such as structural cracks, areas of erosion, patches of rendering, blocked doorways, windows and other openings.
- 14.2 Large or small repetitive features such as windows, capitals, mouldings, etc. sampling will be undertaken as appropriate.
- 14.3 Where the façade is of stone construction each individual stone may be recorded. However, in most instances, a representative area, usually 1m², will be sufficient, although windows, corner stones and other architectural details will always be fully recorded. The degree of recording for ashlar will be depend upon the scale with which the elevation is to be produced and will be determined in advance of the start of works. When drawings are carried out at 1:50, a single line between the joints of the stone will normally be considered satisfactory. However, if there is a considerable gap between the stones, both sides of the stone will be shown. At a scale of 1:20 or larger, then all joints will normally be shown except where the stone is very fine ashlar.
- 14.4 Elevation recording by hand will normally take place if it is inappropriate to do so by survey. The size and complexity of an elevation will determine what on-site scale will be required. In general, a scale of 1:50 will be deemed appropriate with a larger scale adopted if portions of this elevation are more complex. For highly detailed architectural detail a scale of 1:1 may be appropriate.
- 14.5 All hand-drawn measured elevations and detail will be drawn using water-resistant paper with a hard 4H – 6H pencil. A levelled datum line will be taken through the centre of the elevation with offset measurements. All datum points will be accurately positioned within the site either by hand or by survey.

APPENDIX 15**Historic Building Recording: Elevation Recording – By Survey (Levels 2-4)**

- 15.1 Where appropriate, elevations may be recorded by radiation survey using a reflectorless EDM (REDM) Leica TCR 705. This method of survey allows the accurate capture of data of upper floor levels. If more than one elevation is to be recorded, then a traverse will be created around each building or group of buildings. Extra stations may be set up in places where there is limited access. Values in the traverse will be adjusted by Bowditch adjustment to compensate for any errors in measurement. The adjusted values will then be calculated using LisCAD Plus v5.0 (Surveying and Engineering Module). Co-ordinates will be located by resection from existing traverse points. The survey data will be downloaded to a laptop computer on-site via Leica Office software. All measurements taken by survey will consist of three-dimensional co-ordinates relating to the Ordnance Survey National Grid.
- 15.2 The recording of an elevation will not be carried out by survey equipment if:
- i) There are too many obstructions;
 - ii) The surface of the building is too dark or mossy;
 - iii) There is too much curved architectural detail;
 - iv) The distance required to set up the survey equipment in front of the elevation is too large (i.e., more than 25m) or too short to capture data from the upper levels of the elevation.
- 15.3 Where appropriate, elevations carried out by survey will be supplemented by detail measured by hand.

APPENDIX 16**Historic Building Recording: Interior Recording (Levels 2-4)**

- 16.1 The recording of the interior(s) of the building(s) will consist of a written record and, where appropriate, measured sketch plans of the ground plan and the roof elevations based on the following guidelines:
- i) Critical analysis of the interior condition, construction, materials, fixtures and fittings will be made using *pro forma* recording sheets.
 - ii) Measured interior ground plans of each room of the interior will be carried out using tapes and a Leica Disto™ Classic electronic distance measurer.
 - iii) All measured plans will contain: notes on the size of structural members, and finishes; floor levels, change in levels, and ceiling heights; direction of stair rises in plan with each riser numbered; the positions of service entry points, plant and machinery and sanitary fittings; below-ground drainage; soil and vent stacks and rainwater pipes where appropriate.

APPENDIX 17**Historic Building Recording: Standard Report Illustrations (Level 6)**

- 17.1 All final illustrations for archive will be produced digitally on the Computer-Aided Drawing package, AutoCAD 2000i/2000LT and/or Adobe Illustrator v9/v10. A standard methodology will be used with all drawings adhering to the following guidelines:
- 17.2 Line Weight. The appropriate line weight will depend on anticipated plot scale and may need editing if the output scale is to change. The degree of detail used will affect the line weight utilised in the finished drawing. All fine architectural detail (stonework, moulded stonework, brickwork, etc.) will be produced at a line weight of 0.05mm. More general architectural features (outlines of

- doors and windows, etc.) will be produced at a line weight of 0.09mm. A much heavier line will indicate the changing of plane in complex elevations.
- 17.3 Text. Text will be made clear and informative, with orientation, position, size and letter spacing remaining appropriate to the layout of the plotted sheets.
- 17.4 Scale. No archaeological or historic building survey will be carried out without a particular scale or range of scales in mind.
- 17.5 Layers. The layering system in Computer Aided Drawing packages allow the separation of data into specified criteria. To achieve this, there is an AOC standard layering system. This system is largely based on the coding system inherent in the use of the reflectorless EDM Leica TCR705.
- 17.6 Digital Archiving. All drawings are produced at a 1:1 scale for easy scaling in .dxf or .dwg format. At the end of a project, all data is stored on CD-ROM.

APPENDIX 18

Historic Building Recording: Dendrochronological Analysis (Level 3)

- 18.1 Dendrochronological analysis of timbers from standing building is primarily undertaken to provide accurate dates for its construction. Where appropriate, samples may be taken for analysis to provide information on the source and quality of the timber, thus informing on the social and economic context of the building.
- 18.2 Samples for analysis will take place under the following conditions:
- i) That the timber sample taken is from a species where date chronologies already exist, namely oak and pine.
 - ii) A minimum of eight timbers per phase or building are required to cross-match results.
 - iii) The ring patterns inherent in a timber sample must be over a certain length, usually seventy rings.
- 18.3 The method of the removal of samples of timber will be to use a corer attached to a power-driven drill, removing a core leaving a hole in the timber 10mm in diameter. The core will be taken so that a maximum radius from pith to bark is taken, thus ensuring the maximum numbers of growth rings for analysis. Timbers will be selected which have retained a full ring sequence as possible (i.e., those where the outermost rings have not been trimmed off or destroyed by woodworm).
- 18.4 Where it is impossible to use this intrusive method of sample, for example, in the case of painted ceilings and carved panels, the ring sequence can be measured *in situ* using a hand lens. Silicone rubber casts can also be taken where the end grain is exposed.

APPENDIX 19

Historic Building Recording: Paint and Wallpaper Analysis (Level 3)

- 19.1 Paint and/or wallpaper analysis will usually only take place where layers that have been applied over the years have not been removed. Where appropriate, paint analysis can take place by methods of scraped samples or thin section analysis. Cross-sections may also be obtained from samples of paint to reveal a stratigraphy of paint layers.

APPENDIX 20

Historic Building Recording: Reporting (Levels 0-6)

- 20.1 The style and format of the final report on historic building recording works will be determined by AOC Archaeology, but will be compliant with Historic Scotland's issued guidance on Data

Structure Reports. The content of this report will depend greatly in the level of works that have taken place but at minimum will include:

- i) A location plan of the site showing the areas under investigation numbered and cross-referenced in the text;
- ii) A summary statement of the results;
- iii) An introduction, methodology and results of the works;
- iv) Photographic plates to illustrate the text.

- 20.2 Where a programme of historic building recording has taken place at Level 2 or above, the Data Structure Report will contain a number of illustrations, the format of which is outlined in more detail in Appendix 17.

APPENDIX 21

Watching Briefs

- 21.1 Where the archaeologist (Watching Brief Officer) has no remit over the working methodology of the site (specification of machine or depth of excavation). The Watching Brief Officer will simply observe the works and record their nature and form. Where the Watching Brief Officer specifies the site methodology, ie type of machine and depth of excavation. AOC Archaeology's preferred approach is to consider the Watching Brief Area as a large evaluation trench and follows in general, Appendix 7.
- 21.1 It is important to stress that the client determines the area affected and unless instructed by a curator the Watching Brief Officer has no power to extend the area unless it is to fully excavate a human body that otherwise would have been truncated by the works.
- 21.2 In addition to the general principles outlines in Appendix 7 the following approaches will be undertaken:
- i) a record will be made of all site attendances;
in general a written and photographic record will be kept of the excavated sediments;
 - ii) where archaeological features are identified and they can be dealt with in less than two hours this work will be undertaken by the Watching Brief Officer. Recording and excavation protocols will follow Appendices 7.9 –7.11;
 - iii) where archaeological remains requiring more than two hours of excavation and recording, the Watching Brief Officer will stop the works and both the curator and the client will be contacted to devise a mitigation strategy. All delays will be kept to a minimum. Any resultant excavation and recording work will be in keeping with the methods outlined in Appendix 9;
 - iv) the extent of the watching brief area will not be recorded unless specifically required by either the client or the curator. Where such recording is required the area will be accurately recorded by total station and linked into the Ordnance Datum;
 - v) Reporting of Watching Briefs will follow methods specified in Appendix 8.

APPENDIX 22

General

- 22.1 The requirements of the Brief will be met in full where reasonably practicable .
- 22.2 Any significant variations to the proposed methodology will be discussed and agreed with the local authority's archaeological representative in advance of implementation.
- 22.3 The scope of fieldwork detailed in the main part of the Written Scheme of Investigation is aimed at meeting the aims of the project in a cost-effective manner. AOC Archaeology Group attempts to foresee all possible site-specific problems and make allowances for these. However there may

on occasions be unusual circumstances which have not been included in the programme and costing. These can include;

- i) unavoidable delays due to extreme weather, vandalism, etc;
- ii) trenches requiring shoring or stepping, ground contamination, unknown services, poor ground conditions;
- iii) extensions to specified trenches or feature excavation sample sizes requested by the local authority's archaeological advisor;
- iv) complex structures or objects, including those in waterlogged conditions, requiring specialist removal.

Health and Safety

22.4 All relevant health and safety legislation, regulations and codes of practice will be respected.

22.5 With the introduction of the Construction, Design and Management Regulations 1994, AOC Archaeology works with Clients, Main Contractors, and Planning Supervisors to create a Health and Safety Plan. Where CDM regulations apply, each project will have its own unique plan.

Insurances

22.6 AOC Archaeology holds Employers Liability Insurance, Public Liability Insurance and Professional Indemnity Insurance. Details can be supplied on request.

22.7 AOC Archaeology will not be liable to indemnify the client against any compensation or damages for or with respect to;

i) damage to crops being on the Area or Areas of Work (save in so far as possession has not been given to the Archaeological Contractor);

ii) the use or occupation of land (which has been provided by the Client) by the Project or for the purposes of completing the Project (including consequent loss of crops) or interference whether temporary or permanent with any right of way light air or other easement or quasi easement which are the unavoidable result of the Project in accordance with the Agreement;

iii) any other damage which is the unavoidable result of the Project in accordance with the Agreement;

iv) injuries or damage to persons or property resulting from any act or neglect or breach of statutory duty done or committed by the client or his agents servants or their contractors (not being employed by AOC Archaeology) or for or in respect of any claims demands proceedings damages costs charges and expenses in respect thereof or in relation thereto.

22.8 Where excavation has taken place evaluation trenches will be backfilled with excavated material but will otherwise not be reinstated unless other arrangements have previously been agreed. Open area excavations normally will not be backfilled but left in a secure manner unless otherwise agreed.

Copyright and confidentiality

22.9 AOC Archaeology will retain full copyright of any commissioned reports, tender documents or other project documents under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it will provide an exclusive licence to the Client in all matters directly relating to the project as described in the Written Scheme of Investigation.

22.10 AOC Archaeology will assign copyright to the client upon written request but retains the right to be identified as the author of all project documentation and reports as defined in the Copyright, Designs and Patents Act 1988.

22.11 AOC Archaeology will advise the Client of any such materials supplied in the course of projects which are not AOC Archaeology's copyright.

22.12 AOC Archaeology undertake to respect all requirements for confidentiality about the Client's proposals provided that these are clearly stated. In addition AOC Archaeology further undertakes to keep confidential any conclusions about the likely implications of such proposals for the historic

environment. It is expected that Clients respect AOC Archaeology's and the Institute of Field Archaeologists' general ethical obligations not to suppress significant archaeological data for an unreasonable period.

Standards

- 22.13 AOC Archaeology conforms to the standards of professional conduct outlined in the Institute of Field Archaeologists' Code of Conduct, the IFA Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, the IFA Standards and Guidance for Desk Based Assessments, Field Evaluations etc., and the British Archaeologists and Developers Liaison Group Code of Practice.
- 22.14 Project Directors normally will be recognised in an appropriate Area of Competence by the Institute of Field Archaeologists.
- 22.15 Where practicable AOC Archaeology will liaise with local archaeological bodies (both professional and amateur) in order that information about particular sites is disseminated both ways (subject to client confidentiality).

APPENDIX 23

Specialist staff

The following specialist staff may be used on this project depending on the type of artefacts and soil samples recovered during the course of the fieldwork.

AOC Archaeology Staff:

Dr. Clare Ellis	Soils and sediments analysis
Dr. Anne Crone	Dendrochronology, charcoal and timber analysis
Dr. Coralie Mills	Pollen analysis, dendrochronology
Dr. Ciara Clarke	Pollen analysis
Mr. Rob Engl	Lithics & coarse stone
Mr. Murray Cook	Mammal bone
Dr. Lindsey Thompson	Stone condition survey
Ms. Melissa Melikian	Human bone
Ms Alys Vaughan-Williams	Macroplant specialist
Mr Robin Inglis	Soil analysis
Mr Alan Duffy	Charcoal identification
Mr Fred Van de Walle	Artefact conservation

Sub-contractors

Mr. Bob Clark	Industrial archaeology & coal-mining
Ms Marta McGlynn	Historic designed landscapes
Dr. Ruby Ceron-Carasco	Marine shell and fish bone
Dr. Ann MacSween	Prehistoric pottery
Ms. Naomi Crowley	Building material, medieval and post-medieval pottery Ms.Amanda
Clydesdale	Plaster, paint and wallpaper analysis

APPENDIX 24

Post-excavation

24.1 *Sample Flotation*

Sample flotation is a water recovery technique designed to separate organic remains from the soil matrix. A Siraf style system of flotation and wet-sieving will be operated by the archaeological contractor. This system comprises an enclosed area of water into which the soil samples are deposited and agitated. Due to the difference in densities of organic and inorganic remains the light fractions will float, the heavy fractions will sink and the silt fraction will be washed away. The resulting floating material (flot) is collected in sieves of 0.3 mm and 1 mm, the non-floating residue (retent) is wet-sieved through a 1 mm mesh.

All flots and retents are air dried, bagged and labelled accordingly. Throughout this process all equipment is kept clean to prevent contamination of the samples. For each sample, a Sieving Assessment sheet is completed. This gives basic information about the sample, retent and flot. Prior to flotation and wet-sieving, the volume of each sample is measured by means of a graduated bucket.

If in a sample a high concentration of clay can be observed and therefore separation of the different fractions of the soil is difficult, an aqueous solution of defloculant 'Calgon' is added and the sample is left to soak overnight, before processing by flotation and wet-sieving.

Sample flotation will be carried out on site and/or at the premises of the archaeological contractor.

24.2 *Sample Wet sieving*

Sample wet sieving, also a water recovery technique, is carried out in laboratory conditions and is designed to recover waterlogged material. For the recovery of waterlogged botanical material, small soil samples (0.5 to 1.0 litre) are processed through a 0.3 mm sieve. The sediment is placed in a bucket with water and agitated before being washed through the 0.3 mm sieve. This process is repeated until the sample is totally disaggregated. The resulting material is stored in water or ethanol depending on the length of the storage period. Sample wet sieving can also be used to recover larger waterlogged material such as leather and wood in which case larger volumes of soil are processed.

24.3 *Sample Dry sieving*

Sample dry sieving is carried out to retrieve smaller artefacts that might be missed during normal excavation procedure, eg. small sherds of pottery and bone. Done in laboratory conditions, all samples are air dried in the first instance. Done in the field, the samples are processed with the sample in a field-moist state. In both cases the sample is passed through a 4 mm mesh and any items of interest are recovered and recorded.

24.4 *Residue sorting*

All residue (retent) sorting is carried out in laboratory conditions, and is designed to recover not only material that might be missed during normal excavation procedure (see dry sample sieving), but also material that would be impossible to recover during normal excavation procedure eg. charred and uncharred plant remains, insect remains and small fragments of charcoal.

The volume of the residue is recorded and then passed through a set of sieves (mesh sizes 8 mm, 4 mm, 2 mm and 1 mm). Each fraction is spread out onto a separate tray, is scanned with the naked eye and all items of interest are recovered. Under normal circumstances all identifiable material from all fractions is recovered. The only exception to this is burnt wood (charcoal) which is only retrieved from the > 4 mm fractions. All material recovered is bagged individually by material type and the material types and weights recorded on the Retent Sorting Sheet. Also recorded on this sheet are the project number, context number, area, sample number, the sorters initials, date, sample volume, retent volume and percent of the retent sorted. Under normal circumstances 100 % of all fractions are sorted. In those instances where this is not the case, this will be recorded.

Where no material is recovered from a retent, the Retent Sorting Sheet will be filled out as usual, with the word sterile written across it.

24.5 *Flot sorting*

All flot sorting is carried out in laboratory conditions. The volume of each flot is measured. The flots are sorted by means of a low powered binocular microscope. The macro plant remains and other archaeological or ecological material are extracted from the flots and put into gelatine capsules or glass tubes. An estimate of the number of items recovered and the species represented are recorded. The charcoal larger than 4mm is extracted from the flots and weighed. All extracted items are bagged and labelled accordingly.

24.6 *Routine Soils Analysis*

All the samples taken on-site will have a routine partner. Four standard routine soil tests will be carried out by the archaeological contractor. These are pH analysis, Loss on Ignition, Calcium Carbonate content and Easily available phosphate content.

The pH value is the measure of the acidity (H+) or alkalinity (OH+) of the sample. Dissolving a portion of the soil in distilled water, then measuring the sample using pH meter carries this out. This is to allow us to estimate the potential for preservation within the sediment.

Loss on Ignition is the measure organic content of the sample. This is measured by burning a small amount of the sediment in a furnace at 400°C for four hours. By measuring the weight before and after burning the organic content can be calculated. The organic content allows us to examine whether manuring or treatment of the natural soil has taken place.

Calcium Carbonate content can be measured by dissolving a few grains of the sample using Hydrochloric acid. If calcium carbonate is present then a small amount of Carbon Dioxide is given off, the greater the amount of CO₂ released the greater the amount of CaCO₂. The Calcium Carbonate content shows us if there is any natural calcium carbonate within the sediment, or if not, any mortar or shell has been included artificially.

The amount of phosphate within a sample is examined at the same time as CaCO₂. After the CO₂ has been released Ascorbic acid is applied, if Phosphate is present a colour change will occur. The phosphate content may show the presence of animals or to a lesser degree indicate where animals were kept.

24.7 *Soil Micromorphological Analysis*

Micromorphology is the study of undisturbed soils and loose sediments and other materials at a microscopic scale. A 25-30 micron thick slice of soil or sediment is mounted on glass and studied using a petrographic microscope. The samples are prepared for thin section analyses at the Department of Environmental Science, University of Stirling using the methods outlined by Murphy (1986). The samples are analysed using the descriptive terminology of Bullock *et al* (1985) and FitzPatrick (1993).

Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G., Tursina, T. & Babel, U. 1985 *Handbook for soil thin section description*. Wolverhampton: Waine research Publications.

FitzPatrick, E.A. 1993. *Soil microscopy and micromorphology*. Chichester: John Wiley & Sons.

Murphy, C. P. 1986. *Thin section preparation of soils and sediments*. Berkhamsted: AB Academic Press.

24.8 *Charcoal ID*

Only charcoal retrieved from the 4mm sieve (see Sieving and Sorting procedures) is used for species identification, mainly because fragments below that threshold are too small to identify. If

there is no charcoal larger than 4mm present then attempts will be made to identify the largest fragments present for the purpose of C14 samples.

Surfaces are prepared for identification by using a surgical blade to prise off flakes of charcoal revealing fresh surfaces on which diagnostic features can be identified. The charcoal fragment is bedded in sand for examination under a reflected-light microscope.

On average, up to 10 fragments of charcoal are identified per bulk sample. If a single species is present then identification can stop at 5 fragments. However, if a great variety of species is present, ie more than four, then identification should continue until the analyst is happy that a representative sample has been examined. Unusual or exotic species should be bagged and labelled separately within the bulk sample.

Other variables, such as whether the fragment is young roundwood, with sub-bark surfaces intact, whether it has come from a large piece of wood and whether it is fast or slow grown, should be noted.

Species identification is undertaken with reference to Schweingruber's (1982)

24.9 *Wood ID*

Waterlogged wood; Surfaces on waterlogged wood are prepared for identification by using a cut-throat razor or a double-sided razor blade to pare off thin-sections which are cell-thick and transparent so that diagnostic features can be identified. It is consequently difficult to identify fragments of waterlogged wood smaller than 10 mm². The thin-sections are temporarily mounted in water on slides for examination under a transmitted-light microscope.

Sampling for identification is carried out on the same basis as that for charcoal. Species identification is undertaken with reference to Schweingruber's (1982) *Microscopic Wood Anatomy* and the in-house reference collection of the archaeological contractor.

24.10 *Non-charcoal charred plant macrofossil analysis and Waterlogged plant analysis*

Analysis of the charred plant macrofossils and waterlogged plants involves identification, quantification and interpretation. Identification of the macro plant remains is done using a low power binocular microscope with x10 and x40 magnifications. The modern reference collection of the archaeological contractor and various seed atlases (Beijerinck 1947, Berggren 1969 & 1981 and Anderberg 1994) will be used to ease identification. The botanical nomenclature follows Flora Europaea (Tutin *et al* 1964-1981). A standardised counting method is used for quantification. Habitat information for the plant species will be taken from Hanf (1983).

24.11 *Dendrochronological analysis*

Sample size and species type; Three conditions are necessary to ensure the successful dating of a building or archaeological site. The timber must be a species for which there are already dated chronologies which in the UK usually means oak. Cross-matching is a statistical process, and therefore a number of timbers are required, usually at least 8 per building or phase. Finally, and for the same reasons the ring-patterns must be over a certain length, usually 70 rings. With these conditions observed it can be relatively straightforward to obtain a date for a building.

On-site sampling; *In situ* timbers in a standing building are usually sampled using a corer, which is attached to a power-driven drill and removes a core leaving a hole in the timber 10 mm in diameter. The core must be taken so that the maximum radius from pith to bark is sampled, thus ensuring the maximum number of growth-rings for analysis. It is also important to select those timbers which have retained as full a ring sequence as possible, ie those where the outermost rings have not been trimmed off or destroyed by woodworm.

Coring is an intrusive method of sampling and it is occasionally impossible to use this method, as in the case of painting ceilings and carved panels. If the end-grain is exposed the ring sequence can be measured *in situ* using a hand lens. Silicone rubber casts can also be taken.

If structural timbers have been removed during the renovation of a building then slices, approximately 50 mm thick can be sampled by saw, usually a chainsaw, from a point along the timber where the maximum radius survives.

Timbers only survive below ground in waterlogged conditions. Waterlogged timbers are sampled as above, by the removal of a 50 mm slice by sawing.

Sample preparation;

Cores are mounted in angle moulding and then the surface is prepared by paring with a Stanley knife followed by fine sanding with Wet&Dry sandpaper until the ring-pattern is clear and measurable.

Slices (dry); The surface of the slice is sanded, usually with a power sander, using progressively finer sandpaper until the ring-pattern is clear and measurable. It is often necessary to finish off the surface with W&D sandpaper.

Slices (wet); The slice is usually frozen for 24 hours and then the surface is planed flat using a Surform plane. This often achieves the necessary clarity of ring-pattern but where the wood is particularly hard it will be necessary to use a razor blade to pare the surface to achieve a clear ring-pattern.

Silicone rubber casts; These are fixed to battens of wood using silicone rubber, for ease of measurement.

Measurement and analysis; The samples are measured on a custom-made measuring table and the data logged onto the computer using DENDRO (Tyers 2000). Data graphing and statistical analysis are also carried out using the same package.

APPENDIX 25

Conservation

25.1 *Conservation principles*

The principles, ethical codes and techniques of conservation are under constant review by both practitioners and professional bodies. The archaeological contractor's approach to conservation will reflect current theory and practice, as recommended by the United Kingdom Institute for Conservation, the Scottish Museums Council, Resources for Museums and Galleries, the International Council on Museums and the International Institute for Conservation.

25.2 *Security*

The archaeological contractor will take all reasonable precautions to ensure the security of items brought in for conservation. The building will be protected by intruder detector systems; all conservation items will be kept in a secure locked store when not being worked on, and will not be left unattended. Particularly valuable items will be stored in a safe where required. A heat and smoke detection system will also be in operation 24 hours a day.

25.3 *Insurance*

Artefacts for conservation will not be covered by the contents insurance of the archaeological contractor. Insurance cover can be arranged for individual items and collections, but this is expensive. Clients are normally advised that the cheapest option is to extend their own insurance for these items for a fixed period. If required, the archaeological contractor could arrange additional insurance, and these costs would be passed on.

The archaeological contractor will have full professional indemnity cover for all its staff.

25.4 *Health and safety*

All relevant Health and Safety legislation, Regulations, Guidelines and Codes of Practice will be respected; Health and Safety plans will be compiled where Construction, Design and Management Regulations 1994 apply.

25.5 *Conservators and allied specialist services*

Professionalism: The conservators of the archaeological contractor will be graduates of approved conservation courses, and will have a thorough knowledge of current conservation practices in their particular specialist fields. The conservators will have been actively encouraged to broaden their skills and experience, and to obtain professional accreditation through the United Kingdom Institute for Conservation or PACR.

25.6 *Specialist post-excavation analyses*

Other services which the archaeological contractor will be able to offer are:

wood identification and woodworking analysis
 tree ring dating
 pollen analysis
 building materials analysis
 metal artefacts
 metalworking and glass working debris
 materials analysis
 textile analysis
 insects
 fish and shells
 bird bones
 plant remains
 bone identification
 soils specialist/geologist
 artefact specialist
 fibre identification
 leather identification

25.7 *Documentation*

Conservation complements the work of other professionals by preventing the deterioration of the artefact, and by ensuring that the wider community benefits from the additional information recovered about an artefact in the course of conservation work.

Conservation reports are normally supplied as a hard copy, but can also be supplied on disc in a variety of formats, according to the client's requirements. Reports are normally printed on paper with a guaranteed life expectancy of 150 years; photographic materials are processed to professional industry standards such as Q-Lab.

25.8 *Archival considerations*

The archaeological contractor will endeavour to ensure that the materials used to document artefacts undergoing treatment have a reasonable life span. Paper used will have an estimated lifetime of 150 years (HMSO specification), and all photographic films will be processed to industry standards by a processing company that specialises in high quality work for professional photographers. Radiography films and chemicals will be fresh and well within their expiry dates. All labelling of boxes etc. will be carried out with archival quality inks; labels will generally be duplicated for safety's sake.

Wherever possible, the archaeological contractor will consider the archiving requirements for the site, and may consult the receiving museum or archive about their requirements; the archaeological contractor will follow guidelines proposed by the Association of Museum Archaeologists.

The archaeological contractor will abide by current guidelines on the care and disposal of artefacts and human remains, as set out in:

The Disposal and Allocation of Finds

Publication and Archiving of Archaeological Projects

Treatment of Human Remains in Archaeology

Archaeological Project Design, Implementation and Archiving

25.9 *Museum of London Guidelines*

Museum of London requirements for conservation, recording, documentation, packing and archiving will be applied where these are a pre-condition.

25.10 *Assessment and estimating*

The assessment determines the condition of the artefact and the best means to ensure its survival. Radiography (x-raying) of the object is normally carried out at an early stage, and is compulsory for iron objects, which have poor survival prospects, and for some copper alloy artefacts.

The estimate for the work normally applies for six months; it may be necessary to review it thereafter. Conservation rates are agreed by negotiation.

25.11 *Recording*

Text and image records (paper, digital and/or film as appropriate) will be made of all artefacts before conservation commences. Any information recovered during cleaning and conservation (eg associated material, residues, corrosion products, manufacturing techniques) will be carefully recorded, with samples taken where necessary. Soil removed from an artefact during the process will normally be retained and returned with the object, unless the excavator and/or client decides that it is not required. Where necessary, experts will be consulted on the nature of any material discovered during cleaning or conservation of artefacts. All samples and slides will become part of the site archive and remain with the artefact.

The conservation report will also include recommendations for the care and curation of the assemblage; special finds with particular packing requirements will have clear handling and lifting instructions on the outside of any packaging.

25.12 *Conservation Record*

The conservation assessment sets out the proposed treatments for each type of artefact or material: these treatments can be discussed with the client, and with the museum, to take into account any priorities and display requirements. (See Section 9, Assessment)

25.13 *Radiography*

The archaeological contractor will x-ray all excavated iron objects, as well as some of the copper alloy, and any other items as requested by the excavator: information from the x-rays are incorporated into the conservation report. All metal artefacts can be x-rayed if required; only film and chemicals within their expiry date are used, washing periods are the optimum to maximise film preservation.

X-rays normally become part of the archive, and are returned to the client, with full details of exposure time and voltages used.

25.14 *Record photography*

All artefacts selected for conservation will be photographed (on colour slide film) at least once; usually before and after conservation, with a label and scale in the frame. Unusual artefacts, noteworthy features or modified conservation treatments will be photographed whenever appropriate.

All images will be recorded in the conservation report, and each slide labelled with the context and find number. The archaeological contractor will use Professional grade film, and a professional developing service to ensure maximum film stability. The slides form part of the conservation archive, and will remain with the artefact.

25.15 *On-site conservation and conservation on call*

A conservator can be available on site if required, and the conservators of the archaeological contractor can provide immediate advice over the phone at any time (specific arrangements must be made for out of hours working).

Advice on packing, lifting and transporting artefacts may be given in the early stages of a project.

25.16 *Conservation treatments*

The requirements of each artefact will be considered individually, and any remedial treatments carried out will use only recognised conservation treatments and approved materials. The archaeological contractor will be committed to CPD, which ensures that its conservation staff are fully cognisant with new developments in the field.

25.17 *Post-excavation storage*

It is recognised that budgetary arrangements may mean considerable time can elapse between excavation and conservation or Finds Disposal. All finds will be examined by a conservator on receipt; packing and storage materials will be renewed as necessary, and the archaeological contractor will ensure that all finds will be kept in a secure, stable environment until conservation treatments begin. Any finds that require immediate treatment will undergo conservation as soon as the conservators have consulted the Project Field Officer. Large volume storage at 1 ° C and -20 ° C; and storage for waterlogged material will be available in-house.

25.18 *Packing*

All artefacts will be packed in suitable inert materials, with silica gel if required. Fragile objects will be supported by Ethafoam, or similar, and lifting and handling instructions on the container. Especial care will be taken for artefacts, which will be going into long term storage. All containers will be carefully labelled, and box lists supplied.

APPENDIX 26

Archiving and finds disposal

26.1 *Finds disposal*

All artefacts and ecofacts recovered during an excavation sponsored by Historic Scotland (HS) are reported directly to HS via their own collections registrar. If all material has been fully analysed at this point, it is in most cases, transferred to an HS store. HS's Finds Disposal Panel (FDP) with permission of the Queen and Lord Treasurers Remembrancer (Q<R) then allocates the material to the appropriate museum for long term storage and possible display.

Artefacts and ecofacts recovered from excavations sponsored by other funding bodies are reported to the Crown via the Treasure Trove Advisory Panel (TTAP). The TTAP with permission of the Q<R then allocates the material to the appropriate museum for long term storage and possible display. Once the material has been allocated, it is then the museum's responsibility to arrange collection from the archaeological contractor.

26.2 *Archiving*

All archiving will be undertaken according to standards and guidelines set out by the National Monuments Record of Scotland (NMRS), located at the Royal Commission on the Ancient and

Historical Monuments of Scotland (RCAHMS). The archives of all archaeological works will be deposited to the NMRS.

APPENDIX 27

Publications

27.1 *General*

All publications by the archaeological contractor will be clear, correct and concise accounts of what was done and will reach standards acceptable to the archaeological profession. Final reports will be published within five years of the end of fieldwork. Publications should be published in popular archaeological, general and specialist formats to inform a wide readership of what work was done and must be made available to both lay and professional audiences for the foreseeable future. Publications must also provide good value for money in terms of the content and style of the publications. In DES entries and journal publications the role of the client will be fully acknowledged. In the popular publications and monographs suggested below the role of the client will be more fully promoted, with the display of the client's logo on the cover and a foreword by their representative. The over-riding aim of the procedures outlined in this section is to ensure that, during the duration of the project, a continuous stream of information about the archaeological works is made available for peer review and public consumption. The following stages and publication vehicles are envisaged;

27.2 *DES entries*

After the completion of each piece of on-site work, whether it be a watching brief, evaluation, set-piece excavation or building recording exercise a Data Structure Report (DSR) will be produced (see Fieldwork procedures). These are not reports intended for publication but they usually include a short summary which will be submitted for publication in *Discovery and Excavation Scotland* (DES), an annual summary of fieldwork published by the Council for Scottish Archaeology. It is proposed that an individual entry for each piece of on-site work will not be submitted; rather a single entry summarising all the works carried out in any one year will be compiled by the Project Manager. The DES summary is a standard requirement of planning authority archaeologists and ensures that notice of ground-breaking works is disseminated throughout the archaeological community.

27.3 *Journal publications*

Reports on the results of excavations are normally published either as an article in an academic journal or as a monograph in an appropriate series, depending on the scale of the results. The results of the set-piece excavations will be published as journal articles with reference to other on-site works such as watching briefs and building recording, where appropriate. The publication of these articles will follow on timeously from the completion of post-excavation works.

27.4 *Monograph publications*

The results of all the on-site works will be drawn together in a single volume, a monograph designed primarily for academic consumption. This will be published within 5 years of the completion of on-site works.

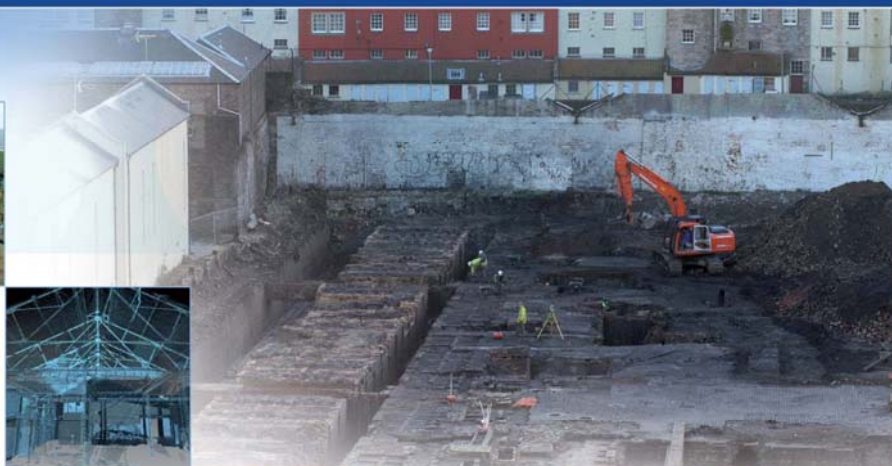
27.5 *Popular publications*

The results of all the on-site works will also be drawn together in 'popular' publications that augment the academic publications in making the results available to a wider public. This is a method of providing 'community gain' to the local and national community in return for its consent, through the planning process, to alter or demolish elements of the archaeological heritage. Popular publications may include, as deemed appropriate by the client, Internet reports within the web site

of the archaeological contractor, printed colour booklets, leaflets, on-site interpretative panels and exhibitions.

27.6 *Editorial procedures*

The archaeological contractor will apply their in-house editorial policy and procedures, through which any projects nominated for publication are normally submitted.



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