

13. CULTURAL HERITAGE

13.1 INTRODUCTION

AOC Archaeology Group was commissioned by BMT Cordah on behalf of Shetland Islands Council and Viking Energy Partnership to undertake an archaeological assessment of the proposed Viking Wind Farm in Shetland to further inform the planning process.

The proposed development will include the construction of a wind farm, comprising 150 turbines and a road system consisting of operational tracks, borrow pits and double and single width tracks.

Cartographic and bibliographic sources indicate that the area of the proposed wind farm has been subject to extensive human activity from prehistoric times to the present. Circa 89 sites have been identified within the vicinity of the application area. The majority of these sites date to the post-medieval crofting period and comprise the remains of upstanding farm buildings, houses and mills. Several sites potentially dating to the prehistoric period have been located within the proposed development area and include standing stones, cairns and a possible Bronze Age settlement. A number of prehistoric findspots are also known within the proposed development area; with a number of stone axes, knives and adzes being recovered, primarily from the Kergord and Delting Quadrants.

Included in the 89 sites identified in the immediate vicinity of the application area are one Scheduled Ancient Monument and one Category B Listed Building. Hill of Dale chambered cairn is located within the Delting Quadrant. Grobsness Haa, an 18th century Category B Listed Building, is located within the Kergord quadrant.

Assessment of the direct impacts upon sites known within the proposed development area has been based upon the turbine and access track layout provided by the client. The layout is subject to micro-siting by up to 50m (or 100m in exceptional cases) during construction in order to avoid causing environmental impacts. The assessment has indicated that three sites are at risk of being disturbed given their location within 10 metres of access tracks and turbine bases. Furthermore, it should be noted that plant moving around the site during the construction phase has the potential to damage known remains of archaeological significance. In compliance with national and local planning policies, it is advised that mitigation measures should include complete avoidance of known archaeological sites, including Laxo Burn. By ensuring that turbines and access tracks are placed to avoid known archaeological sites these can remain *in situ*, which is the current preferred mitigation response. In addition, known archaeological sites should be fenced off prior to plant entering the sites to ensure that these remains are not damaged during the construction phase. If in any instance of disturbance of a known site cannot be avoided then an appropriate mitigation strategy will need to be established in conjunction with the council's archaeological advisor. Such mitigation may include archaeological excavation and would be required to ensure that the site is *preserved by record*. Depending on the result of any such excavation, the developer may be required to commission post-excavation analyses and publication of findings to satisfy planning conditions.

Given the scale of known archaeological sites within and surrounding the application area there is a possibility of encountering hitherto unknown remains, which may survive as

subsurface features, during groundbreaking works associated with the development. It is advised that an archaeological watching brief be required during ground breaking works with the aim of identifying and recording any hitherto unknown remains prior to their destruction. Where more substantial remains are uncovered during a watching brief further mitigation would have to be agreed with the council's archaeological advisor.

Potential visual impacts on the setting of Scheduled Ancient Monuments and Listed Buildings and other protected sites within 10 km of the proposed wind farm boundary have been assessed as part of this report. Assessments have been based upon a Zone of Theoretical Visibility (ZTV) as established by turbine placement, height and the surrounding topography. Each protected site incurring a potential impact, as per the ZTV, was visited with an aim of assessing the cultural heritage significance and quality of views between the monuments and the wind farm. Factors such as intervening vegetation, built structures and previously incurred impacts to setting were also noted during these visits. A total of 134 Scheduled Ancient Monuments, 91 Listed Buildings and one Inventory Designed Landscape were located within the 10 km search area. The majority of visually affected sites will sustain an impact of *Negligible* or *Minor* significance. However, 12 sites will sustain an impact of *Moderate* significance and 13 of *Major* significance. The impact upon the Inventory Designed Landscape at Lunna House is likely to be *Minor-Moderate*.

13.2 SCOPE OF ASSESSMENT

The aim of the study was to identify elements of archaeological and architectural heritage value that may be impacted upon by the proposed Viking Wind Farm. The evidence presented and the conclusions reached provide a comprehensive basis for further discussion and decisions regarding the future of the site and for the formulation of a mitigation strategy.

The objectives undertaken in pursuing the study were focused on assessing the archaeological and architectural heritage significance of the area which would be impacted by the development of Viking Wind Farm, Shetland by examining a variety of evidence for upstanding and buried remains of archaeological and architectural heritage interest within 1 km and Scheduled Ancient Monuments, Listed Buildings, Conservation Areas and Historic Gardens and Designed Landscapes within 10 km of the development area. A full environmental impact assessment based upon the archaeological and architectural value thus identified, and the nature and scale of the proposed development is provided. Advice is offered on the extent and nature of mitigation that may be required.

13.2.1 Overview

The scope and method of this impact assessment is guided by *PAN 58 Environmental Impact Assessment* (1999). The recommended mitigation complies with the national planning policies on heritage, as published in *SPP23 (2008)*, *SHEP (2008)* and *PAN42 (1994)* and with local planning policies outlined in structure and local plans.

The aim of this study is to assess the significance of archaeology and cultural heritage within and surrounding the wind farm and the potential impacts on it, in order to plan appropriate mitigation, if necessary, in response to the wind farm proposal.

The objectives of this assessment are to:

- Gather data for all known archaeological and cultural heritage features within 1 km of the wind farm boundaries and all protected sites within 10 km;
- rate the archaeological or cultural heritage significance of the identified features;
- assess the likelihood of other previously unknown remains surviving unrecorded in the study area;
- identify appropriate mitigation methods;
- assess the magnitude of impact and significance of impact of the proposed development upon identified features; and
- recommend whether any further archaeological research is required.

The mitigation strategies recommended are formulated based upon the requirements of SPP23 (Scottish Government 2008), SHEP (Historic Scotland 2008), PAN 42 (SOEnd 1994) and AM & AAA (1979).

AOC Archaeology Group conforms to the standards of professional conduct outlined in the Institute for Archaeologists' (IfA) 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.

AOC Archaeology Group is a *Registered Archaeological Organisation* of the IfA. This status ensures that there is regular monitoring and approval by external peers of our internal systems, standards and skills development

13.3 STATUTORY AND POLICY CONTEXT

13.3.1 Government and Local Planning Policies

(a) Legislation and National Planning Policy Guidelines

The statutory framework for heritage in Scotland consists primarily of the Ancient Monuments and Archaeological Areas Act 1979 and is outlined in the Town and Country Planning (Scotland) Act 1997, as amended in the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.

The implications of *The Ancient Monuments and Archaeological Areas Act 1979* with regard to local government planning policy are described within the Scottish Planning Policy (SPP), Scottish Historic Environment Policy (SHEP) and Planning Advice Notes (PAN) for Scotland. Consent of the Scottish Ministers is required before any works are carried out which would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding or covering up a Scheduled Ancient Monument (SAM). Further, effects upon the setting of a SAM are a material consideration in deciding whether to grant or refuse planning permission. SPP 23 '*Planning and the Historic Environment*', SHEP '*Scottish Historic Environment Policy*' and PAN42 '*Archaeology - the Planning Process and Scheduled Ancient Monument Procedures*'

(SOEnD 1994a) deal specifically with planning policy in relation to heritage. The planning guidance expresses a general presumption in favour of preserving heritage remains *in situ*. Their ‘preservation by record’ (i.e. excavation and recording, followed by analysis and publication, by qualified archaeologists) is a less desirable alternative.

SHEP (Historic Scotland 2008) sets out the Scottish Executive’s policy for the sustainable management of the historic environment. Key principles of the policy note that ‘there should be a presumption in favour of preservation of individual historic assets and also the pattern of the wider historic environment; no historic asset should be lost or radically changed without adequate consideration of its significance and of all the means available to manage and conserve it’ (1.14.b).

Under the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 special attention is paid by planning authorities to the desirability of preserving or enhancing the character or appearance of conservation areas. When considering planning permission for developments that might affect listed buildings or their settings, planning authorities will have a special regard to the desirability of preserving the buildings and their settings and features of special architectural or historic interest. In the context of the Act ‘preserving’ in relation to a building means preserving in its existing state or subject only to alterations that do not cause serious detriment to its character. Historic Scotland’s Memorandum of Guidance on listed buildings and conservation areas (Historic Scotland 1998, 201), which is to be replaced in 2009, notes that developments at some distance from a listed building can have both physical and visual impacts. The Memorandum notes the duty of planning authorities to advertise developments that might affect the setting of a listed building and that ‘setting’, though not defined, is not to be interpreted narrowly. Developments in a rural location outwith the building’s curtilage are regarded as affecting the setting where the development will be seen ‘in any principal view of or from the listed building, or affect in any way the main approaches to it.’ Also, ‘development which will block distant views of important architectural landmarks may...also fall into this category’ (Historic Scotland 1998, 202). With regard to historic gardens and designed landscapes both SPP 23 (section 46) and SHEP (Historic Scotland 2008 3.63) note that the effects of development on these should be a ‘material consideration in the determination of a planning application’.

(b) **Shetland Structure Plan**

The Shetland Structure Plan 2001 – 2016 (approved 2001) contains some general policies relating to cultural heritage, as follows:

‘There will be a presumption against any development proposal that would destroy or have any adverse effect on the following built heritage resources of Shetland.

- *Scheduled Ancient Monuments and their setting;*

- *Buildings and the settings of buildings listed as being of Special Architectural or Historic interest and designated Conservation Areas;*
- *Archaeological sites and their setting;*
- *Historic gardens and designed landscapes*
- *Other sites and areas of significant archaeological, architectural or historic interest.*

*The Shetland Local Plan will include detailed policies for their protection and enhancement'. **Policy SP BE1***

*'When preservation in situ of scheduled and other nationally, regionally and locally important archaeological remains has been proven to be impossible and where no alternative site is available, then sites will require to be recorded, surveyed and/or excavated prior to development. The Council will take advice from the Shetland Archaeologist and/or other appropriate bodies regarding the most appropriate course of action. In such cases the financing of the work will normally fall on the developer, in accordance with national policy'. **Policy SP BE2***

(c) **Shetland Local Plan**

The Local Plan closely mirrors the structure plan and also contains Community Council Area Statements which contain detailed proposals, recommendations and development opportunities for the protection and enhancement of the built heritage. The policies relating to cultural heritage in *The Shetland Local Plan (June 2004)* are as follows:

"The Council will assess applications for planning permission for their impact on the environment. Applications for planning permission for the extraction and exploitation of natural resources will normally be permitted provided the proposal, by virtue of its location, scale or duration of operation, would not have an unacceptably significant adverse effect on the natural or built environment. When assessing development proposals, the following general considerations will be taken into account, namely:

- a) likely impacts, including cumulative impacts, on amenity and the environment as a whole;*
- b) effects on nearby residents and the buildings they occupy;*
- c) landscape character and visual amenity;*
- d) water resources and the marine environment (particularly pollution of controlled waters by any contaminants associated with the land); biodiversity; archaeology and other land uses in the area;*
- e) transport considerations, including the type and volume of traffic, including construction traffic, likely to be generated by the proposal;*
- f) current Government guidance, other policies in the Shetland Structure and Local Plan and particularly those relating to the proposed type of development.*

In particular the Council will refuse development proposals that would have a significant adverse effect on the integrity or character, as appropriate, of the following designated sites:

- g) Possible, candidate or designated Special Areas of Conservation, potential or classified Special Protection Areas, Ramsar sites, Sites of Special Scientific Interest, National Nature Reserves and Marine Consultation Areas and the National Scenic Area;
- h) Listed Buildings;
- i) Conservation Areas;
- j) Scheduled Ancient Monuments;
- k) Historic gardens or designed landscapes.” **Policy LP NE10**

(d) **Planning considerations pertaining to the site**

The Local Planning Authority is advised on all archaeological matters by Shetland Amenity Trust.

Any works that affect the fabric or setting of a Listed Building can only be undertaken once Listed Building Consent has been granted by the Local Authority. The *visual setting* of Listed Buildings is also a competent planning matter. Demolition or alteration of the appearance of the existing buildings on the development site, or the construction of turbines and access tracks, could have visual impacts upon the surrounding protected buildings and monuments. The policy that the setting of Listed Buildings should be an issue in development control is outlined in *Scottish Historic Environment Policy*:

“in assessing an application for listed building consent, the planning authority is required to have special regard to the desirability of preserving the building, or its setting, or any features of special architectural or historic interest which it possesses.” (SHEP, Historic Scotland 2008, Section 3.33).

A new development must not impact upon the area of a scheduled ancient monument without the prior formal consent of Historic Scotland. The types of impact that can be caused to a Scheduled Ancient Monument by a development also include visual impacts, i.e. where the setting of a monument is disturbed by an inappropriate or unsympathetic design or layout. This issue is outlined in *Scottish Planning Policy*:

“Scheduled monuments are of national importance and they should be preserved in situ and within an appropriate setting. While the scheduled monument consent process is separate from the statutory planning process, where works requiring planning permission affect a scheduled monument, the protection of the monument and its setting are material considerations in the planning process.” (SPP 23 Section 43).

13.4 METHODOLOGY

13.4.1 Baseline assessment

The baseline assessment comprised a desk-based assessment of available archives, including consultation of aerial photographs, and a field walkover survey of the entire site. Sites and monuments considered to be of cultural heritage interest have each been assigned a Site No. unique to this assessment. The Site Gazetteer in *Appendix 13.1* lists these in numerical order, along with data detailing their National Grid Reference to eight figures and status, and a description of the nature and scale of the sites. Each Site No. is also plotted on a location map (Figures 13.1-13.5).

13.4.2 Desk-based assessment

The following data sources were consulted during the preparation of this assessment:

- Historic Scotland (Scheduled ancient monuments, listed buildings, and Designed Landscapes)
- The Shetland Amenity Trust (Local Sites and Monuments Record Data)
- The Royal Commission on the Ancient and Historical Monuments of Scotland (the National Monuments Record of Scotland; the Ordnance Survey Name Book, the Aerial Photographic Collection, various publications)
- The National Map Library (early Ordnance Survey maps; early cartographic records of the area)
- National Archives of Scotland
- Shetland Archives, Lerwick
- The Shetland Field Studies Group
- Nesting Local History Society.

Aerial Photographs held by the National Monuments Record of Scotland (NMRS) and the Sites and Monuments Record (SMR) were consulted during the assessment, with the aim of investigating whether the archaeological remains in this landscape could be more extensive than the recorded data indicates. Additional aerial photographs of the site taken during an oil reconnaissance survey in 1975 were also consulted in the SMR. Peat erosion scars identified during aerial photographic consultation were recorded and targeted during field survey to assess peat depth and evidence for archaeology. Photographs consulted are identified Section 13.10.3 of this report.

The historical maps consulted during this assessment range in date from the 1600's (Blau) to the 1900's (Ordnance Survey). They provide useful data about changes in land-use, boundaries, buildings and place names over the centuries. The reference details for all publications, historic maps and aerial photographs consulted during this assessment can be found in Section 13.10.2 at the end of the chapter.

13.4.3 Field survey techniques

The walkover survey, the route of which is indicated on Figure 13.6, of the proposed wind farm was undertaken in three main stages:

A walkover survey of the Collafirth quadrant and the Nesting quadrant was undertaken from 22nd to 27th June 2005. A walkover survey of the Kergord quadrant and Delting quadrant was undertaken from 26th September 2005 to 6th October 2005. A walkover survey of the access tracks and the visual impact assessment of scheduled monuments and listed buildings was carried out from 2nd to 11th September 2008. The aim of these walkover surveys was to identify any cultural heritage remains on site, and to record any such remains encountered. All archaeological sites identified were assessed in the field for their survival, extent, significance and relationship to other sites. A note of the extent and depth of peat erosion on the tops of hills and the location and depth of peat erosion scars was noted. All individual features were recorded, photographed and sketched. All features identified were marked on a plan keyed by means of grid references to Ordnance Survey Mapping. A digital photographic record was kept.

To ensure even coverage of the proposed area, the site was systematically surveyed by walking transects at a spacing of between 50-100m. The route of the survey was agreed with Shetland Amenity Trust¹ at the start and completion of first two surveys to ensure that the coverage provided by the survey was satisfactory. Where possible the natural topography of the site was exploited to ensure that a maximum area to either side of the path of each transect was visible. GPS was used to note and confirm the position of each transect and to note the position of any surviving features on the site. This survey addressed all areas highlighted in yellow on Figures 13.1-13.4. The access tracks were surveyed using a handheld GPS².

Weather conditions were good for the majority of the survey of the Collafirth and Nesting quadrants. Overcast but bright skies contributed to high visibility. Conditions were blustery and several short showers were experienced during which visibility was poor. Survey conditions for the Kergord and Delting quadrants were not ideal being particularly wet and blustery and at times visibility was down to less than 100m. During any mist and rain showers, transects were walked at closer intervals to maximise visibility and ensure full coverage. On days when visibility was particularly poor, care was taken to ensure that all areas were covered and the survey was concentrated on the lower valleys and coastal areas where the impact of cloud on visibility was less severe. Weather conditions were good for the majority of the survey of the access tracks and the visual impact assessment of the scheduled monuments and listed buildings. Mostly clear skies contributed to high visibility. An extremely heavy thunderstorm hindered the survey during the afternoon of 2nd September and during the final two days of the survey (10th & 11th September 2008) the

¹ L. Fouracre of AOC Archaeology Group discussed the route of the initial two surveys with C. Christiansen of Shetland Amenity Trust prior to the surveys being undertaken. Areas to survey were agreed as were the size of survey transects. Following the surveys L. Fouracre conveyed to C. Christiansen the results of the survey and indicate the areas walked to ensure that SAT were content with coverage of the Survey.

J. Marttila of AOC Archaeology Group met with V. Turner of Shetland Amenity Trust while carrying out the walkover survey of access tracks and turbine locations in September 2008. During this meeting SAT were shown the plan of the track and turbine to ensure they were aware of areas being surveyed.

² Handheld GPS used by AOC Archaeology Group during the walkover surveys displayed an average accuracy of circa 6 metres, and was never more than 16 metres, during the course of the walkover surveys.

weather turned overcast, wet and very blustery, as a result visibility was as low as circa 40 metres on these days. However care was taken to ensure that all important sight lines were assessed and recorded.

13.4.4 Impact evaluation

Two methods are applied for impact evaluation, the first relating to direct impacts (i.e. physical construction related effects), the second to indirect impacts (i.e. impacts on the setting of cultural heritage sites). The method for evaluating direct impacts of the proposed wind farm on cultural heritage is described below.

(a) Direct impacts

Receptor sensitivity

Sensitivity encompasses a measure of the site’s value. Protective designations are generally assigned based upon consideration of factors such as age, rarity, condition, site context, architectural design and historical associations. The rating of sensitivity of the monuments within the assessment area was guided by criteria used by Historic Scotland for scheduling ancient monuments and classifying listed buildings (SHEP 2008). The rating adopted in the current assessment attempts to extend this rationale to non-designated sites. The methodology used regards all heritage or archaeological remains as being sensitive to some degree and is summarised in Table 13.1. In such studies we are guided by local regional and national heritage policy as outlined in Section 13.3.1 above and international heritage policy (e.g. various charters including the Valetta Convention 1992 and the European Landscape Convention 2000), which defines sites and monuments as potentially comprising a very wide variety of heritage remains. Note that in some cases a monument that does not have a protective designation assigned to it could nonetheless still be rated in this assessment as having the same sensitivity as another monument which is protected. This is because the selection of buildings and sites/monuments for Listing and Scheduling is an ongoing activity. Criteria for judging archaeological sensitivity are gradually evolving, with an increasing trend towards including more recent types of structures. In some cases, important buildings or monuments may have been accidentally overlooked during Listing/Scheduling, or could now be judged worthy of protecting, whereas they were not previously. The number of new schedulings of monuments greatly outnumbers deschedulings. While a limited number of monuments are descheduled over time, such monuments may be granted ‘Listed’ status rather than having all protection removed.

The criteria used to rate archaeological and architectural heritage sensitivity in the proposed development area are presented in Table 13.1 below.

Table 13.1 Criteria for establishing relative cultural value

Cultural Value	Criteria
International and National	World Heritage Sites <i>or</i> Iconic Sites and Monuments; <i>or</i> Scheduled Ancient Monuments (Actual and Potential);

	<p><i>or</i> Category A Listed Buildings; <i>or</i> Remains of national or international importance, or fine, little-altered examples of some particular period, style or type</p>
Regional	<p>Category B Listed Buildings <i>or</i> Remains of regional or more than local importance, or major examples of some period, style or type, which may have been altered; Remains of national importance that have been partially damaged.</p>
Local	<p>Category C or C(S) Listed Buildings <i>or</i> Remains of local importance, lesser examples of any period, style or type, as originally constructed or altered, and simple, traditional sites, which group well with other significant remains, or are part of a planned group such as an estate or an industrial complex; Cropmarks of indeterminate origin; Remains of regional importance that have been partially damaged or remains of national importance that have been largely damaged.</p>
Negligible	<p>Relatively numerous types of remains, of some local importance; findspots of artefacts that have no definite archaeological remains known in their context. Remains of local importance that have been largely damaged; Isolated findspots; Undesignated structures</p>

The magnitude of the physical impact upon monuments caused by the proposed wind farm development has been rated using the classifications and criteria outlined in Table 13.2 below.

Table 13.2 Criteria for classifying magnitude of physical impact

Physical impact	Criteria
High	<p>Major loss of information content resulting from total or large-scale removal of deposits from a site whether or not the site is associated with a monument. Major alteration of a monument’s baseline condition. Any physical alteration to a Scheduled Ancient Monument.</p>

	Any alteration to a Category A Listed Buildings, massive alterations to a Category B or Category C Listed Building
Medium	Moderate loss of information content resulting from material alteration of the baseline conditions by removal of part of a site Whether or not the site is associated with a monument. Slight alteration of a monument’s baseline condition
Low	Minor detectable impacts leading to the loss of information content. Minor alterations to the baseline condition of a monument.
Negligible	Very slight or barely measurable loss of information content; Loss of a small percentage of the area of a site’s peripheral deposits. Very slight and reversible alterations to a monument.
None	No physical impact anticipated.

The predicted significance of impact upon each monument is determined with professional judgement by considering its relative cultural value in conjunction with the magnitude of impact predicted on it. The method of deriving the significance of impact classifications is shown in Table 13.3 below.

Table 13.3 Method of rating significance of direct impact upon archaeological/ architectural heritage sites by the proposed development

Magnitude of physical impact	Cultural Value				
	Negligible	Local	Regional	National	International
High	Minor-Moderate	Moderate	Moderate-Major	Major	Extreme
Medium	Minor	Minor-Moderate	Moderate	Moderate-Major	Major
Low	Negligible	Minor	Minor-Moderate	Moderate	Moderate-Major
Marginal	Negligible	Negligible	Minor	Minor-Moderate	Moderate
None	None	None	None	None	None

(b) **Indirect impacts**

The following significance criteria were used in determining the visual impacts on the setting of monuments by the proposed wind farm. These factors have been assessed in a qualitative manner for each relevant monument, based on field visits, the creation and examination of ZTV maps, and consultation of various other recorded and archived data.

Advice on the assessment of impact on the setting of historic environment resources was received from Historic Scotland.

Receptor sensitivity

Development type

The type of development may indicate whether it is likely to be a temporary or a permanent feature on the landscape. Temporary developments could be regarded as less damaging to the setting of monuments, since the visual impact will eventually be removed. In the case of this project and type of development, a wind farm is common to each of the monuments. The visual effects are likely to prevail for up to 25 years, with probable eventual decommissioning.

Distance from development

The greater the distance the monument is from the proposed development site, the more diminished the visual effects will be. There are various guidelines and opinions regarding the distances at which wind turbines may be considered to act as a visually intrusive element in the landscape (summarised in SNH 2002 '*Visual Assessment of Windfarms: Best Practice*'), although some of these recommendations are now out of date as they were based on smaller turbines. The Scottish Executive (*PAN 45, 2002*) issued the following guidance on visibility of turbines with a tower height of greater than 70 m and rotor diameters of greater than 80 m:

Table 13.4 Distance / prominence relationship

Distance	Perception
<2 km	Likely to be a prominent feature
2-5 km	Relatively prominent
5-15 km	Only prominent in clear visibility – seen as part of the wider landscape
15-30 km	Only seen in very clear visibility – a minor element in the landscape

The British Wind Energy Association (BWEA) stated that '*significant visual effects of wind turbines are only experienced within 5km*'. Other recent research on the visual effects of 63m high wind turbines by Bishop found that '*visual impact drops rapidly at approximately 4 km and is <10% at 6 km in clear air. Visual impact in light haze is not greatly different. A rapid decrease in visual impact begins at under 4km and is <10% at 5 km*' (in SNH 2002). As the size of turbines being built is progressively increasing, there are no up-to-date guidelines about the effects on cultural heritage assets of turbines 100m or more in height.

Scale and layout of development

The size and number of turbines, and their layout (i.e. how spread or clustered they are) has an effect on the level of visual impact. The height of the turbines is important, as larger/higher turbines can be seen from a greater distance. These factors, in addition to the distance of a monument from the wind farm, determine the scale of the development from the viewpoint of the monument. The number of turbines visible from a monument is determined partly by topography. The visibility of turbines from each monument based on

topography can be predicted by consulting a ZTV ('Zones of Theoretical Visibility') map and/or wire frame models.

Visual attenuation

This refers to any measures that will be made to visually attenuate the development in the landscape, e.g. by the use of local/traditional materials for substations or other necessary buildings, and through the use of colours which blend in with the surroundings.

Backdrop

The backdrop of the wind farm, when viewed from each monument, is also a factor in determining how visible the turbines will be. In many cases this will be sky, due to the general elevation of wind farms, however in some cases the backdrop might be a vegetated slope or other landform.

Complexity of landscape

The more visually complex a landscape is, the less the new development will intrude into it. This is because where a landscape is visually complex, the eye will be distracted by other features and will not focus exclusively on the wind turbines. Visual complexity describes the extent to which a landscape varies visually and the extent to which there are various land types, land uses, and built features producing variety in the landscape.

Visual obstacles

This refers to the existence of any features (e.g. tree belts, landscaping or built features) that could partially or wholly obscure the development from view, whether already existing or to be purpose-built as part of the development. However, it should be noted that the introduction of new elements to screen a development could introduce new sets of issues and planning conditions.

Cultural heritage significance

This would be decided using the criteria as previously illustrated in Table 13.1.

Monument morphology

The morphology or form of a monument is a relevant factor. The proposed development might not affect the setting of *all* of a monument, i.e. there may be parts of the monument from which the development cannot be seen. This might occur where a monument has an internal space that can be entered by the visitor, thus shutting out views to the new development (e.g. a building or a chambered tomb). In contrast, some other monuments can only be experienced externally (e.g. a standing stone) and are therefore more open to the effects of visual impact. For buried remains (e.g. a crop mark site), the issue of visual impact could be considered less important, since the monument is not visible at ground level anyway.

Monument amenity value

The value of a monument's amenity or use refers to its level of public use, who uses it, how it is used, how frequently it is visited, and how its use might be expected to change in the future. This could also extend to the frequency with which it is photographed by its users,

since the visual impact of a development would also be manifested in photographic portrayals of the monument. The amenity value or public use is affected by a variety of factors including, for example, geographical remoteness, ease of physical access, monument type, state of survival, and the existence of any promotional or interpretive aids.

Significance of original/former monument setting

The significance of the original setting refers to the original perceived importance of a monument's setting to its builders and users. Often monuments inter-acted with other contemporary elements in the landscape. In some cases, visual setting was thus a significant element in the siting of monuments. Generally the role of site and setting was potentially of high importance in the case of ritual monuments (e.g. barrow cemeteries), strategic and defensive monuments, and monuments designed to convey power or high status (e.g. hillforts and castles). However the visual setting of farms and of industrial buildings was usually less important due to their primary economic functions (although their location would be an important factor in terms of economics and proximity to natural resources). Similarly commercial premises were sited according to demographics and economics, with visual setting being less relevant. Estimation of the significance of original setting should include consideration of views both to and from the monument, as well as the function of the monument.

Current value of monument setting (including cumulative impacts)

The current character of a monument's setting is of relevance, since alterations to the setting may already have severed or impaired its relationship to the historical landscape. For example, if the area around a monument has been planted with forestry, its setting could be regarded as being of reduced importance. This would particularly apply to monument types for which intervisibility was a key feature in their original use, since the sightlines between them and other related components in the context of their historical landscape may already been compromised due to afforestation. Other modern intrusive elements (e.g. masts) may have been introduced into the landscape. Cumulative effects might apply where another wind farm is already visible from a monument.

Criteria for magnitude of impact

The pro-forma, or prompt sheet, contained in Appendix 13.2 was used to assess the various factors of significance at each monument. The predicted significance of visual impact upon Scheduled Ancient Monuments and Listed Buildings was determined by considering its relative visual sensitivity in conjunction with the magnitude of visual impact predicted on it. The method of classifying the magnitude of visual impact is shown in Table 13.5 below.

Table 13.5 Criteria for classifying magnitude of visual impact

Visual impact	Criteria
High	Direct and substantial visual impact on a significant sightline to or from a ritual monument or prominent fort; Major alteration to the penumbral or close settings of a Scheduled Ancient Monument; Major visual imposition within a Cultural Landscape; Major visual imposition within or affecting and Iconic Site or

	Monument
Medium	Oblique visual impact on an axis adjacent to a significant sightline to or from a ritual monument but where the significant sightline of the monument is not obscured. Glacis of a prominent fort (based on the proportion of the glacis that would be obscured). Significant alteration to the setting of a SAM outwith its penumbral setting or significant alteration to the setting of a Category A, B or C Listed Building beyond its curtilage. Significant but not major visual imposition within a Cultural Landscape.
Low	Peripheral visual impact on a significant sightline to or from a ritual monument. Insignificant alteration to the setting of a SAM outwith its penumbral setting or insignificant alteration to the setting of a Category A, B or C Listed Building beyond its curtilage. Minor visual imposition with a Cultural Landscape
Negligible	All other visual impacts
None	No intervisibility.

The predicted significance of visual impact upon each monument was determined by considering its archaeological significance in conjunction with the magnitude of visual impact predicted on it. The method of deriving the significance of impact classifications is shown in Table 13.6 below.

Table 13.6 Significance of the effects of visual impacts on the cultural value of monuments

Cultural Value				
Magnitude of Visual Impact	Negligible	Local	Regional	International or National
High	Minor	Minor	Moderate	Major
Medium	Negligible	Minor	Minor	Moderate
Low	None/Negligible	Negligible	Minor	Minor
Negligible	None	None	Negligible	Minor
The impacts shown in bold are ‘significant’ in terms of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000				

13.4.5 Limitations of assessment

This assessment can only address the sensitivity of the proposed development upon known receptors. The extent of damage and significance of impact upon any buried archaeological remains that are currently unknown cannot be assessed beyond recognition of their possible existence.

It should also be noted that no specific field study of the visual interlinking between the subjects was attempted during this assessment, and that, as is the case for the landscape and visual assessment, there is reliance upon computer generated models.

Only relevant sites within a catchment area of 10 km of the proposed wind farm area boundary were considered in discussing the potential impacts on setting.

Some problems with aerial photograph interpretation are created by the fact that on parts of the site there are few fixed points on the hill that can be used to assist the location of the remains in the photographs and, furthermore, much of the vertical aerial photography available is small-scale. In some cases the archaeological remains recorded by the NMRS were not visible or could not be located in the photographs. Aerial photographic coverage of Shetland remains somewhat patchy and thus some of the photographic collections consulted did not have complete coverage of all areas.

13.5 BASELINE CONDITIONS

13.5.1 Context

Sites located in the vicinity of the application area are indicated on Figures 13.1-13.4. The majority of these sites are upstanding remains associated with the post-medieval crofting period. Seven possible prehistoric sites were identified during the walkover survey in addition to numerous field systems in the lower lying coastal areas which form part of a wider multi-period relict landscape. The wider study area is rich in both prehistoric and historic archaeological remains. Within Shetland the quality and preservation of archaeological monuments of almost all types is remarkable. The absence of population pressure and mechanised land-use has resulted in a highly visible archaeological record. Characteristic of the Shetland region in the prehistoric period are a range of monument types including burial cairns, standing stones, burnt mounds, brochs and prehistoric homesteads associated with field systems and clearance heaps. Pictish and Norse influence during the medieval period is demonstrated by evidence of Pictish carvings and Viking burials within the assessment area. The remains of post-medieval and pre-Clearance society abound throughout the region and attest to the former thriving agricultural and fishing community. Individual sites and site types are discussed below in Section 13.5.3 Historical and Archaeological Background. Where sites are located within the proposed application area, the quadrant in which they are located is noted in the text.

The majority of the proposed wind farm site is on undeveloped land which has been used in recent years for pastoral farming. Eastern limits and the coastal margins of the Kergord quadrant are occupied by active farmsteads and several unused farmsteads. Some archaeological survey has been undertaken within the margins of each of the four quadrants, however there has not as yet been a systematic archaeological survey of the area. It is possible that any groundwork will disturb previously unknown archaeology.

13.5.2 Designations

There is one listed building (**Site 198**) located in the immediate vicinity of the application area (see Appendix 13.1). This is located at Grobsness within the Kergord quadrant. There are 91 listed buildings in the broader assessment area i.e. within a 10 km radius. There are three Category A listed buildings **Site 299** (Tresta, Traders House), **Site 401** (Haa of Sand) and **Site 402** (Haa of Sand, Cottage) in addition to **Sites 90-98** which have a Category A

Group Listing and form part of the Inventory designed landscape at Lunna House. Two sites, Mitchells of Westshor Burial Aisle (**Site 426**) and Symbister Pier House (**Site 439**) are Scheduled Ancient Monuments in as well as listed buildings. Category A listed buildings and Scheduled Ancient Monuments are considered to be of national importance thus the possible visual impacts upon the settings of such structures must be carefully considered.

There is one Scheduled Ancient Monument (**Site 83**) located within the Delting quadrant of the application area. There are no Scheduled Ancient Monuments located in the Collafirth, Nesting or Kergord quadrants. However, 134 Scheduled Ancient Monuments in total are located within a distance 10 km of the proposed turbine stances. These comprise the remains of prehistoric settlement sites dating from the Neolithic to Iron Age; burnt mounds chambered cairns, heel-shaped cairns, brochs, early medieval religious structures and Second World War defence structures.

There is one designed landscape within 5 km of the proposed development site. This is located within the grounds of Lunna House north-east of the proposed wind-farm.

13.5.3 Historical and Archaeological Background

(a) Mesolithic (8500 – 4000 BC)

Sites of Mesolithic activity in Scotland are normally identified through the discovery of buried stone tools or scatters of stone debris from their manufacture. Isolated finds of Mesolithic flints have been discovered as far north as Caithness and a small number of tanged points have been found on Orkney (Saville 2000: 94). Until recently however, no direct evidence of Mesolithic activity had been found in Shetland although changes in vegetation during the period 7500 to 5400 BP (before present) had been interpreted as a consequence of the introduction of grazing animals (Edwards, 1996). However, the preliminary evaluation of an oyster midden exposed by coastal erosion at West Voe, Shetland has provided the first direct evidence for Mesolithic human activity in the Northern Isles of Scotland. An overlying midden, composed of cockles, has also yielded an early date and may be associated with a structure (Melton and Nicholson, 2004). It is thus probable that Shetland was occupied in the Mesolithic. Consequently it is possible that parts of the proposed development area were used and settled by Mesolithic peoples.

(b) Neolithic (4000-2000BC)

Although evidence for Neolithic monumentality is present throughout Scotland, evidence of settlement and agricultural practices is scarce. Consequently, the remarkable evidence for Neolithic settlement found in Shetland provides a valuable insight into prehistoric agricultural practices. Evidence for a highly organised system of agriculture exists in the form of substantial walls which run across the country for long distances, cutting the countryside into large units, which are then subdivided by lesser field boundaries (Fojut, 1993). The earliest dates for occupation evidence are from a Neolithic burial at Sumburgh from the 4th millennium BC although settlement would have begun before this. It is important to note that during the Neolithic the climate of Shetland was milder and sea level was much lower, so there was more fertile ground around the shores than there is now (Tabraham, 1993). The earliest pottery found in Shetland has a style clearly related to that found on Orkney and the mainland but with a variation that makes it easily distinguishable to that made in neighbouring areas. The first monuments built in the landscape are chambered burial cairns and henges (circular ritual enclosures), which date from the early Neolithic. Although there are no stone circles, Shetland has quite a number of isolated

monoliths of indeterminate antiquity which are difficult to date without some excavation of their context but examples in the assessment area are referred to within this Neolithic section.

The precise function of standing stones is unclear, pairs of standing stones may be aligned on astronomical events or landscape features and single stones may commemorate a particular event. In the absence of excavation the level of potential information they may contain is unknown. Standing stones are however, visually appealing and may be of high aesthetic value. A typical example of a standing stone within the assessment area is Skellister (**Site 126**); it appears to have been quarried from the adjacent hillside and is packed at the base. There are three sites within the proposed development area that possibly survive as evidence for standing stones. **Site 177** in the Delting quadrant is known as the Ludovic stone. It is a small standing boundary stone described in the Ordnance Survey Name Book (1878) as taking in its name from Ludovic Dunbar, a former minister. At **Site 352** is a small standing stone approximately 0.7m in height but clearly packed at the base. A further standing stone was identified during the most recent walkover survey at Gro Stane (**Site 372**). This stone stands approximately 1.4 m in height and is located approximately 300 m southwest of a possible prehistoric settlement. A further two standing stones are located outwith the proposed development area at Gravlaba in close proximity to a chambered Neolithic structure (**Site 309**). The stones are rugged and undressed but packed at the base, one has now fallen. Individually these stones are in no way remarkable, but the occurrence of a pair is note worthy and has parallels elsewhere in Shetland.

Shetland has a large number of chambered cairns, mostly small and ruinous. They are often built in conspicuous places on hills, or skylines. The most common form of chambered cairn is the heel-shaped cairn and is unique to Shetland with only a very few examples elsewhere in the north (Turner 1998). These cairns are oval in plan and the roof of the main chamber is generally formed by corbelling, with lintelled alcoves and entrance passages. One known chambered cairn survives on the proposed development site on the summit of the Hill of Dale within the Delting quadrant (**Site 83**) (Henshall 1963). An additional previously unrecorded cairn was discovered at the edge of Truggles Water in the Kergord quadrant during the walkover survey (**Site 346**). This cairn appears to have been robbed to create a shelter on its southwest side. What appears to be a lintelled entrance passage or alcove is visible in the northeast and has traces of a masonry wall surviving up to 3 courses and leading into the possible cairn. Other examples of chambered cairns can be found located within the wider assessment area at **Sites 109, 140, 173, 291, 301, 306, 314, 322, 327-28, 367-68, 373, 376-77, 385-86, 389, 392, 396, 400, 403, 409-10 and 436**.

There are also a number of damaged or ruinous cairns within the assessment area which may originally have been quite large and of a distinctive form but have been almost totally robbed-out (**Sites 24, 27, 105, 107, 99, 141, 378, 382-83, 388, 397, 428 & 444**). **Site 24** is located less than 100m south of the proposed development site but has been so denuded that its original form remains elusive. Similarly a possible cairn is located at **Site 105** although it may also represent the collapsed remains of a settlement site. Similarly the cairn located at Hard Knowe (**Site 141**) has collapsed and the chambered cairn at the East Hill of Bellister (**Site 99**) is now very much overgrown. A long cairn is located at Cattapund Knowe (**Site 391**) has also been greatly disturbed and excepting a group of large stones at the northeast end, it is unclear whether any of the other stones remain *in situ* (Henshall 1963; RCAHMS 1946).

The most characteristic tool-type of the Neolithic is the polished stone axe, similar to those found at **Site 183** and **Site 184** within the Delting quadrant. A distinct artefact unique to Shetland, the polished knife was obviously valued within the island but not elsewhere as in

contrast to other stone tools and artefacts it does not appear to have been traded. The vast majority of these knives appear to have been fashioned from the felsites of the North Mainland. Indeed a Neolithic axe factory is known to be located at North Roe approximately 10 km north-west of the proposed development area (Turner, 1998). A polished stone knife made of black porphyrite with quartz crystals was found in the Delting quadrant in the late 19th century (**Site 182**). Not all of the Shetland stone knives are polished as demonstrated by the find of a large unpolished specimen (**Site 190**) which is reported to be one of several found at Hoo Field. Evidence of stone tool working within the assessment area is represented by a hammerstone of Neolithic date which was found at Silsetter (**Site 61**). A Stone Axe (**Site 175**) is reported to have been found by the burn of Oxnabool in the Delting quadrant, no further information regarding its date and structure is available but it is possible that it is of prehistoric date. Similarly a Stone Axe was found at Kergord (**Site 236**).

Evidence of early agriculture has been found in Shetland from the analysis of buried soils in the area which revealed traces of ard marks. Although the evidence of plough or ard marks is often not considered concrete proof of early agricultural practices in other areas, analyses in Shetland have revealed actual ard-shares embedded in the soil where they had broken on impact against stones (Fojut, 1993). Divisive walls, buried soils, field clearance cairns and associated homesteads often referred to as 'Neolithic houses' are found throughout the assessment area and provide an important insight into prehistoric settlement and agricultural patterns. Since Calder's (1950) description of the first Neolithic homesteads it has since been realised that many of these structures and field-systems were in use well into the Iron Age although they are difficult to date without full excavation. Examples of prehistoric homesteads will be referred to within the Bronze Age section of this document below.

(c) **Bronze Age (2000-500BC)**

The transition from the Neolithic to the Bronze Age is defined by the introduction of metallurgy (copper, tin and gold). Knowledge of bronze arrived in Shetland around 1800 BC, however there is little evidence for early bronze working and the majority of Bronze Age evidence in the assessment area is of an agricultural nature (Fojut, 1993:31).

Typically the prehistoric homestead structures consist of a low oval bank of rubble with a hollow centre. The central hollow may show traces of alcoves around each side, and a depression at one end giving way to two distinct levels. The lower central area appears to have been used to house a large hearth upon which peat was burned. Overall dimensions are in the order of 10m by 7m, but vary greatly. Often these houses are found in groups of three or four but it is not always clear if these represent true villages or if they are the remains of a succession of houses, each built upon the disuse of the previous one (Calder 1962). The assessment area includes numerous examples of these prehistoric settlements. Due to their remarkable preservation and the importance of sites of this type, each of them is afforded protection as a scheduled ancient monument.

The possibility of prehistoric settlement sites surviving within the Kergord quadrant was raised during the walkover survey. At **Site 351**, in close proximity to the crofting remains at Grobsness, is what appeared to be the remains of the outline of an irregular building largely buried beneath a low grass earthwork. The form of the building contrasts with the rectangular structural remains of the Grobsness township and it is located apart from the rest of the settlement in close proximity to a large natural stone outcrop. The possible remains of a prehistoric site at Houbnasetter **Site 339** were also identified during the walkover survey. As with Grobsness, this area contains a dense concentration of crofting remains including the remains of numerous field and boundary walls. In places these walls cut what appear to be the remains of earlier features and walls buried beneath the peat, visible as faint

earthworks with occasional protruding stones. The possible antiquity of one of these features is confirmed in an area which has been subject to peat cutting revealing a number of large boulders in line with the faint earthwork located approximately 0.5m beneath the modern surface. Another possible prehistoric settlement was identified in the Nesting quadrant during the walkover survey of the access tracks in September 2008. The site (**Site 447**) consists of partially turf covered remains of a circular structure which measures circa 6 metres in diameter. A possible entrance was identified in its eastern wall. Its characteristics and state of preservation suggest a prehistoric date of origin, however, further investigation is required in order to confirm it.

The nearest of the known prehistoric settlement sites to the proposed development is located approximately 1km from the south-eastern boundary of the Nesting quadrant. The remains consist of an oval heap of stony debris which suggests the southern half of a house estimated to be 5m x 4m. South-west of the settlement is a plantiecrub (**Site 81**) which appears to be built from the remains of the house (Calder 1950). The foundations of what are described as a Neolithic house lie half way down the slopes of the Hill of Bellister (**Site 110**). The site is defined by large stones around a waterlogged oval hollow. The density of prehistoric homesteads on the coastal stretch south-east of the proposed development is remarkable. Two possible settlement sites have been identified and scheduled north of Loch of Kirkabister at **Site 111** and **Site 112** both of which are known as Stane Field. The somewhat mutilated remains of two homesteads can be found located at Hamar Knowe (**Sites 121 and 122**). The fragmentary remains of an oval hut foundation, within which three separate recesses are visible, were found located at Skeo Hill (**Site 125**). Stane Field and Skeo Hill are associated with field walls and clearance heaps and attest to the density and extent of prehistoric activity in the wider area. At Stanydale (**Site 395**) a possible Neolithic temple, or ritual structure, is surrounded by Bronze Age houses, circles and field boundaries. Further afield settlements of probable Bronze Age date are also known at Punds Water (**Site 366**), Mangaster Voe (**Sites 369-70**), Point of the Hurds (**Site 379**), South Houllan (**Site 381**), Sulma Water (**Site 384**), Scord of Brouster (**Site 390**), Pinhoulland (**Site 393**), Grunting School (**Site 394**), Kirk Score (**Site 403**), The Hamars (**Site 413**), Hill of Strom (**Site 415**), Hill of Olligarth (**Site 417**), Jamie Cheyne's Loch (**Site 431**), Sandwick (**Site 435**) and Lunning Head (**Site 443**).

An investigation into the use and extent of some of the homesteads within the assessment area as part of the 'South Nesting landscape project' has yielded some interesting results regarding prehistoric settlement in the area. Research undertaken at a homestead at Grunna Water (**Site 128**) revealed the extent of cultural deposits on this homestead to be defined within a very limited area. Evidence of the onset of climatic deterioration following the abandonment of this site was provided by a thin paleosol underlying a thick blanket of peat. Similar investigations at the Houlland farmstead (**Site 131**) revealed the preservation of mineral soil and a number of marks in the soil which were possibly identified as plough scoring (Dockrill *et al*, 1991).

Around the houses and sometimes spreading a great distance from them are clearance cairns. These are usually buried in peat showing no more than a small patch of stones yet on excavation some of these have proved to reach diameters of over three metres and heights of over one metre above the sub-peat ground level. A possible example of such a cairn was located on the proposed development site within the Kergord quadrant (**Site 351**). These cairns represent the results of many generations of field clearance. Another monument type which represents Bronze Age activity in the assessment area is the 'burnt mound'. Most examples are kidney shaped in plan and as their name suggests they consist of large mounds of fire cracked stones. The stones are generally small, pebble to cobble sized stones which

had been heated on fires and then dropped in water to heat it for cooking purposes. These monuments are low-lying and unobtrusive and are often overlooked as the bulk of such sites survive as amorphous or spread mounds. In the irregular and peat covered landscapes of upland Shetland, it is hard to distinguish between burnt mounds and natural hillocks. Burnt Mounds are effectively invisible from more than approximately 20 m away. Examples of this monument type are abundant within the assessment area and include **Sites 88-89, 106-07, 120, 124, 127, 129-30, 239, 380, 387, 398-99, 416 & 418**. A group of burnt mounds vulnerable to coastal erosion were surveyed in 1996. The results of this survey work indicate that burnt mounds in Shetland are not a homogenous class of site and this variety is yet to be fully assessed and accounted for (Moore & Wilson 1999)

During the Bronze Age, climatic deterioration initiated an extensive period of peat growth and climatic deterioration. Where pre-agricultural soils have survived below cairns and the walls of houses, these are much deeper and richer than the thin acid soils which characterise most of the upland slopes today. The existence of these large scale early field boundaries suggests that there was a substantial population in Shetland during the Neolithic/Bronze Age and that they were using the land in a very systematic and organised fashion. It is therefore probable that climatic deterioration and the onset of peat growth put pressure on resources and by the latter part of the Bronze Age around 100 BC it is likely that Shetland was suffering from increasing population pressure (Fojut 1993).

(d) **Iron Age (500BC – AD 400)**

The start of the Iron Age is associated with changes in society, a more restless and troubled period, which may have been the cause of an increase in weapons (Fojut 1993). A spearhead is reported to have been found at **Site 30** south-east of the Collafirth quadrant but no further information on its form or type is available. In addition the Iron Age witnessed a change in building styles with larger and more elaborate constructions such as brochs. There are 78 definite and 120 possible brochs in Shetland of which sixteen are located within the assessment area. The remains of a broch are situated on a knoll on the east coast near Housabister (**Site 119**). Occupying the flat summit of a rocky knoll known as 'The Burrian' are the remains of a broch mound 16 m in diameter and 1 m in height (**Site 122**) and an additional intermediate stone structure 16.5 m in diameter and 0.6 m high (**Site 123**). Finds made on and around the knoll include a broken mace, stone hammer and steatite whorl. A few stones of the inner and outer wall faces remain and indicate an overall diameter of 16 m with walls 4 m thick. On the Holm of Benston are the remains of a broch mound (**Site 136**). On the top of a large grass covered knoll at **Site 253** are the remains of a possible broch associated with a nearby kitchen midden which yielded a number of typical hammer stones. **Site 104** a broch consisting of a large stone-built round tower which has, within its walls, cells and passageways. At Holm of Copister (**Site 354**) the remains of a broch are visible as a grassy mound surrounded by a rampart of earth and small stones (RCAHMS 1946). A broch existed at Loch of Burreland (**Site 365**) but it has latterly been surmounted by a lime-kiln (RCAHMS 1946). The remains of a broch at Noonsbrough (**Site 375**) form a grass covered mound though the footings of the outer wall face are visible around most of the circumference (RCAHMS 1946). At Hawks Ness (**Site 414**) a conical mound is surrounded by a single course of masonry, a narrow opening is visible to the northeast (RCAHMS 1946). The obvious prime function of a broch was defensive although they may have also partially functioned as a prestige symbol.

The monument known as Hog Sound Fort (**Site 116**) comprises the remains of a late prehistoric promontory fort on the shores of Hog Sound. It includes an outer rampart approximately 0.7 m high and two ramparts 0.5 m high. An entrance is marked by a break through the centre of each rampart. Hog Island is also scheduled and it would appear that it was formerly joined to the mainland.

Several examples of the re-use of ancient monuments exist in the assessment area. The homestead at **Site 86** has at least three phases which have been variously interpreted in the past. It appears that the prehistoric farmstead has had a cist-type structure inserted into its north-west edge and has later been used as a plantiecrub (**Site 87**). Similarly the amorphous remains of a prehistoric circular house are located beneath one of two plantiecrubs which have evidently been constructed from the stones of this site. **Site 104** continues to be referred to locally as the site of a Broch despite records that in 1829 the few remaining stones of the broch were used for the building of a Methodist Chapel which stands partially on the site.

(e) **Medieval (AD 400-1600)**

There is little evidence relating to the assessment area during the early medieval period. In the wider Shetland area, Celtic priests are known to have arrived on the island and converted the local inhabitants to Christianity. However, it is not known whether the initial Christianising influence came from the south-west, through Irish followers of Columba, or from the more Northumbrian oriented Pictish church, since both traditions conducted their work through missionary churches or monasteries.

There is an absence of archaeological evidence for Shetland around AD 500, although a small number of well-carved stones in Pictish style reveal that by around 700 there were Christians in the population (Tabraham 1993). Sparse but diagnostic archaeological evidence demonstrates that a population which shared material culture traits with mainland Pictish groups existed in Shetland in the centuries before Norse settlement. For example, a Pictish symbol stone was located at Lunnasting (**Site 31**) east of the proposed development area. The eighth or ninth century inscriptions on this stone were translated by Rhys (1898) as '*King Nechtan of the kin of Ahehhhtmn*'. The inscription is placed centrally on the broad face.

Chapel Knowe (**Site 99**) located north-east of the proposed wind farm is the site of a monastery. It is enclosed by the remains of a medieval stone and earth rampart. In the western half of this enclosure are the foundations of a building thought to be the remains of an early parish church. Adjacent to Chapel Knowe is the scheduled monument known as Chapel Knowe graves (**Site 100**) which comprises of a number of oval graves which probably represent pagan Norse/Viking graves. The scheduled area includes the mounds and an area around and between them in which further burials and associated evidence may survive. In 1999 an oval grassy mound was partially excavated in advance of a graveyard extension to be developed at Lunna Kirk. Although similar in appearance to several mounds west of the Kirk, which are believed to cover Viking burials, the excavated mound consisted of dumped clay, stones and lime plaster. Additionally, at Ling Ness (**Site 124**) there is a setting of stones protruding through the turf in the shape of a boat and as such is considered to be a possible Viking boat burial.

From around 1050 AD, missionaries appeared in Shetland and during the 11th century Christianity again spread rapidly. The churches in Shetland were controlled by the Bishopric in Orkney. It is recorded that in 1194 earl Harold mounted an army to oust King Sverre of Norway. This uprising failed and when it did, Sverre took direct control of

Shetland away from the Orcadian Earldom and put the Isles under Norwegian control. Shetland was ruled by the King's representatives for the next 200 years creating closer ties with Norway.

A monastic settlement on Kirk Holm (**Site 404**) dates to about this time. The settlement consists of the footing of eight structures with a further structure appended to the north elevation of the most northerly building. This addition has mostly been destroyed by cliff erosion. The nature of the remains and the location suggest ecclesiastical origins in the 11th or 12th century; however, local tradition holds that the remains are that of a settlement erected by survivors of the Spanish Armada in 1588 (RCAHMS 1946). A 12th century church may have preceded the current 18th century church at St Magnus's (**Site 427**). Castle Holm (**Site 420**) to the south of the proposed wind farm is also dates to the 12th century. The castle stands on an islet in Loch Strom and was connected to the west shore by a causeway which is now ruinous. Traces of a wall indicate that the islet was once completely enclosed by a stone wall (RCAHMS 1946).

During the 15th century the Scottish influence in Shetland increased partially as result of the strong influence of the Scottish earl of Orkney. Additionally in 1469, King Christian I of Norway had to mortgage Shetland to pay for his daughter's marriage dowry when she married King James II of Scotland. However even after their transfer to Scotland in 1469, the islands continued to be of strategic importance to the Norse.

Ordnance Survey map dated to 1903 notes the site of a Chapel and burial ground at Collafirth (**Site 48**). It is located within a patch of pasture at which a scatter of stones can still be seen. There is little information known about this chapel but it is recorded as being the site of an ancient 'Romish'³ chapel in the Ordnance Survey Name Book of 1878. The Name Book also describes several medieval churches in the assessment area. For example, a 'Romish Chapel' is said to be located at **Site 169**, there are no structural remains on this site although the graveyard remains in use. The site of an old Chapel and Burial ground in which human remains were found is also noted at Dale (**Site 178**) by the Name Book in 1878. Again, there are no structural remains to be found in the area today although there are local reports dating from 1968 stating that structural remains were found at this site. The remains of what was known as an old chapel were removed from Kirkhouse in 1855 (Name Book 1878). Additionally there is supposed to have been a grave-yard on the east side of Kirkhouse farm, as great quantities of human remains have been dug up from time to time. St Mary's Chapel and Churchyard (**Site 405**) to the southwest of the proposed wind farm may date to the later 16th century and is, like Kirk Holm above, locally associated with survivors of the Spanish Armada shipwreck (Gifford 1992; Finnie 1990). The remains comprise a rubble and mortar semi-circular chancel arch and L-shaped graveyard (Gifford 1992; Finnie 1990).

Throughout the medieval period, land was held under the Norwegian system of udal tenure which, unlike feudal tenure, carried no obligations such as military or personal service to a superior (Nicolson, 1978). The Shetland economy AD 800-1500 was fundamentally a matter of ensuring stable subsistence, shelter and technological support for each basic residential unit, which was probably a household comprised of a nuclear or extended family (Bigelow 1992). While this was the case for most of Shetland the Hanseatic League, a medieval German mercantile league, operated out of the Old Harbour at Symbister (**Site 439**) during the late medieval period and up to the latter 17th century

³ Romish is generally defined as being of or relating to the Roman Catholic Church

(Gifford 1992; Finnie 1990). The league operated for 500 years in Shetland, exporting dried and salted cod and ling and importing luxury goods. Harbour View, or Bremen Booth, (**Site 440**) was constructed around mid 16th century, though it now incorporates an 18th century rebuilding. The booth was originally occupied by Herman Schroder and was attacked and mostly destroyed by pirates in 1563 (Gifford 1992; Finnie 1990).

(f) **Post-Medieval (AD 1600-1900)**

The earliest maps available of the proposed development area date from the 1600s and are too small in scale to reveal anything but a general impression of the site during this time. For example, a map by Blaeu 1645 (not shown) depicts a church or settlement at Lunna presumably referring to the chapel at **Site 99** and associated structures. Maps by Greenville (1693), Van Keulen (1730) and Moll (1745) (Figures 13.7-13.9) reveal a similarly vague picture with 'Luna' marked as the nearest most significant settlement. However, a map by Preston (1781) (Figure 13.10) shows a central belt of hills running through the centre of the proposed development area and in addition to Lunna marks settlements at 'Deal', 'Swining' and 'Laxo'. Although Generale de Marina (1804) (Figure 13.11), a map by Thomson (1827) (Figure 13.12) and a map by Hydrographic Office (1833) (Figure 13.13) are larger scale they reveal very little about the proposed development site itself and although farms must have existed on and around the proposed area by this time they were not of sufficient size or importance to merit recording.

Aerial photographs consulted from 1946 revealed a number of striations running at various angles across the site east of Gossa Water between Long Loch and Quinn Loch. These striations appeared to be located beneath the current vegetation and land cover and as such possibly represent the remains of former drainage channels and/or land boundaries. They are similar in form to those associated with the settled area located along the roads and voes' but they are less extensive and less concentrated. A description of the Delting parish by Mitchell (Morrison 1791) states that: *'The cultivated ground is generally at the foot of the hills and on the sea shore, and there is not a house in the parish has a mile distant from the sea'*. Indeed the concentration of settlement on the coast in contrast to the inland moorland area is demonstrated throughout the proposed development area.

The walkover survey revealed several areas of improved land within the proposed development site traversed by field drainage dykes. For example several drainage dykes traverse the hillside and valley floor in the Collafirth quadrant at **Site 11** and **Site 13**. The relative antiquity of these drainage dykes is indicated by areas of partially buried rock beneath the peat.

There are a number of sites on the proposed development area that survive as testament to post-medieval farming practices. **Site 6** consists of a roughly rectangular area which presumably once formed the walls of a rectangular building. The land located around this farmstead is better drained than the surrounding land and appears to have been improved in association with the farmstead. Several circular patches of vegetation in the surrounding area are suggestive of the former existence of circular structures on site which may have been plantier. Additionally **Site 18**, a farmstead formerly comprised of at least five buildings an enclosure, mill and a head dyke, is located at Flamister in the Nesting quadrant. The name Flamister known variously as Flamesta (1577-1656) and Flamasta (1716-1910) is a derivative of the Norse 'fla' meaning a level part on a hillside (Jakobsen, 1936). Little is known of the past history of this farmstead although it is recorded to have belonged to the Goudie family in the 19th century and quite possibly much earlier. Research into the place-names of those farmsteads within the proposed development area

has revealed the majority of them to have been in existence from at least the mid-16th century when they first appear in documentary records. Many of these place names also appear to be of Norse origin and to have evolved through time. Further details of place-name evidence can be located within the Site Gazetteer in Appendix 13.1

The coastal areas of Gonfirth within the Kergord quadrant are the focus for a dense concentration of post-medieval archaeological remains. That this area was occupied by at least the 16th century is demonstrated by a petition dated 1575 objecting to Lord Robert Stewart's oppression of Orkney and Shetland. Amongst those protesting are Magnus of Houbinsetter, Thomas of Voxsetter, Olaw of Gonfirth and Paule of Gonfirth demonstrating established settlements within the proposed development area (Greig, 1892). The remains of the farmsteads known as Burns (**Site 21**) and Area (**Site 15**) are also located within the proposed development site. Ordnance Survey maps consulted from 1880 (Figure 13.14) demonstrate that they were present from at least the 19th century.

Most of the land in Shetland was legally divided into individual holdings after the period of improvement in the rest of Scotland had ended. The main period of divisions into what were known as scattalds in Shetland occurred between 1850 and 1880. The proposed development area was formerly contained within the same scattald known as Collafirth and Swining which extended from the Hill of Dale to the Olna Firth and consisted of 1,525 acres. There are numerous documents originating from around this period which make reference to the land changes occurring on the proposed development area in this period. For example, in 1791, it is recorded that Robert Hunter of Lunna who was the major landowner in the area, instigated a division of improvable unenclosed land in Collafirth and Swining. In 1793 this division by submission of the local people was recorded (Knox, 1985).

In 1862 it is recorded that at the instigation of a Mr John Walker on behalf of Major Cameron Garth that large parts of the parish of Delting, including the proposed development area, were cleared of crofters and formed into sheep runs (Nicolson, 1978). A summons of divisions of commonty and runrig is recorded to have been raised by Charles Hay and others against Thomas, Earl of Zetland and in 1873 a Francis Taylor was appointed to survey and measure and make plans of the scattald (Knox, 1985). It is clear that with the rise of the lairds in the 18th and 19th centuries, the lot of the ordinary people of Shetland deteriorated. Where previously it had been sufficient to produce food to sustain their families it became necessary to produce a surplus which could be sold to raise revenue for an annual rent. An abundance of local resources including peat, fish, sheep, cattle and horses is listed by the account but the author also notes an unwillingness by the majority of tenants to improve their fields through the addition of lime as the tenants would not have reaped the benefits (Morrison, 1791). Moves to employ more people in the fishing industry are noted by Morrison with the effect that the coastal crofts became quite densely populated with '*Four families on a farm which was possessed twenty or thirty years ago by one.*' (Morrison 1791, 392).

By 1892, several of the crofts within the parish were apparently already ruined and out of use as demonstrated in Greig's description of the Delting Parish: '*Few things are sadder than to see the places once the cheerful habitations of man, waste and desolate and the homesteads heaps of ruins*' (Greig 1892, 341). For example, the Weisdale crofting township (**Site 227**) in the Kergord quadrant, comprising twelve unroofed buildings, and associated enclosures is depicted in the first edition Ordnance Survey maps (Figure 13.15). Only four roofed buildings and three enclosures are shown on current editions. Another crofting township (**Site 237**) also known as Weisdale is shown on first edition maps

comprising of seventeen structures and seventeen enclosures is depicted on first edition OS maps now shown to be much depleted on current maps. Similarly, although a small settlement in Gonfirth still exists, cartographic, aerial photographs and information obtained in the field indicate that this area was more densely populated in the 19th century. The township of Gonfirth (**Site 205**) once comprising fourteen structures, a mill and four enclosures is now represented by only four roofed buildings and two enclosures. Similarly the area of Voxter, Moon and Houbansetter houses' dispersed settlements have changed in configuration throughout the last century. As a group these buildings provide evidence of the use and past use of the proposed development area.

There are several other structures located outwith the proposed development boundary that are depicted on first edition Ordnance survey maps but not on current edition maps, their existence on first edition maps (see Figure 13.16) suggests that they existed from at least the 19th century onwards. Examples of such buildings are **Site 28** (North Tararet), **Site 29** (Laxo Voe), **Site 32** (Swining) **Site 35** (Swining Mill) **Site 36** (Swining) **Site 40** (Camperdown Hill) **Site 42** (Colla Firth) and **Site 46** (Bayview).

However, not all of these sites and ruins represent the immediate affects of the clearances and some can be seen to have remained occupied into the 20th century. For example, **Site 26** (Laxo) is depicted as a township comprising of six unroofed buildings and twelve roofed buildings on the first edition Ordnance Survey map (Figure 13.17) but as eleven unroofed and eleven roofed buildings on the current edition (not shown) revealing expansion of part of the settlement and abandonment of other parts of the settlement. Similarly **Site 60** (Susetter) is depicted as a township comprising of four unroofed buildings and five buildings on the 1st edition Ordnance Survey map (Figure 13.18) is now depicted as one unroofed building and four roofed buildings. A number of other post-medieval farmstead sites dating from at least the mid-19th century still survive in the assessment area, these include **Sites 33** and **34** (both known as Swining), **Site 37** (Sand Wick) **Site 41** (Colla Firth) **Site 45** (The Clubb). Several have since been altered but still merit recording in the National Monuments Record. Further details of these sites and others of a similar nature can be found located in the gazetteer in Appendix 13.1.

Remnants of the milling industry are also located within the assessment area. For example **Site 35** is the location of a former horizontal mill although no upstanding traces of the mill now remain. Similarly no remains could be found of the horizontal mill at Quhamm 2 (**Site 50**) and Quhamm 1 (**Site 54**). Reduced remains of three horizontal mills are said to exist at Camperdown Hill (**Sites 39** and **40**) and Mill Burn (**Site 40**) and are clearly marked on the first edition Ordnance Survey map. A horizontal mill at North Ham (**Site 371**) is roofless; while another at Vementry (**Site 372**) was restored in the mid-20th century (Hume 1977). Possible mills were also located at **Site 71** and **Site 75** and it is a mill also formerly existed within the proposed development site within the Nesting quadrant at Flamister (**Site 18**). What appears to be a linear embankment is depicted running across the north-eastern section of the Collafirth quadrant to terminate at Swining Mill (**Site 35**) is shown on first (Figure 13.16) and second edition (not shown) Ordnance Survey maps. Other mills existing in the vicinity of the proposed development area include Firth Horizontal Mill (**Site 154**). **Site 142** known as Mill of Girlsta was built by Hay & Co as a commercial undertaking to serve a number of farms at the time when horizontal mills such as those described above were going out of use. **Site 147** Weisdale corn mill was the largest mill in Shetland when in operation. A single storey grain threshing mill dating to the early 19th century is associated with Reawick House (**Site 411**); another is located at Veensgarth House Steading (**Site 424**).

Site 65, known as the old schoolhouse, was in use as a school until at least the later 19th century when it is labelled as ‘Hamars School, Boys and Girls’ on maps dating from 1894 (Figure 13.19). Similarly the former school house at Lunna (**Site 90**) was constructed in 1820 and is listed as a fine example of traditional Shetland building practice. In association with the schoolhouse is the rest of the buildings on Lunna Estate are listed individually and as Group Category A. These buildings include **Site 91** (Farmstead complex), **Site 92** (walled garden) and **Site 93** (Lunna House).

In addition to the industrial and agricultural remains, a number of listed residential properties are located within the assessment area, many of which provide evidence of the more wealthy landlords and contribute to a different type of typical Shetland architecture. Grobsness Haa (**Site 198**) located within the Kergord quadrant is an 18th century listed residential property which is now ruinous but stands to its original three stories and commands an impressive view over the landscape and presents a contrast to the surrounding single storey buildings of the former Grobsness township. Other examples are the 18th century laird’s house at Swinster (**Site 85**). **Sites 103-105** form a listed complex of former manse buildings dating to the 18th century. Lunna House (**Site 93**) is probably the best surviving example of a formal designed landscape in the Shetland style; it is located approximately 3.4 km from the proposed development area. The mid-17th century layout was increasingly formalised and ornamented during the early 18th and early 19th centuries, accompanying major additions to the house. The landscape is laid out in characteristic Shetland style with garths, walled enclosures, eye catchers and ancillary buildings situated in a direct relationship with one another. Located south of the main Lunna estate is St Margaret’s Kirk more commonly known as Lunna Church (**Site 100**). The official date of construction for this Kirk is 1753 although it probably incorporates earlier works and includes alterations dating to 1840 and 1933. The interior of the church includes a memorial monument to Robert Hunter and his wife dated 1700, predecessors of the Robert Hunter of the 19th century who was instrumental in implementing the clearances of the crofts. A number of other residential and ecclesiastical properties exist in the wider assessment area; full details of these are presented in Appendix 10.1.

(g) **Modern (post- AD 1900)**

Kergord House a listed 19th century structure served Shetland during the Second World War as the headquarters for the ‘Shetland Bus’ which was the operation that rescued war refugees and ferried supplies to the Norwegian underground across the North Sea. Within the proposed development area are several sites which survive as evidence of Shetland’s important role in the Second World War. Defensive remains are located at **Site 10** (South Filla Runnie) and **Site 11** (Mossy Hill) within the Collafirth quadrant. Both of these sites occupy a strong vantage point across the landscape and were presumably used as defensive look out posts. A World War Two Direction Finding (DF) site is situated near the summit of Hill of Swinster within the Delting quadrant. There are several concrete, stone and brick built buildings along the track which were part of the station all are now in ruins. A small anti-aircraft battery is located in close proximity to the Laxobigging RAF Camp (**Site 168**). A concrete base with a holdfast for either a 3-inch or Bofors gun can be seen, as well as traces of the magazines with an earthen bank around the perimeter (Guy 1995).

In addition, a coastal defence station was located at Kames (**Site 359**) and occupied from 1940 to 1944. The site comprised a battery consisting of engine houses, two searchlights, two gun emplacements and an observation post. The site was originally chosen for its commanding views over the important deep water anchorage of Sullom Voe (Guy 1995).

A First World War battery is located at Swarbacks Head (**Site 374**) and consists of two guns with their emplacements and a command post. Six-inch naval guns were landed at the site in 1918 to protect the entrance to the deep water anchorage at Swarbacks Minn (Guy 1995; Hogg 1990).

The present-day settlement geography of the region includes pockets of comparatively higher quality land supporting discrete clusters of settlement. Indeed the configuration of field boundaries within the proposed development area largely resemble those visible on maps consulted from 1880 thus demonstrating a certain continuity of use throughout the site and the landscape has remained largely unchanged throughout the last century. The settlements that lie within the assessment area have experienced relatively little development in recent years. Latterly, the oil industry has come to dominate the economy of the area and between 1973 and 1982 Sullom Voe was one of the biggest construction sites in Europe, with up to 6,000 people employed building the oil terminal. Elsewhere fishing, pastoralism and tourism continue to comprise the main industries in the area.

13.5.4 Aerial Photographs

Vertical aerial photographs of each sector of the proposed wind farm site were consulted. These dated from the years 1944, 1946, 1948, 1950 and 1989, and originated from surveys undertaken by the Royal Air Force and the Ordnance Survey. Colour aerial photographs dating from 1975 held within the SMR were also consulted although this coverage did not stretch over the whole area. These photographs show land boundaries and where applicable the post-medieval farmsteads located within the proposed development area. It is possible from these photographs to identify differences in land use or land improvement as contrasting refraction of vegetation cover. However, they added little new information to the assessment, due to well-known difficulties of interpreting aerial photographs of such terrain.

13.5.5 Field studies

Many parts of Shetland have not been subject to systematic and detailed field survey and up-to-date information on site condition and overall significance is not readily available. Therefore an archaeological reconnaissance survey was undertaken.

The survey consisted of a thorough walkover of the site in search of any visible or upstanding archaeological remains that may have previously been undiscovered. A total of eight sites were identified during the survey of the Collafirth quadrant all of which were previously unrecorded. Eighteen sites were located in the Nesting quadrant of which fifteen were previously unrecorded. Forty-five sites were located in the Kergord quadrant of which seven were previously unrecorded. Sixteen sites were located in the Delting quadrant.

Conditions underfoot were damp and boggy in most places. Vegetation on the upland areas consisted of heather moorland and grasses. Lowland vegetation consisted of sphagnum moss associated with wetland grasses, and shorter grass in some places. In close proximity to the lochs and burns the ground was often saturated and crossed with some difficulty. In some areas i.e. those close to the road and closer to the coasts, the land has been improved and enclosed and vegetation in these areas usually consisted of shorter greener grass. In these areas there are often stone outcrops where the ground is less peaty and acidic.

The Kergord quadrant, and to a lesser extent the margins of the other quadrants, contained post-medieval crofting remains in the form of small townships and farmsteads some of which remain wholly or partially in use, others are in a ruinous condition or indeed are no longer present in the landscape. The extent of several of these farmsteads has been

recorded in the NMRS using cartographic evidence although these records provide little indication of the survival or state of the remains. During the field survey a description and a note of the GPS derived co-ordinate was made of all the crofting remains identified in order to make a more accurate and up-to-date record of their current state of survival and/or use. Details of all remains identified and described during the field survey are located in the site gazetteer in Appendix 13.1.

In many places peat erosion is very severe. In some cases it may have been accelerated by or a consequence of peat cutting and grazing by sheep however in others this erosion appears to be natural. The depth of the peat varies across site and on average appears to be at least 0.5 m in depth (for more details see Chapter 14, Soil and Water). In many places the peat has eroded in gullies down to the natural glacial deposits and can be seen to be over 2 m deep in places. The glacial deposits exposed, as a result of peat erosion, on hill tops and hill sides consist of granite and coarse angular stones. A peat depth survey of the proposed access tracks and turbine locations indicates that in a substantial portion of the area affected by the proposed access tracks and turbines the peat depth is circa 5 metres and therefore there is a high potential of buried archaeological remains in those areas. During the walkover survey it was realised, however, that further erosion has occurred since the data was gathered and therefore it cannot be reliably used to predict zones of archaeological potential. Furthermore the vast majority of sites of archaeological interest are located outwith the area of the peat survey which hinders the use of the data for the prediction of archaeological potential. The sites which are located within the area of the peat data are located both on areas of shallow and deep peat deposits.

13.5.6 Summary of Baseline Conditions

The assessment area is rich in archaeological remains of periods dating from the Neolithic through to the post-medieval period. The majority of cultural heritage sites located within the proposed development area consist of the remains of post-medieval farming activity. The possibility of prehistoric activity has been raised in several locations within the Kergord quadrant. Around the farmsteads of Houbanstetter, Leedie and Burrafirth are the possible stone remains of earlier settlement. Where archaeological remains have been identified they are located almost without exception in the most hospitable areas of the landscape i.e. beside lochs or burns and in valleys or areas that are closest to the coast.

13.6 IMPACT ASSESSMENT

13.6.1 Direct Impacts

Potential impacts on known or unknown buried archaeological remains in the case of this development proposal relate to the possibility of disturbing, removing or destroying *in situ* remains and artefacts during all groundbreaking works (including excavation, construction and other works associated with the development) on the site.

Given the proposed turbine and access track layout it is predicted that most of the known sites of archaeological interest within the proposed development area will not be directly impacted. Laxo Burn (**Site 447**) is situated in such close vicinity of a proposed access track that its construction could potentially damage the *in situ* remains. It is also possible that machinery operating in the proposed development area during the construction of the

wind farm could cause damage to some sites, although the construction site will be fenced off and access to areas outside the site prohibited.

Note that the layout of the wind farm was revised in the light of the discovery, by the Viking Wind Farm archaeological surveyors, of the Laxo Burn site. The effect of the revision was to delete one wind turbine and to adjust the locations of two others so as to reduce the potential effect on this site.

Table 13.9 below outlines the predicted significance of impact by the development upon the remains found within the development area. Only sites which are predicted to have an impact are included in the table below.

Table 13.9: Predicted Significance of Direct Impact by the Development upon Remains

Site Number	Site Name	Quadrant Location	Archaeological Significance	Magnitude of direct impact from proposed development	Significance of impact
82	South Newing	Nesting	Local	High	Moderate
447	Laxo Burn	Nesting	Regional	Medium	Moderate
448	Catfirth Linen Industry Landscape	Nesting	Regional	Medium	Moderate

The significance of direct impacts upon the sites located within the proposed development area has been rated in Table 13.11 above. An impact of *Moderate* significance is expected upon Laxo Burn (**Site 447**) identified during the walkover survey. While the site was previously unrecorded it is thought to be a prehistoric settlement site and therefore been judged to be of Regional archaeological significance. A medium direct impact, through the construction of an access track in the immediate vicinity of the site, could result in the moderate loss of current information content and thus the impact upon the site is judged to be of *Moderate* significance.

An impact of *Moderate* significance is expected upon Catfirth Linen Industry Landscape (**Site 448**), In particular an access track cuts the now filled in canal, which ran between Sand Water and Cat Firth, associated with the industry. The Linen Industry site is of Regional archaeological significance in that it represents an attempt, albeit failed, at industrialisation in Shetland. A medium direct impact through the construction of an access track across the canal would result in a moderate loss of information content resulting from material alteration of the baseline conditions by removal of part of the site and thus the impact upon the site is judged to be of *Moderate* significance.

An impact of *Moderate* significance may also be incurred by South Newing (**Site 82**). The remains of this building may represent a former horizontal mill of Local archaeological significance. Given its location within 10m of the development, the remains of the building may be subject to large scale loss of current information content and thus the impact upon the site is judged to be of *Moderate* significance.

13.6.2 Indirect Impacts

Indirect impacts include potential visual impacts on the settings of protected buildings and monuments. There is 1 Listed Building and 1 Scheduled Ancient Monument within the development area. There are 134 Scheduled Ancient Monuments and 91 Listed Buildings within the 10 km study area.

A Zone of Theoretical Visibility has been produced based on a blade tip height of 145 m and the surrounding topography. A summary of the indirect visual impacts by the proposed development is provided in Table 13.10 below. Of the 91 Listed Buildings identified in the assessment, there will be no intervisibility between the proposed wind farm and nine of the Listed Buildings (Sites 142, 272, 311, 332-333, 356, 360, 408 & 422). This is also true of 23 of the 134 Scheduled Ancient Monuments (Sites 86-87, 116, 121-122, 126, 304, 315-315, 366-367, 371, 377-379, 387, 394, 399, 415-416, 432, 434 & 443). As no impact is predicted on these sites they are not included in the table below.

Table 13.10: Predicted Significance of Visual Impacts by the Proposed Wind Farm

Site No	Site Name	Distance from edge of Viking Wind Farm	No of Turbine Hubs Visible (Based on ZTV map)	Other factors affecting visibility	Significance of Visual impact
27	Laxo	0.5 km	38-77	Views already effected by modern settlement	Major
80	South Newing	1.0 km	1-37	Views north and northeast blocked by hill to a great extent	Minor
83	Hill of Dale	0.5 km	116-154	None noted	Major
84	Swinster Pony Pound	2.0 km	1-37	None noted	Minor
85	Swinister Old Haa	2.5 km	1-37	None noted	Minor
88	West Lunna Voe	6.0 km	78-115	None noted	Minor
89	West Lunna Voe	6.0 km	1-37	None noted	Negligible
90	Lunna, Schoolhouse	6.0 km	116-154	The building is located within a post-medieval settlement	Minor
91	Lunna House, Steading	6.0 km	78-115	The building is located within a post-medieval settlement	Minor
92	Lunna House, Walled Garden	6.0 km	78-115	The building is located within a	Minor

				post-medieval settlement	
93	Lunna House, Armorial Panel	6.0 km	78-115	The building is located within a post-medieval settlement	Minor
94	Lunna House, Sundial	6.0 km	78-115	The building is located within a post-medieval settlement	Minor
95	Lunna Harbour, Limekiln	6.0 km	1-37	The site is located in the vicinity of a post-medieval settlement	Negligible
96	Lunna, Harbour	6.0 km	1-37	The site is located in the vicinity of a post-medieval settlement	Negligible
97	Lunna, Harbour Building	6.0 km	1-37	The site is located in the vicinity of a post-medieval settlement	Negligible
98	Lunna Ness, Gate Piers and Walls	6.0 km	1-37	The site is located in the vicinity of a post-medieval settlement	Negligible
99	Lunna, Chapel Knowe	6.0 km	1-37	None noted	Negligible
100	Lunna Ness	6.0 km	38-77	None noted	Minor
101	Booth of Lunna	6.0 km	38-77	The site is located in the vicinity of a post-medieval settlement	Negligible
102	Lunna Ness, Gothick Cottage	6.0 km	1-37	The site is located in the vicinity of a post-medieval settlement	Negligible
103	Lunna Ness, Hunter's Monument	6.0 km	1-37	The site is located in the vicinity of a post-medieval settlement	Negligible
104	Vidlin	4.5 km	38-77	The view towards the wind farm obstructed by buildings.	Negligible
105	Mucle Head	2.5 km	1-37	Views towards	Minor

				the wind farm partly blocked by Mucklehead and Billister hills	
106	Loch of Garths	2.5 km	78-115	Views limited by intervening topography	Minor
107	Stany Cuml	3.5 km	78-115	Views towards the wind farm partly limited by topography	Major
108	Felshun	3.0 km	38-77	Views towards the wind farm partly limited by topography	Minor
110	Viles Burn	3.0 km	1-37	Views towards the wind farm partly limited by topography	Negligible
111	Stane Field	3.5 km	1-37	Views towards the wind farm partly limited by topography	Negligible
113	Brettabister, Neap Old Manse	4.0 km	38-77	None noted	Minor
114	Brettabister, Steading	4.0 km	38-77	None noted	Minor
115	Brettabister, Stable Range	4.0 km	38-77	None noted	Minor
117	Loch of Kirkabister	3.0 km	1-37	None noted	Negligible
118	St Ola's Kirk and Memorial Enclosure	2.5 km	1-37	None noted	Minor
119	Housebister	2.5 km	1-37	Views towards the wind farm partly limited by topography	Negligible
120	Bretabister	2.5 km	1-37	Views towards the wind farm partly limited by topography	Negligible
123	Burn of Scudillswick	1.0 km	1-37	Views towards the wind farm limited by topography	Minor
124	Burn of Scudillswick	1.0 km	1-37	Views towards the wind farm limited by topography	Minor
125	Skeo Hill	1.0 km	1-37	Views towards the wind farm limited by topography	Minor
126	Hill of Skellister	1.0 km	0	Views towards the wind farm	None

				mostly blocked by topography Some turbine tips might be visible.	
127	Turness	1.5 km	1-37	None noted	Minor
128	Grunna Water	1.0 km	1-37	None noted	Minor
129	Grunna Water	1.0 km	1-37	None noted	Minor
130	Skellister	1.5 km	38-77	Modern features such as roads already have a visual impact on the site	Minor
131	Houlland	1.5 km	38-77	Modern features such as roads already have a visual impact on the site	Minor
132	The Burrian	2.5 km	38-77	None noted	Minor
133	Benston	2.0 km	38-77	None noted	Minor
134	Ling Ness	3.5 km	78-115	Views towards the sea are important to the monument and as the wind farm is in the opposite direction its impact is limited	Minor
135	Ling Ness	3.5 km	78-115	None noted	Minor
136	Holm of Benston	2.5 km	38-77	None noted	Minor
137	Ward of Benston	1.5 km	1-37	None noted	Minor
138	Vassa Voe	3.0 km	78-115	Modern settlement between the wind farm and the site already has a visual impact	Minor
139	Railsbrough	3.0 km	78-115	None noted	Minor
140	Loch of Freester	1.5 km	38-77	Modern roads and buildings have already impacted on the site's visual setting	Major
141	Hard Knowe	2.0 km	78-115	Modern roads and buildings have already an impact on its visual setting	Major
143	Girlsta Limeworks	4.5 km	1-37	Modern features have already impacted on the	Negligible

				site's visual setting	
144	Loch of Girlsta	1.5 km	38-77	None noted	Minor
145	Gillaburn	2.5 km	1-37	Views towards the wind farm partly blocked by topography	Moderate
146	Weisdale, Parish Church	1.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
147	Weisdale Mill	1.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
148	Weisdale, Kergord House	1.5 km	38-77	The building is located in the vicinity of a modern settlement	Minor
149	Weisdale, South Setter House	1.0 km	38-77	The building is located in the vicinity of a modern settlement	Minor
150	Voe, Voe House	1.0 km	1-37	The building is located within a modern settlement	Minor
151	Voe, Fishing Station, Jetty	1.0 km	1-37	The building is located within a modern settlement	Minor
152	Voe, Church and Churchyard	1.0 km	1-37	The building is located within a modern settlement	Minor
173	Graven	0.5 km	1-37	Views already greatly affected by Sullom Voe oil terminal and an aerial mast to the north. Views towards the wind farm limited by topography	Major
198	Grobsness, Grobsness Haa	3.5 km	1-37	None noted	Negligible
255	Weisdale Huxter Farmhouse and Steading	2.5 km	1-37	None noted	Minor
256	Sound John Clunies	2.5 km	1-37	The building is	Minor

	Ross's House			located in the vicinity of a modern settlement	
257	Sound Fishing Station, North Booth	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
258	Sound Fishing Station, Walled Garden	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
259	Sound Fishing Station, North Walled Garden	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
260	Sound Fishing Booth	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
261	Sound Fishing Station	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
262	Sound Fishing Station Cottage	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
263	Sound Fishing Station, barn	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
264	Sound Fishing Station, barn	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
265	Sound Fishing Station, barn	2.5 km	1-37	The building is located in the vicinity of a modern settlement	Minor
267	Tresta House	2.0 km	1-37	The building is located in the vicinity of a modern settlement	Minor
268	Tresta Telephone Call Box	2.0 km	1-37	The box is located in the	Minor

				vicinity of a modern settlement	
269	Tresta House Post Office	2.0 km	1-37	The building is located in the vicinity of a modern settlement	Minor
270	Tresta House North Outbuilding	2.0 km	1-37	The building is located in the vicinity of a modern settlement	Minor
271	Tresta House North Walled Garden	2.0 km	1-37	The building is located in the vicinity of a modern settlement	Minor
283	Broch of Houlland	2 km	38-77	Modern features already have a visual impact on the site	Minor
288	Aith, Aith Church	1.5 km	38-77	The building is located in the vicinity of a modern settlement	Minor
289	Aith Church, Manse	1.5 km	38-77	The building is located in the vicinity of a modern settlement	Minor
291	East Burrafirth	1.5 km	1-37	None noted	Major
295	East Burra Firth	1.5 km	1-37	None noted	Minor
300	Tresta, Sandsound, The Store, Fishhouse	4.0 km	1-37	The building is located in the vicinity of a modern settlement	Negligible
301	Bekka Hill	4.0 km	38-77	None noted	Major
302	Croag Lee	4.0 km	38-77	None noted	Minor
303	Semblister Church	4.0 km	1-37	None noted	Negligible
304	Bixter	3.5 km	0	None noted	None
305	Park Hall	4.5 km	1-37	None noted	Negligible
306	Turdale Water	5.0 km	38-77	Views towards the wind farm restricted by topography	Moderate
307	Groni Field	5.5 km	78-115	None noted	Moderate
308	South Houllan	6.5 km	1-37	None noted	Negligible
309	Gravlaba	4.0 km	38-77	None noted	Major
310	Gravlaba	4.0 km	38-77	None noted	Minor
312	Houll	4.0 km	1-37	None noted	Negligible
313	Skeo of Gossaford	3.5 km	78-115	Modern settlement of	Major

				Busta already effects the visual setting of the site	
316	Brae Busta House Hotel	3.0 km	78-115	The building is located in the vicinity of a modern settlement	Minor
317	Brae Dovecot	3.0 km	38-77	The building is located in the vicinity of a modern settlement	Minor
318	Burravoe	1.5 km	1-37	The settlement at Burravoe and A970 already have an visual impact	Minor
319	Hill of Burravoe	1.0 km	38-77	Views to the west greatly affected by a modern settlement	Major
320	Brae House	1.5 km	38-77	The building is located within a village and therefore the visual impact of the wind farm is diminished	Minor
321	Ladie Hill	1.5 km	38-77	Views to north and east restricted by topography	Moderate
322	Islesburgh	4.5 km	1-37	Site focuses on water to the south towards which the land slopes. Views effected by A970	Minor
324	Brae, Voxter House	1.0 km	1-37	The building is located in the vicinity of a modern settlement	Minor
325	Brae, Voxter House, Walled Garden	1.0 km	1-37	The building is located in the vicinity of a modern settlement	Minor
326	Delting, Garth House	2.5 km	1-37	None noted	Minor
327	Hill of Crooksetter	3.0 km	1-37	Open views towards the	Major

				wind farm. View already greatly affected by the Sullom Voe oil terminal and two aerial masts. Possible visual link with 328	
328	Hill of Crooksetter	3.0 km	1-37	Commands extensive views in all directions. View already affected by Sullom Voe oil terminal and two aerial masts	Major
329	Fugla Ness	6.0 km	1-37	None noted	Negligible
330	Gardins	5.0 km	1-37	None noted	Negligible
331	Gardins	5.0 km	1-37	None noted	Negligible
334	Broch of Infield	4.0 km	1-37	None noted	Negligible
353	Outrabister	8.0 km	78-115	None noted	Negligible
354	Holm of Copister	8.0 km	38-77	None noted	Negligible
355	St Magnus' Kirk and Kirkyard	11.5 km	78-115	None noted	Negligible
357	Ulsta, Pier House	8.5 km	38-77	The view is greatly effected by a harbour, and occasionally blocked by the Ulsta-Toft ferry	Negligible
358	West Yell Schoolhouse	12.0 km	78-115	None noted	Negligible
359	The Kames Coastal Defence	4.5 km	1-37	Sullom Voe oil terminal has already had a significant visual impact	Negligible
361	Ollaberry, The Haa	9.0 km	1-37	The building is located within a modern settlement	Negligible
362	Ollaberry, Bods with Retaining Wall and Steps	9.0km	1-37	The buildings are located within a modern settlement	Negligible
363	Ollaberry Church and Churchyard with Monument	9.0 km	1-37	The site is located within a modern settlement	Negligible
364	Ollaberry Pier	9.0 km	1-37	The pier is located within a modern settlement	Negligible
365	Loch of Burreland	5.0 km	1-37	The view	Negligible

				towards the wind farm is partly restricted by topography	
368	Mangaster	6.0 km	116-154	Views already affected by modern settlement and fish farms	Moderate
369	Mangaster Voe	5.0 km	1-37	The view towards the wind farm is partly restricted by topography	Negligible
370	Mangaster Voe	5.0 km	1-37	The view towards the wind farm is partly restricted by topography	Negligible
374	Swarbacks Head	9.5 km	1-37	None noted	Negligible
375	Noonsbrough	8.5 km	1-37	None noted	Negligible
376	Ness of Noonsbrough	8.5 km	78-115	Some modern houses impact the visual setting already. Most of the wind farm visible in distance	Moderate
380	Noonsbrough	7.5 km	1-37	View towards the wind farm partly blocked by topography	Negligible
381	South Houllan	7.0 km	1-37	View towards the wind farm partly blocked by topography	Negligible
382	Groni Field	5.5 km	78-115	Some modern houses already visible	Moderate
383	Merki Burn	7.5 km	78-115	Some modern houses already visible	Moderate
384	Sulma Water	11.0 km	78-115	None noted	Negligible
385	Trolligarts	11.0 km	38-77	None noted	Negligible
386	Ernes Ward	8.0 km	78-115	Some modern houses already visible	Moderate
388	Stanydale	8.0 km	78-115	Some modern houses already visible	Moderate
389	Ward of Browland	9.5 km	78-115	None noted	Minor
390	Scord of Brouster	10.5 km	1-37	None noted	Negligible
391	Cattapund Knowe	11.0 km	78-115	None noted	Negligible
392	Gallow Hill	11.0 km	1-37	None noted	Negligible

393	Pinhoulland	10.5 km	1-37	None noted	Negligible
395	Stanydale	8.0 km	38-77	3 Modern farms and 2 communication towers already visible. The view towards the wind farm also partly blocked by a hill	Minor
396	Seli Voe, Setter	8 km	38-77	None noted	Minor
397	Wards of Seli Voe	8.5 km	1-37	A hill in NE partly limits the views towards the wind farm. The site is also next to a quarry	Minor
398	Ness of Gruting	9.0 km	1-37	View towards the wind farm mostly blocked by topography	Negligible
400	Craw Knowe	9.0 km	1-37	View towards the wind farm partly blocked by a hill	Minor
401	Haa of Sand with Outbuildings, Walled Gardens and Gate Piers	6.5 km	1-37	None noted	Negligible
402	Haa of Sand Cottage	6.5 km	1-37	None noted	Negligible
403	Kirk Score	6.0 km	1-37	View towards the wind farm partly blocked by a hill	Minor
404	Kirk Holm	7.5 km	1-37	None noted	Negligible
405	St Mary's Chapel and Churchyard	6.5 km	1-37	None noted	Negligible
406	Haa of Sand Bod, Slipway and Cottage	6.5 km	1-37	None noted	Negligible
407	Easter Skeld, The Steamer	9.5 km	1-37	The building is within a modern settlement	Negligible
409	Easter Skeld, Swart-Houll	10.0 km	1-37	None noted	Minor
410	Hestinsetter Hill, Giant's Grave	10.0 km	78-115	None noted	Minor
411	Reawick House, Watermill	9.5 km	38-77	None noted	Negligible
412	Reawick House	9.0 km	38-77	None noted	Negligible
413	The Hamars, Loch of Strom	3.5 km	1-37	View to northwest	Negligible

				restricted by topography	
414	Hawks Ness, Breiwick	6.5 km	78-115	None noted	Negligible
417	Hill of Olligarth	5.0 km	1-37	View towards wind farm partly restricted by topography	Negligible
418	Wadbister	6.0 km	38-77	View towards wind farm partly restricted by topography. Site next to a modern settlement	Negligible
419	Whitiness, Old Kirk	5.0 km	1-37	None noted	Negligible
420	Castle Holm	5.0 km	1-37	View towards wind farm partly restricted by topography	Negligible
421	Wormadale Hill	6.5 km	78-115	5 wind turbines already visible. Possibly linked with 428	Moderate

423	Kebister	10.0 km	38-77	A substantial industrial complex in the close vicinity already has a significant visual impact on the site	Negligible
424	Veensgarth House, Steading	9.5 km	38-77	The building is in close vicinity of modern settlement	Negligible
425	Veensgarth House	9.5 km	38-77	The building is in close vicinity of modern settlement	Negligible
426	St Magnus' Church, Mitchells of Westshore Burial Isle	9.5 km	38-77	The visual impact is already effected by 5 wind turbines in southeast	Negligible
427	St Magnus' Church and Churchyard	9.5 km	38-77	The visual impact is already effected by 5 wind turbines in southeast	Negligible
426	Tingwall, St Magnus' Church,	9.5 km	38-77	5 turbines in southeast	Negligible

	Mitchell of Westshore Burial Isle			already have a significant visual impact on the site	
428	Nesbister Hill	7.5 km	78-115	5 wind turbines already visible. Possibly linked with 421	Moderate
429	Nesbister Point, Bod of Nesbister	7.0 km	1-37	None noted	Negligible
430	Binna Ness House	9.0 km	1-37	None noted	Negligible
431	Jamie Cheyne's Loch	9.5 km	38-77	None noted	Negligible
433	Loch of Tingwall	9.5 km	1-37	None noted	Negligible

435	Sandwick	8.0 km	1-37	View towards wind farm partly restricted by topography	Negligible
436	Whalsay, Ward of Symbister Ness	8.0 km	116-154	Modern settlement has already a significant impact on the views from the site	Minor
437	Symbister, South West Dock Including New Hoose, Fish House and Carpenter's Shed	8.5 km	1-37	The view is already significantly effected by the harbour and modern settlement	Negligible
438	Symbister, Skeo	8.5 km	1-37	The view is already significantly effected by the harbour and modern settlement	Negligible
439	Symbister Old Harbour	8.5 km	38-77	The view is already significantly effected by the harbour and modern settlement	Negligible
440	Symbister, Harbour View	8.5 km	1-37	The view is already significantly effected by the harbour and modern settlement	Negligible
441	Symbister,	9.0 km	116-154	None noted	Negligible

	Symbister House				
442	Suther Ness, Whalsay	11.0 km	116-154	View towards wind farm partly restricted by lighthouse	Negligible
444	Lunning	8.0 km	1-37	None noted	Minor

The settings of Category A Listed Buildings are particularly sensitive to visual impacts, being of National Importance. Three Category A Listed Building (**Sites 299 & 401-402**) were identified in the 10 km search area. As per the wireframes produced as part of this assessment no turbines will be visible from the Trader's House and Cottage at Tresta (**Site 299**) and as such there will be no visual impact to its setting. Impacts of *Negligible* significance have been predicted upon the Haa of Sand and its associated cottage (**Sites 401-402**). These sites are circa 6.5 km from the edge of the wind farm and as such turbines only appear on the horizon. As per Table 13.4 above turbines viewed from this distance only appear prominent in clear visibility and are seen as a wider part of the landscape.

While most of the buildings at Lunna House (**Sites 90-98**) are Category B Listed together they comprise a Group Category A Listing and are also included in the Inventory Designed Landscape of Lunna House. Wireframes from the various Listed structures indicate that a large number of turbines will be visible. Some of these will only be visible on the horizon and in many cases their line will be broken by topography and/or only turbine tips will be visible over the tops of hills. As the turbines are located circa 6 km from the structures at Lunna House turbines will only appear prominent in clear visibility and are seen as a wider part of the landscape. As such the significance of impact upon these predicted to be *Minor or Negligible* for the individual elements. The designed landscape as a whole comprising a group listing of Category A will be subject to an impact of *Minor-Moderate* significance.

Category B and C(S) Listed Buildings within the 10 km assessment area are for the most part of a post-medieval and/or residential nature and it should be noted that for the majority of such sites, setting would not have been an important aspect of their original design and as such it is arguable as to whether development within the vicinity will affect the overall amenity of these structures. Additionally the majority of these sites already lie within a modern agricultural landscape, some distance from the proposed development. It is therefore predicted that there will be no more than an impact of *Negligible* or *Minor* significance for them.

Impacts upon Scheduled Ancient Monuments have for the most part been judged to be of *Negligible* or *Minor* significance, including the Scheduled possible Neolithic temple at Stanydale (**Site 395**), which is partially sheltered by a hill. For many sites, such as farmsteads and hut circles, the visual setting would not have been a primary concern. Furthermore several of the sites' visual settings have already been affected by other modern developments and therefore the visual impact of the proposed wind farm will not be as significant. However, the visual impact of the proposed development will be greater on sites such as cairns and standing stones, as their visual settings within the landscape are thought to have been extremely important. Due to the close proximity of the wind farm, the nature of the monuments and the number of turbines visible, the proposed wind farm was assessed to have an impact of *Major* significance on 13 Scheduled Ancient Monuments (**Sites 27, 83, 107, 140-141, 173, 291, 301, 309, 313, 319 & 327-328**) and

an impact of *Moderate* significance on 12 Scheduled Ancient Monuments (**Sites 145, 306-307, 321, 368, 376, 382-383, 386, 388, 421 & 428**).

All of the 13 Scheduled Ancient Monuments which will incur an impact of *Major* significance are cairns. **Sites 83, 140, 141, 173, 291, 301 & 327-328** are chambered cairns. Wireframes for these sites indicate that impacts will result from either a small number of turbines being located in extremely close proximity (**Sites 27, 173, 291 & 313**) or a large number of turbines being located at a moderate proximity (**Sites 107, 140-141, 319 & 327-328**). Turbines will be visible both up close and in the distance from Hill of Dale chambered cairn. The most significant sightline from this monument is to the southeast and while no turbines are visible along this particular sightline a significant number are visible in the periphery. As such the construction of turbines in relation to these ritual monuments constitutes a major alteration to the penumbral or close settings of a Scheduled Ancient Monument and in some cases result in a direct and substantial visual impact on a significant sightline to or from a ritual monument.

Of the 12 Scheduled Ancient Monuments that will incur an impact of *Moderate* significance 11 are cairns with six of these being chambered (**Sites 145, 306, 328, 368, 376 & 386**). The monument at Wornadale Hill (**Site 421**) is a standing stone. Views of turbines from these monuments are primarily restricted to turbines or turbine tips that are visible on the horizon as such they are thought to constitute an oblique visual impact on an axis adjacent to a significant sightline from these ritual monuments; however the significant sightline of the monument itself is not obscured.

For those Scheduled Ancient Monuments and Listed Buildings where a *Moderate* or higher visual impact is predicted, the factors influencing the significance of the visual impact on the sites are discussed individually in Appendix 13.3. Wireframes for the sites noted above are reproduced in Figures 13.27.1 to 13.27.14.

Only visual effects upon the settings of Scheduled Ancient Monuments and Listed Buildings are highlighted in this assessment, since their curtilage and amenity (in addition to their physical remains) are protected by legislation.

13.7 MITIGATION

National planning policies and planning guidance (NPPG5; PAN42), as well as local planning policies (Shetland Local Plan, Shetland Structure Plan), outlined in Section 13.1.1 of this chapter, require a mitigation response that is designed to investigate the potential for archaeological sites within the development area and thence allow the preservation or recording of any significant remains.

There are circa 89 sites of archaeological and architectural heritage interest in the vicinity of the application area (**Sites 1- 22, 59- 61, 78, 82-83, 153, 175, 177, 181- 186, 190, 196-220, 225, 227, 233-236, 282, 287, 290, 293, 336, 338, 340-341, 343-352, 358, 445-448**). However, according to the plan of the access tracks and turbine locations only Laxo Burn (**Site 447**), South Newing (**Site 82**) and the Catfirth Linen Industry Landscape (**Site 448**) may be directly impacted by the development as they are located within 10m of access tracks and turbine bases. The abundance of remains in the area surrounding the development points to the possibility of encountering similar hitherto unknown remains within the proposed development in addition to those already recorded. There has been

little or no disturbance which has taken place in the area of the proposed wind farm in recent centuries which enhances the survival prospects of any hitherto unknown buried sites of archaeological interest. Figure 13.20 indicates areas in which hitherto unknown remains are likely to be encountered. This map indicates areas of high, medium and low potential and these judgements have been based upon proximity to known archaeology and observed extent of peat erosion and/or previous disturbance.

Given the scale of known archaeological sites within and surrounding the proposed wind farm there is a possibility of encountering hitherto unknown remains, which may survive as subsurface features, during groundbreaking works associated with the development. An archaeological watching brief will be required during all ground breaking works with the aim of identifying and recording any hitherto unknown remains prior to their destruction. Where multiple machines are operating simultaneously multiple archaeologists will monitor each machine undertaking groundbreaking works. An environmental clerk of works will be employed full time on site and will supervise any required archaeological staff. The clerk will also liaise with the Council's archaeological advisor where more substantial remains are uncovered during a watching brief and further mitigation will be agreed. A process for referring monitoring to the Council's archaeological advisor will be laid out in a Written Scheme of Investigation or Method Statement, to be agreed prior to the commencement of any work on site.

In compliance with national and local planning policies, mitigation measures will include complete avoidance of known archaeological sites. By ensuring that turbines and access tracks are placed to avoid known archaeological sites these can remain *in situ*, which is the current preferred mitigation response. Micro-siting of access tracks and turbines will be considered if they might damage a site in their close vicinity such as Laxo Burn (**Site 447**). If disturbance of a known site, such as South Newing (**Site 82**) Laxo Burn (**Site 447**) and the Catfirth Linen Industry Landscape (**Site 448**) cannot be avoided an archaeological excavation may be required to ensure that the site is *preserved by record*. Depending on the result of any excavation, the developer may be required to commission post-excavation analyses and publication of findings to purge planning conditions. Where hitherto unknown archaeological remains are discovered during watching briefs these remains will also require recording and reporting. Depending upon the type of remains encountered, post-excavation analyses may also be required. As noted above, where substantial remains are revealed further mitigation measures will be agreed with the council's archaeological advisor.

Plant moving around the site during the construction of access tracks and installation of the turbines has the potential to damage known remains of archaeological significance and therefore known archaeological sites will be fenced off to ensure that these remains are not damaged during the construction phase. The council's archaeological advisor has noted that the fencing of known monuments should include a 10 metre buffer zone from the visible edge of the monument to help protect any associated subsurface remains.

As Hill of Dale (**Site 83**) is a Scheduled Ancient Monument and Grobsness Haa (**Site 193**) is a Listed Building, any direct, i.e. physical, impacts to them would require Scheduled Ancient Monument and Listed Building Consent respectively. The setting of these statutorily protected sites is also a pertinent planning consideration and the placement of turbines or access tracks in their immediate vicinity will be avoided.

13.8 SUMMARY OF RESIDUAL EFFECTS

A considerable amount of archaeological research has been carried out in the course of this study, new sites of archaeological interest have been discovered and excavations of them may subsequently be carried out as part of the project. It is therefore safe to say that the project has advanced the knowledge of the cultural history of the Shetland Islands.

The undertaking of the mitigation measures outlined above prior to and during the construction of the proposed wind farm will lead to *Minor* overall residual effects on archaeology. The fencing off of known archaeological sites in the vicinity of the application area to at least a distance of 10 m from the visual edge of each site will ensure that these sites are preserved *in situ* and thus will not be impacted upon by the construction of the wind farm.

Where sites are located within 10m of access tracks, turbine bases and buildings attempts should be made to preserve these *in situ*. However, if Laxo Burn (**Site 447**) South Newing (**Site 82**) and the Catfirth Linen Industry Landscape (**Site 448**) cannot be entirely avoided, the excavation of the sites prior to commencement of construction will ensure that the sites or site elements that would be disturbed will be preserved by record. The attendance of a watching brief officer(s), supervised by an environmental clerk of works, during all ground breaking works on site will ensure that any archaeology encountered will be identified and recorded to an appropriate level. This will also ensure preservation by record.

13.9 MONITORING

Monitoring during the construction period should take the form of an archaeological watching brief. This watching brief should be carried out on all ground breaking works. Where plant is operating simultaneously across the site several watching brief officers may be required to attend to ensure full monitoring. Where significant archaeological remains are encountered during a watching brief and further mitigation would have to be agreed, the Environmental Clerk of Works should liaise with the Council's archaeological advisor. A process for referring monitoring to the Council's archaeological advisor would be laid out in a Written Scheme of Investigation or Method Statement, to be agreed prior to the commencement of any work on site.

Where and if construction and associated landscaping lead to the diversion of water courses or drainage the affect of these diversion upon archaeological sites should be monitored periodically during the course of the working life of the wind farm. Where such changes resulted in impacts to cultural heritage remains further archaeological mitigation may be required to be agreed with the council's archaeological advisor.

Depending on methods of turbine removal during the eventual decommissioning of the wind farm, watching brief officers may be required to attend to ensure that any hitherto unknown archaeology is recorded prior to destruction.

13.10 REFERENCES

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13.10.2 Cartographic References

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13.10.3 Photographic References

Aerial photographs

The following were consulted at the RCAHMS:

Sortie	Frames	Date	Scale	Lib
106G/Scot/UK 98	4358-4368 3281-3268 3399-3412 4238-4226	18/05/1946	1:10000	B126
106G/DY 23	60065-60063 60036-60034 60055-60057 60036-60034	19/09/1944	1:33000	C175
106/DY 24	60165-60163 60141060144 60126-60122 60108-60111	19/09/1944	1:33000	C157
CPE/Scot/UK 285	3486-3468	28/08/1947	1:10000	B187
CPE/Scot/UK 280	4151-4181 3151-3181 3231-3223 4245-4223 4248-4275 3248-3275	26/08/1947	1:10000	B198
540/A/466	4075-4093 3073-3061 4070-4062	25/03/1950	1:10000	B303
62789	199-202	04/07/1989	1:24000	C295
62789	218-222 137-135 203-195	04/07/1989	1:24000	C295
62689	017-020	04/07/1989	1:24000	C294
540/A/466	3073-3069 4074-4066	25/03/1950	1:10000	B303
541/A/390	4232-4245 3234-3245	18/05/1948	1:10000	B239
62789	198-195	04/07/1989	1:24000	C295
62689	021-024	04/07/1989	1:24000	C294

ER Aerial Photographs

The following were consulted at the Shetland SMR:

Photograph Number	Site Name
093	Tumblin
099	Aiths Ness, Lee of Burrafirth
100	Lee of Burrafirth
101	Selie Ness, Papa Little South
102	Houbansetter, Quinsetter Papa Little central
116	East Hill of Houlland
117	Northpound Quila Shun
119	East Burrafirth
120	East Burrafirth
121	Loch of Burrafirth
122	West Hill of Burrafirth, Loch of Quinsetter
123	Quinsetter, Selie Ness
124	Quinsetter, Milburn Chalwell
125	Cole Ness, Houbansetter, South Voxter
126	Cole Ness
127	Linga Grobsness
132	Linga Grobsness, Cole Ness
148	Dubs of Burrafirth, Marrofield Water
149	Snelda Hill, The Hoddins Gonfirth
150	Smerla Water, Snelda Hill Gonfirth
152	Hills of Grobsness, Loch of Gonfirth
153	Grobsness, Hills of Grobsness
154	Foula Wick, Olna Firth, GrobsNess
158	Flelnadringa Loch of Gonfirth
163	Hoofield, SoutherHill
164	Souther Hill, Wester Scord Thieves Knowes
165	Souther Hill, Wester Scord