10 Cultural Heritage

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10 Cultural Heritage

10.1 Executive Summary

10.1.1 This chapter identifies the archaeological and cultural heritage value of the site and assesses the potential for direct and indirect effects on archaeological features and heritage assets resulting from the construction and operation of the Proposed Development. This chapter also identifies measures that should be taken to mitigate predicted adverse effects.

10.1.2 This assessment has identified 17 non-designated heritage assets of prehistoric to post-medieval date on the site, including Neolithic and Early Bronze Age remains, which have previously been excavated within the site at Crossiecrown and Ramberry which could potentially be of national importance. The Proposed Development has been designed so as to avoid all known heritage assets of greater than negligible importance. Minor and non-significant levels of effect are predicted for six probable post-medieval or modern assets of negligible importance on the site.

10.1.3 Planning policies and guidance require that account is taken of potential effects upon heritage assets by proposed developments and that where possible such effects are avoided. Where avoidance is not possible, effects on any significant remains should be minimised or offset. Given the potential for presently unknown archaeological remains, in particular of prehistoric and post-medieval date, to survive within the site, a programme of archaeological works designed to avoid inadvertent damage to known remains and to investigate and mitigate against the possibility of uncovering hitherto unknown remains will be undertaken.

10.1.4 The implementation of the above outlined mitigation measures will prevent inadvertent damage to known heritage features; investigate the potential for previously unknown features and disseminate the results of archaeological works to the public. Following the implementation of mitigation measures there may be a slight loss of overall information content and as such a marginal magnitude of residual impact is anticipated. The residual direct effect would be negligible and not significant.

10.1.5 Potential operational effects on the settings of all designated heritage assets within 10km of the Proposed Development, as well as the potential effects upon the Heart of Neolithic Orkney World Heritage Site (HONO WHS) which extends beyond this buffer have been considered in detail as part of this assessment. Moderate significant effects have been predicted upon the settings of two Scheduled Neolithic chambered cairns; Cuween Hill (Site 22) and Wideford Hill (Site 218). The Scheduled remains of a third Scheduled cairn, Quanterness (Site 506) stand surrounded by a tree belt on the hillslope 0.68 km south of the site. The tree belt will provide considerable screening of views of the Proposed Development to the north meaning that although the turbines will be detectable, visibility will be limited. The presence of the tree belt defines to a large degree the modern observer's appreciation and experience of the cairn and by the same measure also defines the asset's current setting. The tree belt is therefore integral to the cairn's current baseline setting and assuming that the belt is retained, its predicted future setting. The landowner has confirmed that the tree belt will be maintained for the lifetime of the Proposed Development. The effect of the Proposed Development on the setting of the cairn based on its current baseline setting is predicted to be minor and not significant. However, in the unlikely event of the tree belt being removed, the Proposed Development would be fully visible from the cairn and given the comparatively limited distance of separation the predicted effect would be elevated to moderate and significant. This assessment therefore considers the cairn's current context, with the tree belt retained, whilst acknowledging a bare earth scenario without the tree belt is a 'possible future baseline'. No direct mitigation, beyond that inherent in the Proposed Development design, is possible for operational (setting) effects.

10.1.6 There would be a moderate and significant residual effect on the settings of the Cuween Hill, Wideford Hill and Quanterness chambered cairns although the core components and integrity of their settings would not be adversely affected to the extent that the attributes that led to their designation would be compromised.

10.1.7 The possibility of cumulative effects has been considered and assessed however; no cumulative effects greater than the moderate significant effects that were noted above with respect to the Proposed Development alone were identified.

10.2 Introduction

10.2.1 This chapter considers the issues associated with the potential cultural heritage effects of the Proposed Development at Quanterness on Mainland, Orkney. The Proposed Development is for a wind farm of six turbines with a maximum tip height of up to 149.9 m and is described in detail in EIA Report Chapter 3.

10.2.2 This chapter identifies the archaeological and cultural heritage value of the site (refer to Figure 10.1,) and known heritage features within 1 km of it (refer to Figure 10.2,). The assessment also identifies all designated heritage assets up to 10 km from the site with the potential for significant effects on their setting (Figure 10.3). The assessment includes descriptions of the context of the assessment; methodology; baseline conditions; potential effects (both direct and indirect) and mitigation proposals as necessary. The assessment considers the effects of the construction and operational phases of the Proposed Development in detail. An assessment of potential cumulative effects is also made.

Statement of Capability

10.2.3 This chapter has been produced by Tom Lovekin (MA, ACIfA, Licentiate RTPI) and Lynne Roy (BA (Hons), MSc, MCIfA, FSA Scot) of AOC Archaeology Group. AOC is a Registered Archaeological Organisation of the Chartered Institute for Archaeologists (CIfA). This chapter conforms to the standards of professional conduct outlined in the Chartered Institute for Archaeologists' Standards and Guidance for Historic Environment Desk Based Assessments (CIfA 2017); Commissioning Work or Providing Consultancy Advice on the Historic Environment (CIfA 2014) and follows IEMA's EIA Guidelines (as updated) (IEMA, 2016).

10.3 Legislation, Policy and Guidelines

Legislation

10.3.1 Relevant legislation documents have been reviewed and taken into account as part of this cultural heritage assessment. Of particular relevance are:

- The Ancient Monuments and Archaeological Areas Act 1979 (as amended);
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 (as amended);
- The Planning etc. (Scotland) Act 1997 (as amended);
- Historic Environment (Amendment) (Scotland) Act 2011;
- Historic Environment (Scotland) Act 2014; and
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).

Planning Policy

10.3.2 Full details of the relevant planning policy are provided in Chapter 5. The most relevant planning policy relevant to this chapter are contained within:

- Scottish Planning Policy (Scottish Government 2014);
- Historic Environment Policy for Scotland 'HEPS' (HES 2019a);
- PAN2/2011 'Planning and Archaeology' (Scottish Government 2011); and
- The adopted Orkney Local Development Plan (Orkney Islands Council (OIC) 2017a).

10.3.3 SPP (Scottish Government 2014), HEPS (HES 2019a), PAN 2/2011 'Archaeology and Planning' (Scottish Government 2011) and Policy 8 of the adopted Orkney Local Development Plan (LDP) (OIC 2017a) deal specifically with planning policy and guidance in relation to heritage which collectively expresses a general presumption in favour of preserving heritage remains in situ. Their 'preservation by record' (i.e. through excavation and recording, followed by analysis and publication, by qualified archaeologists) is a less desirable alternative.

10.3.4 OIC's approach to proposals which effect the historic environment is set out in Policy 8(A) of the LDP which states that:

'*Development which preserves or enhances the archaeological, architectural, artistic, commemorative or historic significance of cultural heritage assets, including their settings, will be supported. Development which would have an adverse impact on this significance will only be permitted where it can be demonstrated that:*

i. Measures will be taken to mitigate any loss of this significance; and

ii. Any lost significance which cannot be mitigated is outweighed by the social economic, environmental or safety benefits of the development' (OIC 2017a, 31).

10.3.5 The setting of Scheduled Monuments is also an important consideration when determining applications. This principle is outlined in paragraph 145 of SPP and Policy 8 of the Local Development Plan for Orkney. These policies express the importance of preservation of the integrity of the setting of Scheduled Monuments and also the preservation of the special interest and character of Listed Buildings and their settings.

10.3.6 The Historic Environment Policy for Scotland (HES 2019a) sets out the Scottish Government's policy for the sustainable management of the historic environment. Key principles of the policy note that "*Changes to specific assets and their context should be managed in a way that protects the historic environment…If detrimental impact on the historic environment is unavoidable, it should be minimised. Steps should be taken to demonstrate that alternatives have been explored, and mitigation measures should be put in place*" (HEP4).

Guidance

10.3.7 Consideration has been taken of the following best practice guidelines/guidance in preparing this assessment:

- OIC Supplementary Guidance; Historic Environment and Cultural Heritage (OIC 2017b) and the further information which accompanies it; OIC Planning Policy Advice: Historic Environment (Topics and Themes) (OIC 2017c);
- The Heart of Neolithic Orkney World Heritage Site Management Plan 2014-19 (Historic Environment Scotland (HES), Royal Society for the Protection of Birds (RSPB), Scottish Natural Heritage (SNH) & OIC, 2016);
- OIC Supplementary Planning Guidance: The Heart of Neolithic Orkney World Heritage Site (OIC 2010);
- Chartered Institute for Archaeologists (CIfA) Standards and Guidance for Historic Environment Desk Based Assessments (CIfA 2017) and Commissioning Work or Providing Consultancy Advice on the Historic Environment (CIfA 2014);
- HES "Managing Change in the Historic Environment" guidance note series, particularly Historic Environment Scotland's Managing Change in the Historic Environment: Setting (HES 2016a);
- SNH published guidance for 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (SNH 2012); and

- Scottish Natural Heritage & Historic Environment Scotland Environmental Impact Assessment Handbook v5 (SNH & HES 2018).

10.3.8 HES's setting guidance defines setting as '*the way the surroundings of a historic asset or place contribute to how it is understood, appreciated, and experienced*' (HES 2016a). The guidance further notes that *'planning authorities must take into account the setting of historic assets or places when drawing up development plans and guidance, when considering various types of environmental and design assessments/statements, and in determining planning applications'* (*ibid*). It advocates a three-stage approach to assessing potential impacts upon setting:

- Stage 1: identify the historic asset.
- Stage 2: define and analyse the setting.
- Stage 3: evaluate the potential impact of the proposed changes.

10.3.9 OIC's Planning Policy Advice on the Historic Environment (Topics and Themes) contains further guidance on setting which it notes '*usually consists mainly of* [a site's] *visual relationships*[1] *with the surrounding landscapes and other sites, such as the views to and from the site*', observing that '*a site's setting may have changed over time, and is likely to be made up of a combination of:*

- *It's original extent, functional relationships and design.*
- *Associations, relationships and meanings which it has accumulated since it was created.*
- *How the site is experienced now'* (OIC 2017c, 10, 2.03).

10.4 Consultation

10.4.1 Table 10.1 summarises the responses from statutory and non-statutory consultation bodies in regard to cultural heritage and the Proposed Development.

Table 10.1 – Consultation

Consultee	Summary of Response	Where and how addressed
Historic Environment Scotland (HES)	In their response to scoping dated the 22nd of May 2019 HES stated that they considered that '*there is a potential for significant and detrimental impacts on the setting of scheduled monuments located in the vicinity of the development proposals*'. They highlighted three Scheduled Monuments: • Quanterness, chambered cairn and prehistoric house 50m NW of (Scheduled Monument, Index no.1365) (Site 506);	In the light of HES'S comments AOC responded to HES in a letter dated the 13th of September 2019 suggesting photomontages from the Quanterness, Wideford Hill and Cuween Hill chambered cairns along with a further photomontage from the Category A Listed Balfour Castle and its IGDL. Along with visualisations (wireframes) from; St. Mary's Chapel on Damsay, Ingashowe Broch, the Wasbister Burial Mounds at Stenness (Scheduled

[1] OIC also acknowledge the role that non-visual settings can play highlighting the relationship between the sunken HMS Hampshire and the memorial to those lost on it which overlooks it from the shore (OIC 2017c), 10, para 2.07.

Consultee	Summary of Response	Where and how addressed
	• Wideford Hill, chambered cairn (PIC and Scheduled Monument, Index no. 90315) (Site 218); and • the Cuween Hill, chambered cairn (PIC and Scheduled Monument, Index no. 90092) (Site 22) HES noted that they: *'therefore considered that impacts on the setting of these prehistoric chambered cairns, in particular, may raise issues of national interest such that Historic Environment Scotland would object to the proposals.'* HES also noted the presence of other assets recommending that '*particular attention*' should be paid to the settings of four further designated assets: • Damsay, St. Mary's Chapel (Scheduled Monument, Index No.90315) (Site 51); • Ingashowe, broch 300m NE of, Finstown (Scheduled Monument No. 1450) (Site 50); • Balfour Castle, Shapinsay Category A Listed (LB18615) (Site 516); and • Balfour Castle, Shapinsay, Inventoried Garden and Designed Landscape (IGDL) (GDL No.00038) (Site 559). In the light of these concerns HES recommended that photomontages be prepared to illustrate the predicted effects from the Wideford Hill, Quanterness and Cuween Hill chambered cairns along with visualisations from the	Monument No. SM7700) (Site 567). HES replied by email on the 30th of September welcoming the proposed visualisations although they suggested that a photomontage would be preferable for St. Mary's Chapel on Damsay and requested that an additional visualisation be prepared from the south terrace of the Balfour Castle IGDL. These images form the core of the cultural heritage visualisations that have been prepared in support of this chapter. However, substitutions have been made; Unfortunately, it was not feasible to prepare a photomontage from St. Mary's Chapel as Damsay is uninhabited and is not served by Orkney's public ferry service. It was also decided to substitute the suggested visualisation from the south terrace at Balfour Castle with a wireframe from the carriage drive to the east of the castle. This was to broaden the spread of viewpoints within the IGDL. A number of additional cultural heritage viewpoints, outwith those discussed with HES, have also been prepared following ZTV analysis and setting assessment visits. A series of photomontages (Figures 10.11 – 10.14, Appendix 10.3) and wirelines (Figures 10.15 – 10.24, Appendix 10.13) have been prepared in order to illustrate potential visibility from a range

Consultee	Summary of Response	Where and how addressed
	St. Mary's Chapel on Damsay and the broch at Ingashowe (HES 2019b).	of designated assets, including those identified by stakeholders at scoping.
Orkney Islands Council (OIC) Planning Officers	OIC noted HES's concerns in their scoping opinion, highlighting the possibility of an objection from the organisation and recommended that ZTV analysis should be used as the basis for selecting assets where 'significant impacts are considered likely' (OIC 2019, page 9). OIC also noted the possibility of visibility from 'some of the component parts of the Heart of Neolithic Orkney World Heritage Site', requesting a 'panoramic' visualisation/ wireframe from the Ring of Brodgar (SM 90042) (Site 566). OIC requested that this visualisation included the recently consented Costa Hill turbines. OIC also noted the potential for direct impacts on the site itself recommending that a walkover survey and desk-based assessment be undertaken.	ZTV analysis indicates that visibility could potentially vary considerably from the Ring of Brodgar and the landscape which surrounds it, with potentially little or no visibility from the stone circle itself. Given this it was decided to prepare a transect of wireframes showing the potential visibility from both the Ring of Brodgar and three Scheduled Monuments to its north; the Wasbister Burial Mounds (SM7700) (Site 567), the Bookan Chambered Cairn (SM1243) (Site 568), and the Ring of Bookan Chambered Cairn (SM1370) (Site 569), (Figures 10.11 – 10.23). All the visualisations include cumulative schemes including the Costa Head development. This chapter is informed by a desk-based assessment and the results of a walkover survey.
Orkney County Archaeologist (OIC)	AOC attended a meeting with the Orkney County Archaeologist on the 7th of October 2019. The County Archaeologist noted the confirmed presence of archaeological remains on the Site itself including a late-Neolithic settlement and a Bronze Age funerary structure. Given the clear potential for further remains	The confirmed presence of buried archaeological remains on the site was acknowledged at the design stage and the turbines have been positioned so as to allow for buffers surrounding the recorded locations of the three archaeological sites that have previously been identified on the site.

Consultee	Summary of Response	Where and how addressed
	to be present she stated that she would wish to see a structured programme of mitigation that would include geophysics. The geophysics would be followed by trial trench evaluations and if necessary, mitigation excavations and would be in accordance with a Written Scheme of Investigation (WSI) which would contain a clear method statement for post-excavation analysis and reporting. The potential for indirect effects were also discussed and the County Archaeologist noted that the core setting of Cuween Hill includes the view along the axis of the bay as well as its linkage with the Wideford Cairn to the east.	The potential for previously unrecorded remains to be present on the site is also acknowledged and a detailed mitigation strategy, which would include geophysics, trial trenching and if need be further investigations is included in section 10.8 of this chapter. The potential for indirect effects upon the settings of heritage assets is included in section 10.9 and Technical Appendix 10.2 and photomontages have been prepared for both the Cuween Hill and Wideford Hill Chambered Cairns.

10.5 Assessment Methodology and Significance Criteria

Consultation

10.5.1 EIA Scoping Opinion was received from OIC on the 21st of June 2019. AOC met with the Orkney County Archaeologist on the 7th of October 2019 to discuss the project and a walkover survey of the Site was undertaken on the 8th of October 2019. Setting assessment visits were undertaken to designated assets within 10km of the site over the course of October 2019. AOC consulted directly with Historic Environment Scotland (HES) with regard to the potential implications on nationally important heritage assets and a proposed list of visualisations was agreed with HES in September 2019. Detail regarding consultation responses and how points raised by consultees are addressed is presented in Table 10.1 above.

Study Area

10.5.2 Three study areas were identified for this assessment:

- A core study area (the site) which includes all land within the site boundary which is subject to assessment for potential direct effects. This study area was subject to walkover survey and was used to identify cultural heritage features which may be directly affected by the Proposed Development (Figure 10.1).
- A 1km study area for the identification of all known heritage features and known previous archaeological interventions in order to help predict whether any similar hitherto unknown

archaeological remains are likely to survive within the site and thus be impacted by the Proposed Development (Figure 10.2,).

- A 10km study area for the assessment of potential effects on the settings of all designated heritage assets including Scheduled Monuments; Listed Buildings; Inventoried Gardens and Designed Landscapes; Inventoried Battlefields and Conservation Areas. This study area is covered by the Zone of Theoretic Visibility (ZTV) (Figures 10.5a & b.

10.5.3 Each heritage feature referred to in the text is listed in the Gazetteer in Technical Appendix 10.1. Each has been assigned a 'Site No.' unique to this assessment, and the Gazetteer includes information regarding the type, period, grid reference, NRHE number, SMR number, statutory protective designation, and other descriptive information, as derived from the consulted sources.

Desk Study

10.5.4 The following sources were consulted for the collation of data:

- The Orkney County Archaeologist;
- The National Record for the Historic Environment (NRHE) as held by HES;
- Spatial data and descriptive information for designated assets held on Historic Environment Scotland Data website;
- Ordnance Survey maps (principally First and Second Edition), and other published historic maps held in the Map Library of the National Library of Scotland;
- Online aerial satellite imagery, Google Earth, Bing, ESRI aerial mapping;
- Scottish Remote Sensing Portal for LiDAR data;
- Unpublished historic maps and documents held by Orkney Library and Archive, Kirkwall;
- Vertical and oblique aerial photographs held by the National Collection of Aerial Photographs (NCAP, as held by HES); and
- Published bibliographic sources, including historical descriptions of the area (Statistical Accounts, Parish Records).

Site Visit

10.5.5 An archaeological walkover survey of the site was undertaken with the aim of identifying any previously unknown archaeological features. All known and accessible heritage features were assessed in the field to establish their survival, extent, significance and relationship to other sites. Weather and any other conditions affecting the visibility during the survey were also recorded. All heritage features encountered were recorded and photographed. The location of features noted in the field was recorded using ArcGIS Surveyor and cross-referenced with hand-held GPS and mapping to record and confirm the position of each feature and to record the route of the survey. All features were marked on plans, at a relevant scale, and keyed by means of Grid References to the Ordnance Survey mapping.

Assessment of Potential Effect Significance

10.5.6 This assessment distinguishes between the term 'impact' and 'effect'. An impact is defined as a physical change to a heritage feature or its setting, whereas an effect refers to the significance of this impact. The first stage of the assessment involves establishing the value and importance of the heritage feature and assessing the sensitivity of the feature to change (impact). Using the proposed design for the Proposed Development, an assessment of the impact magnitude is made and a judgement regarding the level and significance of effect is arrived at.

Direct Effect Assessment

Establishing Cultural Heritage Importance

10.5.7 The definition of cultural significance is readily accepted by heritage professionals both in the UK and internationally and was first fully outlined in the Burra Charter, which states in article one that 'cultural significance' or 'cultural heritage value' means aesthetic, historic, scientific, social or spiritual value for past, present or future generations (ICOMOS 2013, Article 1.2). This definition has since been adopted by heritage organisations around the world, including HES. HEPS notes that to have cultural significance an asset must have a particular "*aesthetic, historic, scientific or social value for past, present and future generations*" (2019a). Heritage assets also have value in the sense that they "*...create a sense of place, identity and physical and social wellbeing, and benefits the economy, civic participation, tourism and lifelong learning*" (Scottish Government, 2014).

10.5.8 For clarity, and to avoid confusion with 'significance' in EIA terms, the term 'cultural value' will be applied throughout this assessment though, as outlined above, it is acknowledged this is the same as cultural significance as defined in HEPS.

10.5.9 All heritage assets have some value; however, some heritage assets are judged to be more important than others. The level of that importance is, from a cultural resource management perspective, determined by establishing the asset's capacity to contribute to our understanding or appreciation of the past (HES, 2019a: para 17b). In the case of many heritage assets their importance has already been established through the designation (i.e. Scheduling, Listing and Inventory) processes applied by Historic Environment Scotland.

10.5.10 The criteria used to rate importance of heritage assets are presented in Table 10.2 below and relate to the criteria for designations as set out in Designation Policy and Selection Guidance (2019c), Scotland's Listed Buildings (2019d) and professional judgement.

Table 10.2 –Criteria for Establishing Relative Importance of Heritage Assets

Importance	Criteria
International and National	World Heritage Sites; Scheduled Monuments (as protected by the Ancient Monuments and Archaeological Areas Act 1979 (the "1979 Act"); Category A Listed Buildings (as protected by the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997) (the "1997 Act"); Inventory Gardens and Designed Landscapes (as protected by the 1979 Act, as amended by the Historic Environment (Amendment) (Scotland) Act 2011); Inventory Battlefields (as protected by the 1979 Act, as amended by the 2011 Act); Non-Designated features considered to be of National Importance including, fine, little-altered examples of some particular period, style or type (as protected by SPP, 2014).
Regional	Category B Listed Buildings (as protected by the 1997 Act); Conservation Areas (as protected by the 1997 Act); Major examples of some period, style or type, which may have been altered (as protected by SPP, 2014);

Importance	Criteria
	Assets/features of a type which would normally be considered of national importance that have been partially damaged (such that their ability to inform has been reduced) (as protected by SPP, 2014).
Local	Category C Listed Buildings (as protected by the 1997 Act); 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 (as protected by SPP, 2014); Assets/features of a type which would normally be considered of regional importance that have been partially damaged or asset types which would normally be considered of national importance that have been largely damaged (such that their ability to inform has been reduced) (as protected by SPP, 2014).
Negligible	Relatively numerous types of remains; Findspots of artefacts that have no definite archaeological remains known in their context; Assets/features of a type which would normally be considered of local importance that have been largely damaged (such that their ability to inform has been reduced). (The above assets are protected by Paragraph 137 of SPP, 2014).

Direct Impact Magnitude

10.5.11 Potential direct impacts, that is the physical change to known heritage features, and unknown buried archaeological remains, in the case of the Proposed Development relate to the possibility of disturbing, removing or destroying in situ remains and artefacts during ground-breaking works on this site. The magnitude of the direct impact upon heritage assets caused by the Proposed Development is rated using the classifications and criteria outlined in Table 10.3.

Table 10.3 - Criteria for Classifying Direct Impact Magnitude

Impact Magnitude	Criteria
High	Major loss of information content resulting from total or large-scale removal of deposits from a site; and/or Major alteration of a monument's baseline condition.
Medium	Moderate loss of information content resulting from material alteration of the baseline conditions by removal of part of a site; and/or Moderate alteration of a monument's baseline condition.

Impact Magnitude	Criteria
Low	Minor detectable impacts leading to the loss of information content; and/or Minor alterations to the baseline condition of a monument.
Marginal	Very slight or barely measurable loss of information content; Loss of a small percentage of the area of a site's peripheral deposits; and/or Very slight alterations to the baseline conditions of a monument.
None	No physical impact anticipated.

10.5.12 Assessment of Direct Effect Significance

The predicted level of direct effects on each heritage asset is determined by considering the asset's importance in conjunction with the predicted magnitude of the impact. The method of deriving the level of a direct effect and effect significance is provided in Table 10.4.

Table 10.4 - Level of Direct Effect based on Inter-Relationship between the Importance of the Heritage Feature and the Impact Magnitude

Impact Magnitude	Importance of Asset			
	International / National	Regional	Local	Negligible
High	Major	Major/Moderate	Moderate	Minor
Medium	Major/Moderate	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Negligible
Marginal	Minor	Minor	Negligible	Neutral

10.5.13 Using professional judgment and with reference to the Guidelines for Environmental Impact Assessment (as updated) (IEMA, 2016), this assessment considers moderate and greater effects to be significant, whilst minor and lesser effects are considered not significant.

Indirect Effect Assessment

Relative Sensitivity

10.5.14 Determining the relative cultural value of an asset is essential for establishing its importance. As set out in HEPS (HES 2019a) and its accompanying Designation Policy and Selection Guidance (2019c) a determination of value can be made with reference to the intrinsic, contextual and associative characteristics of an asset. HEPS Designation Policy and Selection Guidance (2019c) indicates that the relationship of an asset to its setting or the landscape makes up part of its contextual characteristics. The Xi'an Declaration (ICOMOS 2005) set out the first internationally accepted definition of setting with regard to cultural heritage assets, indicating that setting is important where it forms part of or contributes to the significance of a heritage asset. SPP does not differentiate between the importance of the asset itself and the importance of the asset's setting. Indeed, under the section on Scheduled Monuments it states that '*where there is potential for a*

proposed development to have an adverse effect on a scheduled monument or on the integrity of its setting, permission should only be granted where there are exceptional circumstances' (Scottish Government 2014). However, it is widely recognised (Lambrick 2008) that the importance of an asset is not the same as its sensitivity to changes to its setting. Elements of setting may make a positive, neutral or negative contribution to the value of an asset (Historic England 2017). Thus, in determining the nature and significance of impacts upon assets and their settings by the Proposed Development, the contribution that setting makes to an asset's value and importance and thus its sensitivity to changes to setting need to be considered.

10.5.15 This approach recognises the importance of preserving the integrity of the setting of an asset in the context of the contribution that setting makes to the experience, understanding and appreciation of a given asset. It recognises that setting is a key characteristic in the understanding of and appreciation of some, but by no means all, assets. Indeed, a nationally important asset does not necessarily have high sensitivity to changes to its setting (e.g. does not necessarily have a high relative sensitivity). An asset's relative sensitivity to alterations to its setting refers to its capacity to retain its ability to contribute to our understanding and appreciation of the past in the face of changes to its setting. The ability of an asset's setting to contribute to an understanding, appreciation and experience of the asset and its value also has a bearing on the sensitivity of that asset to changes to its setting. While all nationally important heritage assets are likely to be sensitive to direct impacts, not all will have a similar sensitivity to impacts on their setting; this would be true where setting does not appreciably contribute to their value or importance. Assets with high sensitivity to indirect settings impacts may be vulnerable to any changes that affect their settings, and even slight changes may reduce their information content or the ability of their settings to contribute to the understanding, appreciation and experience of them. Less sensitive assets will be able to accommodate greater changes to their settings without material reduction in their ability to contribute to our understanding of the past and in spite of such changes the relationship between the asset and its setting will still be legible.

10.5.16 The criteria for establishing an asset's relative sensitivity to changes to its setting is detailed in Table 10.5. This table has been developed based on AOC's professional judgement and experience in assessing setting impacts. It has been developed with reference to the policy and guidance noted above including SPP, HEPS (2019a) and its Designation Policy and Selection Guidance (2019b), the Xi'an Declaration (ICOMOS 2005) and Historic Environment Scotland's guidance on the setting of heritage assets (2016).

Table 10.5 - Criteria for Establishing Relative Sensitivity of a Heritage Asset to Changes to its Setting

Sensitivity	Criteria
High	An asset whose setting contributes significantly to an observer's understanding, appreciation and experience of it should be thought of as having High Sensitivity to changes to its setting. This is particularly relevant for assets whose settings, or elements thereof, contribute directly to their cultural value (e.g. form part of their Contextual Characteristics (HES, 2019a, Annex 1). For example, an asset which retains an overtly intended relationship with its setting and the surrounding landscape. These may in particular be assets such as ritual monuments which have constructed sightlines to and/or from them or structures intended to be visually dominant within a wide landscape area e.g. castles, tower houses, prominent forts etc.; and/or An asset, the current understanding, appreciation and experience of which, relies heavily on its modern setting. In particular an asset whose setting is an

Sensitivity	Criteria
	important factor in its protection and in retention of its cultural value (as per SPP 2014 definition of setting).
Medium	An asset whose setting contributes moderately to an observer's understanding, appreciation and experience of it should be thought of as having Medium Sensitivity to changes to its setting. This could be an asset for which setting makes a contribution to value but whereby its value is derived mainly from its other characteristics (HES, 2019b, Annex 1). This could for example include assets which had an overtly intended relationship with their setting and the surrounding landscape but where that relationship (and therefore the ability of the assets' surroundings to contribute to an understanding, appreciation and experience of them) has been moderately compromised either by previous modern intrusion in their setting or the landscape or where the asset itself is in such a state of disrepair that the relationship cannot be fully determined; An asset for which the current understanding, appreciation and experience of it relies partially on its modern setting regardless of whether or not this was intended by the original constructors or users of the asset; and/or An asset whose setting is a contributing factor to its protection and the retention of its cultural value.
Low	An asset whose setting makes some contribution to an observer's understanding, appreciation and experience of it should generally be thought of as having Low Sensitivity to changes to its setting. This may be an asset whose value is mainly derived from its other characteristics and whereby changes to its setting will not materially diminish our understanding, appreciation and experience of it. This could for example include assets which had an overtly intended relationship with their setting and the surrounding landscape but where that relationship (and therefore the ability of the assets' surroundings to contribute to an understanding, appreciation and experience of them) has been significantly compromised either by previous modern intrusion to its setting or the landscape or where the asset itself is in such a state of disrepair that the relationship cannot be determined.
Marginal	An asset whose setting makes minimal contribution to an observer's understanding, appreciation and experience of it should generally be thought of as having Marginal Sensitivity to changes to its setting. This may include assets for which the original relationship with their surrounding has been lost, possibly having been compromised by previous modern intrusion, but who still retain cultural value in their intrinsic and possibly wider contextual characteristics

10.5.17 The determination of a heritage asset's sensitivity to indirect impacts upon its setting is first and foremost reliant upon the determination of its setting and the elements of setting which contribute to its cultural value and an understanding and appreciation of that cultural value. The criteria set out in Table 10.5 are intended as a guide. Assessment of individual heritage assets is informed by

knowledge of the asset itself, of the asset type if applicable and by site visits to establish the current setting. This allows for the use of professional judgement and each heritage asset is assessed on an individual basis. Individual heritage assets may fall into several of the sensitivity categories outlined above, e.g. a country house may have a high sensitivity to alterations within its own landscaped park or garden, but its level of sensitivity to changes may be less when considered within the wider landscape context.

Indirect Impact Magnitude

10.5.18 Having assessed the relative sensitivity of an asset to changes to its setting (Table 10.5) it is necessary to consider the nature of the predicted change itself taking the factors that are set in Table 10.6 below into consideration and drawing upon both GIS analysis and where necessary, site visits. In cultural heritage terms the critical issue is the effect of a proposed change upon an asset's cultural heritage value, those attributes which define its identity, which if the asset has been designated will have informed this decision. The assessment is therefore a two staged process; to identify what the change will be (Table 10.6) and then predict the magnitude of this change (impact) upon the cultural heritage value of the asset (Table 10.7)

Table 10.6 - Factors affecting Magnitude of Setting Impact

Site Details	Importance of Detail for Setting Impact Magnitude
Proximity to the Proposed Development (for this assessment this is measured to the nearest turbine)	Increasing distance of an asset from the Proposed Development will, in most cases, diminish the effects on its setting.
Visibility of Proposed Development	The proportion of the view from each asset which will feature the Proposed Development will also affect the magnitude of impact. The existence of features (e.g. tree belts, forestry, landscaping or built features) that could partially or wholly obscure the development from view, will also affect the magnitude of impact.
Complexity of landscape	The more visually complex a landscape is, the less prominent the new development may appear within it. This is because where a landscape is visually complex the eye can be distracted by other features and will not focus exclusively on the new development. The presence, extent, character and scale of the existing built environment and how the Proposed Development compares to and fits in with this also affects the magnitude of setting impact (HES 2016).
Design of Development	This refers to the perceived scale of the proposed change relative to the scale of the historic asset or place and its setting. Depending on the individual asset, the design of the Proposed Development could affect the perception of dominance or foci of a particular asset and its relationship with other cultural and natural features within the landscape (SNH 2017). For example, whether the development would be seen against the skyline or against a backdrop of hills may

Site Details	Importance of Detail for Setting Impact Magnitude
	affect the perception of the prominence of an asset and/or the Proposed Development.

10.5.19 It is acknowledged that Table 10.6 above primarily deals with visual factors affecting setting. While the importance of visual elements of settings, e.g. views, inter-visibility, prominence etc., are clear, it is also acknowledged that there are other, non-visual factors which could potentially result in setting impacts. Such factors could be other sensory factors, e.g. noise or smell, or could be associative. Where applicable these are considered in concluding assessment of magnitude of impact upon setting.

10.5.20 Once the above has been considered, the prediction of the level of magnitude of impact upon setting will be based upon the criteria set out in Table 10.7 below. In applying these criteria, consideration will be given to the relationship of the Proposed Development to those elements of setting which have been defined as most important in contributing to the ability to understand, appreciate and experience the heritage asset and its cultural value.

Table 10.7 - Criteria for assessing impact magnitude upon setting

Impact Magnitude	Criteria
High	Direct and substantial visual impact on a key sightline to or from an asset; Direct and substantial visual impact on a key 'designed-in' view or vista from a Designed Landscape or Listed Building; Direct severance of the relationship between an asset and its setting; An impact that changes the setting of an asset such that it affects the integrity of its setting (SPP 2014) and materially affects an observer's ability to understand, appreciate and experience the asset.
Medium	Oblique visual impact on an axis adjacent to a key sightline to or from an asset but where the key sightline of the asset is not obscured; Oblique visual impact on a key 'designed-in' view or vista from a Designed Landscape or Listed Building; Partial severance of the relationship between an asset and its setting; Notable alteration to the setting of an asset beyond those elements of the setting which directly contribute to the understanding of the cultural value of the asset; An impact that changes the setting of an asset such that an observer's ability to understand, appreciate and experience the asset and its cultural value is marginally diminished.
Low	Peripheral visual impact on a key sightline to or from an asset; Slight alteration to the setting of an asset beyond those elements of the setting which directly contribute to the understanding of the cultural value of the asset;

Impact Magnitude	Criteria
	An impact that changes the setting of an asset, but where those changes do not materially affect an observer's ability to understand, appreciate and experience the asset.
Marginal	All other setting impacts.
None	No setting impacts anticipated.

Indirect Effect Significance

10.5.21 The level of indirect effects on the setting of heritage assets is judged to be the interaction of the asset's relative sensitivity (Table 10.5) and the magnitude of the impact (Table 10.7) and takes into consideration the importance of the asset (Table 10.2). The interactions determining level of effect on the setting of the heritage assets are shown in Table 10.8. A qualitative descriptive narrative is also provided for each asset to summarise and explain each of the professional value judgements that have been made.

Table 10.8 - Interactions determining level of effect on setting

Magnitude of Impact	Relative Sensitivity of Receptor			
	High	**Medium**	**Low**	**Marginal**
High	Major	Moderate	Minor/Moderate	Minor
Medium	Moderate	Minor/Moderate	Minor	Negligible
Low	Minor/Moderate	Minor	Negligible	Neutral
Marginal	Minor	Negligible	Neutral	Neutral

10.5.22 Using professional judgment, and with reference to the Guidelines for Environmental Impact Assessment (IEMA, 2016), effects established as moderate and greater are defined as significant, while those determined to be minor/moderate and less, are considered not significant.

Cumulative Effect Assessment

10.5.23 It is necessary to consider whether the effects of other schemes in conjunction with the Proposed Development would result in an additional cumulative change upon the settings of heritage assets, beyond the levels predicted for the Proposed Development alone. However, only those assets which are judged to have the potential to be subject to significant cumulative effects will be included in the detailed cumulative assessment provided.

10.5.24 The cumulative assessment will have regard to the guidance on cumulative effects upon heritage assets as set out in Environmental Impact Assessment Handbook V5 (SNH & HES 2018) and will utilise the criteria for assessing setting impacts as set out above. The assessment of cumulative effects will consider whether there would be an increased impact, either additive or synergistic, upon the setting of heritage assets as a result of adding the Proposed Development to a baseline, which may include operational, under construction, consented or proposed developments as agreed with OIC.

10.5.25 In determining the degree to which a cumulative effect may occur as a result of the addition of the Proposed Development into the cumulative baseline a number of factors are taken into consideration including:

- the distance between wind farms;
- the interrelationship between their zones of Theoretical Visibility (ZTV);
- the overall character of the asset and its sensitivity to wind farms;
- the siting, scale and design of the wind farms themselves;
- the way in which the asset is experienced;
- the placing of the cumulative wind farm(s) in relation to both the individual proposal being assessed and the heritage asset under consideration; and
- the contribution of the cumulative baseline schemes to the significance of the effect, excluding the individual proposal being assessed, upon the setting of the heritage asset under consideration.

10.5.26 This assessment is based upon a list of operational or consented developments along with developments where planning permission has been applied for. Cumulative developments are listed in EIA Report Chapter 6. While all have been considered, only those which contribute to, or have the possibility to contribute to, cumulative effects on specific heritage assets are discussed in detail in the text. Additionally, given the emphasis SNH place on significant effects, and the requirements of the EIA Regulations, cumulative effects have only been considered in detail for those assets where the effects upon the setting from the Proposed Development, alone, have been judged to be an effect of **minor**/**moderate** level or greater. The setting of assets which would have an effect of less than **minor**/**moderate** level are unlikely to reach the threshold of significance as defined in Table 10.8.

Requirements for Mitigation

10.5.27 National and local planning policies and planning guidance outlined in Section 10.3 of this report, require a mitigation response that is designed to take cognisance of the possible impacts upon heritage assets by a proposed development and avoid, minimise or offset any such impacts as appropriate. The planning policies and guidance express a general presumption in favour of preserving heritage remains in situ [wherever possible]. Their 'preservation by record' (i.e. through excavation and recording, followed by analysis and publication, by qualified archaeologists) is a less desirable alternative (SPP 2014, paras 137, 150; OIC 2017a Policy 8).

10.5.28 The Proposed Development has been designed where possible to avoid direct impacts upon known heritage features through careful siting of infrastructure. Where possible, impacts upon the setting of heritage assets have been avoided or minimised during the iterative design process.

Assessment of Residual Effect Significance

10.5.29 The residual effect is what remains following the application of mitigation and management measures, and construction has been completed and is thus the final level of impact associated with the Proposed Development. The level of direct residual effect is defined using criteria outlined in Tables 10.2, 10.3 and 10.4. No direct mitigation, beyond that inherent in the Proposed Development design, is possible for indirect (setting) effects of the Proposed Development and therefore residual effects on the setting of heritage assets will be the same as predicted without mitigation.

Limitations to Assessment

10.5.30 This assessment is based upon data obtained from publicly accessible archives as described in the Data Sources in Section 10.5.4 as well as a walkover survey. NRHE data and HES Designation data was downloaded from HES in September 2019. This assessment does not include any records added or altered after this date.

10.5.31 No intrusive archaeological evaluation has been undertaken to inform this assessment, as such there is the potential for hitherto unknown archaeological remains to survive within the site and to be disturbed by the works associated with the Proposed Development. This limitation is taken

account of in the Mitigation Section where measures to avoid or minimise any such effects on hitherto unknown remains are provided for.

10.6 Baseline Conditions

Designations

10.6.1 There are no designated heritage assets within the site (Figure 10.1). Two Scheduled Neolithic chambered cairns; Wideford Hill (Site 218) and Quanterness (Site 506) lie within 1km, whilst a third Scheduled Monument, the late prehistoric Rennibister Souterrain (Site 225) lies slightly beyond the 1km study area (Figure 10.2). A further 15 Scheduled Monuments including the Cuween Hill chambered cairn (Site 22) lie within the 5km study area (Figure 10.3,), whilst 43 lie within 10km (Figure 10.4) including the Stones of Stenness stone circle (Site 379) and the Maeshowe chambered cairn (Site 380) which are components of the Heart of Neolithic Orkney (HONO) World Heritage Site (WHS). The site lies immediately north of the WHS Sensitive Area which has been set so as to protect the ridgelines which form the topographic bowl that contains the Stenness components of the WHS (Figure 10.4).

10.6.2 No Listed Buildings are located within the 1km study area (Figure 10.2) although 134 stand within the 5km study area (Figure 10.3). The majority of these Listed Buildings stand within the historic core of Kirkwall and lie within the Kirkwall Conservation Area (Site 378). There are two Category A Listed Buildings; Kirkwall Cathedral (Site 297) and Tankerness House Museum (Site 264) within the Kirkwall Conservation Area. The Category A Listed Balfour Castle (Site 516) stands within its Inventoried Garden and Designed Landscape (IGDL) (Site 559) above the southern shore of Shapinsay within the 10km study area. A further 20 Category B and C Listed Buildings associated with the castle stand within the IGDL which includes the adjacent Balfour Village which is designated as a Conservation Area (Site 559).

Archaeological and Historical Background

Context

10.6.3 The site lies on the southern shore of the Wide Firth, occupying the central and eastern portions of a broad peninsular that extends northwards into the firth from the foot of Wideford Hill to the south. In contrast to the hillslope to the north, the majority of the site is low lying, although it rises gradually to the east with Crossiecrown, now a field, occupying a broad plateau at the highest point at 16 m AOD. The A965 Kirkwall – Finstown road runs along the site's southern boundary separating it from the Quanterness Farm steading which lies on the hillslope to the north. The Scheduled remains of the Quanterness chambered cairn (Site 506), lie within the curtilage of this steading partially concealed within a tree belt.

10.6.4 The site is subdivided by rectilinear field boundaries and the greater proportion of the land has been improved although limited areas of wetland survive within the lower lying extremities of the site. The land is currently used for a mixture of pasture grazing and cultivation.

Prehistoric Evidence

10.6.5 The NRHE[2] records two non-designated prehistoric sites; Crossiecrown (Site 491) and Ramberry (Site 493) located on the higher ground on the eastern part of the site. Crossiecrown was identified during a programme of fieldwalking undertaken by the University of Glasgow in 1995 which revealed a dense flint scatter over two adjoining mounds at the highest point of the field where the ground level rises to 16 m AOD. The results of a geophysical survey subsequently suggested the presence of buried structures within the mounds, whilst a barbed and tanged arrowhead and other tools found within the scatter initially suggested an Early Bronze Age date for their occupation. Three phases of excavation were undertaken on the site between 1999 and 2000 which recorded Late Neolithic to Early Bronze Age midden deposits along with the remains of two adjoining stone built structures both of which contained stone hearths, recesses and stone furniture, reminiscent of the

[2] National Record of the Historic Environment (HES)

better known, and better preserved, settlement at Skara Brae. The second building overlay the probable remains of a third earlier structure. The geophysical survey suggested that the settlement extended over a c.40 m x 45 m area (Jones, Challands *et.al.* 2010, 35).

10.6.6 Ploughing to the immediate north of Crossiecrown at Ramberry (Site 493) in 2005 revealed further archaeological remains at the southern edge of the field to the north of the field containing the Crossiecrown site. Excavation subsequently revealed a concentration of cremated bone and a square prehistoric pot placed on a flagstone. The flagstone was positioned within a rectangular stone setting that was in turn surrounded by a carefully arranged surface of beach cobbles enveloped by flagstone kerb and surrounded by a clay surface enclosed by a stone bank, which together gave the site a combined diameter of about 8 m. Although the NRHE records this feature as an '*Early Bronze Age funerary structure*', Crozier reports it as the '*Ramberry Head Ring Cairn*' and notes that it may have formed part of a cemetery. Indeed, a subsequent geophysical (gradiometer) survey indicated the possible presence of two further plough-damaged burial mounds in proximity to it (Crozier et. al. in Richards and Jones et. al. 2016, 212).

10.6.7 The remains of a stone oval chambered structure (Site 563) were also disturbed within 2 m of the cliff edge at Ramberry Head during the 2005 ploughing. This structure was excavated and found to have had an internal diameter of around 4 m. It was interpreted as the remains of a Bronze Age building although Crozier notes that the small pottery assemblage recovered from it dated to the Late Neolithic/ Bronze Age transition (*ibid*. 217). The interpretation of the function of this structure remains unclear; the NRHE classes it as a possible house although Crozier describes it as a 'passage structure' and notes that its architecture had more in common with Orcadian passage graves rather than domestic architecture, although she notes that it was not a '*passage grave of the same order as Quanterness, Wideford Hill or Cuween Hill*' (*ibid*. 219). A possible earlier structure at this location was represented by a curved length of walling.

10.6.8 Both Crossiecrown (Site 491) and Ramberry (Sites 493 and 563) lie in the north-east part of the site and given their similar chronologies it is unclear whether these discoveries represent spatially separated sites or are individual components of a wider unrecorded spread of Late Neolithic and Bronze Age remains and artefacts situated on this elevated part of the site. There is therefore a clear potential for further previously unrecorded prehistoric remains to be present on the eastern part of the site and it appears likely that the combined Crossiecrown/ Ramberry site had both funerary and domestic components.

10.6.9 The report into the geophysical, geochemical and soil micromorphological studies that were undertaken as part of the Crossiecrown project refers to further evidence identified during the fieldwalking including Iron Age or Pictish building stone and a rotary quern (Jones, Challands *et.al.* 2010, 17). Although this material is not recorded on the NRHE and may not necessarily have been found within the site it is indicative of the presence of later prehistoric or early historic occupation within the vicinity.

10.6.10 The Scheduled remains of the Quanterness chambered cairn (Site 506) lie on the elevated northern facing flank of Wideford Hill to the south of the site between Quanterness farmhouse and its steading. The cairn was described as a 'conspicuous green mound' in 1805 and had already been explored by that date. Subsequent investigations have established that it is a 'Maeshowe' class Neolithic chambered cairn. Two plans of the cairn dated 1850 (D8/A/4[G5]) and 1929 (D49/10/17) are held by the Orkney Archives in Kirkwall. The 1859 plan, prepared by Capt. Thomas, shows a long entrance passage extending into the cairn from the eastern side of the mound. This led into a large north south aligned central chamber, with six sub-chambers arranged around its perimeter, each accessed by a short passageway. Excavations by Renfrew in 1972-3 confirmed this plan and recovered considerable quantities of both human and animal bone from the interior. Renfrew also identified the remains of an Iron Age round house dated to the first millennium BC embedded into the eastern side of the mound adjacent to the entrance. The mound was resealed at the conclusion of the excavations and its interior is no longer accessible.

10.6.11 A second Maeshowe-type chambered cairn, Wideford Hill (Site 218) lies on the west facing slope of the hill to the south of the site. Wideford Hill is a Scheduled Monument and a HES Property in Care (PIC) and has been modified to allow for public access with the insertion of a concrete roof through

which access is obtained via a ladder. The mound which originally encased the cairn has also been removed exposing its internal structure and the original entrance which is positioned on the western side of the cairn facing out from the hillslope. A third Scheduled Maeshowe-type chambered cairn, Cuween Hill (Site 22) to the west of the site within the wider 5 km study area is also a PIC.

10.6.12 The NRHE records a range of non-designated prehistoric assets within 1 km of the site boundary including the position of a third lost cairn (Site 494) to the south-east of the site immediately south of the A965 at Saverock. The Saverock cairn was recorded in 1946 prior to its destruction and although it was reportedly denuded by that time its reported size, it measured 9 m x 7 m suggesting that it could potentially have been quite a substantial monument. Two stones on its eastern side projected up to heights of 6.5 m and 3.35 m respectively suggesting that, like Quanterness, it was entered from the east. The cairn had been destroyed by 1964 although an 1885 reference to discovery of cists, a perforated hammerhead, other lithic artefacts and an 'ornamental' clay vessel within a field at Saverock during the 1860's could potentially relate to this cairn (Site 500, approximate location). It therefore appears that another cairn was originally positioned on the slopes of Wideford Hill although it is unclear on present evidence whether this was a third Neolithic chambered cairn or a later Bronze Age burial mound.

10.6.13 The NRHE records four further non-designated prehistoric sites within 1 km of the site. South of the A965 the site of a Neolithic settlement was long suspected following the discovery of flint artefacts after ploughing during the early 1930's (Site 482). However, geophysics and trial trenching at this location in 2000 failed to identify any evidence of structures although a flint flake was recovered during fieldwalking in the field to the north of Site 482 in 2003 (Site 495). To the west of the site, two mounds are reported close to the coast at Rennibister, the first (Site 483) was observed in 1934 and is now lost meaning that its date and function cannot be determined, the second (Site 484) has been interpreted as a burnt mound of presumed Bronze Age date.

Early Historic Evidence

10.6.14 No early historic remains or artefacts are recorded either on the site or within the 1 km study area. However, the reported discovery of Iron Age or Pictish building stone during fieldwalking as part of the Crossiecrown project is curious as it could suggest early historic activity either on or within the vicinity of the site. However, the location of this discovery is unknown and its interpretation unconfirmed (Jones, Challands *et.al.* 2009, 17).

Medieval Evidence

10.6.15 No medieval remains or artefacts are recorded on the site. The NRHE records two non-designated assets within the 1 km study area. The first of these (Site 166) relates to rig and furrow cultivation to the south-west of the site at Rennibister suggesting that at least the western portion of the Quanterness peninsula was cleared for cultivation comparatively early. The second (Site 485) which is more enigmatic relates to the possible site of a chapel 'Mary Kirk' at Rennibister. This asset is poorly recorded although '*apparently a mound of considerable dimensions*' existed on the site until the late 19th century when it was '*wholly removed and carted to the beach*' (Wood 1927 & RCAHMS 1946). Knowledge of this asset had been lost by 1966 however given its proximity to a Bronze Age burnt mound (Site 484) there is a possibility that this lost monument was prehistoric.

Post-Medieval Evidence

10.6.16 No post-medieval remains or artefacts are recorded on the Site. The NRHE records non-designated farmhouses, cottages and steadings within 1 km at Crossiecrown (Site 492), Quanterness (Sites 487 & 501) and Saverock (Site 498).

Modern Evidence

10.6.17 No modern heritage assets are recorded on the site. The NRHE records six military sites within 1 km all of which relate to Hatson Airfield which lay to the east of the site on the north-west outskirts of Kirkwall. Hatson opened as a Royal Naval Air Station, HMS Sparrowhawk in 1939 and operated until 1948 when it closed as its site was too constrained for post-war use. Military assets associated with Hatson recorded within 1 km of the site include the site of a heavy anti-aircraft battery (Site 488)

and an associated camp (Site 502) to the south of the site on Quanterness Farm, a light anti-aircraft gun emplacement at Saverock (Site 497) as well as two pillboxes (Sites 490 & 496) and hangars (Site 499) on the western perimeter of the airfield.

Cartographic Evidence

10.6.18 Early maps of Orkney such as Blaeu's 1654 map of Orkney and Shetland (not illustrated) are highly schematic although Blaeu does show the Quanterness headland, annotated '*Contreness*' whilst an inlet is recorded as '*Rambuster*' in the approximate location of the present Rennibister Farm. Curiously, although Blaeu depicts a chapel, he records it to the south-east of the site, within the vicinity of modern Hatson, rather than to the west at Rennibister where the NRHE records the '*Mary Kirk*'. Later 17th and 18th century maps and navigational charts such as Nicholas Sanson's '*Les Isles Orkney*' (1665), Herman Moll's '*Orkney Shire*' (1745) and William Aberdeen's '*Chart of the Orkney Isles*' (1769) continue to be schematic, the notable exception being Murdoch Mackenzie's 1750 map of '*Pomona*[3] *or Mainland*' (Figure 10.6), which appears to show the Quanterness peninsula unoccupied although farmsteads are shown established at Rennibister to the west and Saverock to the east. It therefore appears that the farm at Quanterness may be a later insertion.

10.6.19 Later 18th and 19th century maps are schematic and tended to be focused on the seaways which intertwine with Orkney rather than the islands themselves. A sale plan of Quanterness prepared in 1832 for Shepherd and Wedderburn solicitors records the site in detail for the first time (Figure 10.7). The 1832 plan records the Kirkwall – Finstown Road running along the hillslope to the north of the Quanterness chambered cairn, which is marked on the plan as '*ancient Picts house*'. A comment on the plan notes a proposal to divert the road across the landholding suggesting that the modern course of the road was established in the 1830's. The site is shown divided into lots which extend from north to south from the original course of the road on Wideford Hill to the shoreline at Quanterness. The majority of the lots lie within the present site boundary, the exceptions being the easternmost lot and the western one which were presumably sold off separately and were then incorporated into the adjacent farms; Rennibister and Saverock. The land is recorded as unimproved with a '*loch*' [lochrin] (Site 548) recorded in the southern part of the site, annotation noting that '*this loch decreases much in summer*'. A croft named '*Crossiecrown*'(Site 544) is recorded slightly to the east of the site, whilst a '*small enclosure*' (Site 545), is shown slightly to the west within the site boundary, two smaller rectangular features recorded on the site to the north (Site 546) and south (Site 547) of this enclosure are unclear and could potentially represent either roofless croft buildings or, perhaps more probably animal pens. A final annotation to the south-west of the lochrin highlights an area of '*ground formerly inclosed containing 91/2 acres*' (Site 549), suggesting the possible presence of a former croft site on the southern edge of the site. No buildings are depicted on the site of the Quanterness farmstead, suggesting that the farm was established following the 1832 land sale on land which was previously unimproved although it may have been subject to limited crofting.

10.6.20 Detailed Ordnance Survey mapping commences with the First Edition 6 inch to the mile of 1882 (Figure 10.8, Appendix 10.3) which shows that a number of changes had occurred since the 1832 plan, most notably the laying of the Kirkwall - Finstown road, now the A965, along the site's southern boundary and the laying out of some of the field boundaries. Quanterness Farm had also been established to the south of the site by this time. The lochrin (Site 548) recorded in the south-east part of the site in 1832 continues to be shown on the First Edition. Despite its partial enclosure the majority of the site continues to be shown as unimproved ground on both the First Edition and also on the Second (Figure 10.9, 1903, Appendix 10.3).

Aerial Photographic Evidence

10.6.21 A search of aerial photographs held by HES's National Collection of Aerial Photography (NCAP) revealed nine vertical sorties dating from 1946 to 1987 that covered the site. The features identified are plotted on Figure 10.10 (Appendix 10.3).

[3] *An alternative historical name for Orkney's largest island. Now more commonly known as East and West Mainland.*

10.6.22 A diagonal feature consisting of two parallel lines running south-east to north-west from the main road (Sites 552-555) can be seen on a number of aerial photographs (Sorties: CPE/Scot/UK/0188, Frame 4124-4126, 10/10/1946; LEU/UK/0002, Frame 7084-7086, 16/04/1948543/1663, Frame 274, 23/02/1962; OS/64/146, Frame 34-36, 20/08/1964; OS/64/220, Frame 36,25/09/1964) taken from the 10th August 1946 to the 25th of September 1964. The north-west half of the two parallel lines become less distinct and dash like. This diagonal feature is probably a farm trackway, it links in with another diagonal trackway (Sites 550 & 551) in a T-shaped formation. The second trackway runs on a south-west to north-east alignment towards the sea.

10.6.23 A rough, circular feature was visible on four sorties undertaken from 10th October 1946 to the 28th of August 1964 (CPE/Scot/UK/0188, Frame 4124-4126, 10/10/1946; 543/1663. Frame 274, 23/02/1962; OS/64/220, Frame 35, 25/08/1964; OS/64/146, Frame 36-38, 28/08/1964). Divisions and structural elements were visible; however, they were not clear enough for any precise plans to be made. This feature (Site 556), may relate to the Late Neolithic/Early bronze Age site at Crossiecrown (Sites 491 and 493) and appears to be in the form of a slight upstanding earthwork in Frames 4124 to 4126 of Sortie CPE/Scot/UK/0188 undertaken on the 28th of August 1964; although its outline and structure appear to be less defined.

10.6.24 A linear field boundary (Site 557) creating a triangular field bounding the modern road to the south is visible on two sorties taken on the 10th of October 1946 and the 25th of September 1964 (CPE/Scot/UK/0188, Frame 4124-4126; OS/64/220, Frame 36-38). This sortie also reveals a circular feature that appears to be a contemporary farm pond (Site 558, immediately to the north of Site 557).

10.6.25 A list of all photographs consulted is included in Section 10.14 of this chapter.

Walkover Survey

10.6.26 The walkover survey was undertaken on the 8th of October 2019. Weather conditions during the survey were highly variable with clear weather interspersed with showers. Rectangular field boundaries extend across the site and the fields have been improved although small bodies of water survive within some of the lower lying fields. Land use across the site varies, with some of the fields cultivated and others set for pasture (Plates 10.1 and 10.2, Appendix 3). Unfortunately, the presence of cattle meant that it was not possible to enter all the fields, although the few which could not be directly entered were viewed from the field boundaries.

10.6.27 The land on the site rises gradually but noticeably to the east with the Crossiecrown prehistoric settlement (Site 491, Plate 10.3, Appendix 10.3), undetectable on the ground surface, located on the highest point. The Bronze Age site at Ramberry (Site 493, Plate 10.4, Appendix 10.3) lies slightly to the north on similarly elevated land and was again undetectable on the ground surface. Both the Crossiecrown and the Ramberry sites were under cultivation at the time of the walkover survey.

10.6.28 No evidence of archaeological activity could be detected on the ground surface, although given the improved nature of the fields this was to be expected and the potential that further buried remains survive on the site cannot be discounted.

10.7 Receptors Brought Forward for Assessment

10.7.1 The baseline assessment (Section 10.6) has identified a range of non-designated assets located on the site which could potentially be affected by the Proposed Development including three prehistoric sites (Sites 491, 493 and 563) that have previously been subject to detailed archaeological investigations. Other non-designated assets are recorded within 1km of site boundary and overall there is considered to be a high potential for further previously unrecorded buried remains to be buried on the site.

10.7.2 Although no designated assets are located on the site itself the baseline assessment has identified 61 Scheduled Monuments within 10 km including the Stones of Stenness stone circle (Site 379) and the Maeshowe chambered cairn (Site 380) which are components of the Heart of Neolithic Orkney (HONO) World Heritage Site (WHS) (Site 562). Two Scheduled Neolithic chambered cairns; Wideford Hill (Site 218) and Quanterness (Site 506) lie within 1km of the site. One hundred and thirty-four

Listed Buildings stand within 5km including the Category A Listed St. Magnus Cathedral (Site 297) and Tankerness House Museum (Site 264) which stand within the historic core of Kirkwall. Further Listed Buildings including the Category A Listed Balfour Castle (Site 516) which stands within an Inventoried Garden and Designed Landscape (IGDL) (Site 559) lies within 10km. Three Conservation Areas also lie within 10km; Kirkwall (Site 378), Brodgar Rural (Site 561) and Balfour Village on Shapinsay (Site 560).

Receptors Brought Forwards for Assessment of Direct Effects

10.7.3 A total of 17 cultural heritage assets, or in the case of aerial photographic evidence, possible heritage assets have been identified within the site, including Neolithic and Bronze Age remains on the eastern part of the site at Crossiecrown (Site 491) and Ramberry (Sites 493 and 563) and will therefore be carried forward for assessment. Their relative importance has been classified according to the method shown in Table 10.2, discussed below and summarised in Table 10.9.

10.7.4 Although neither the Crossiecrown late Neolithic settlement (Site 491) nor the Ramberry funerary site (Site 493) and passage structure (Site 563) are Scheduled, their discovery and excavation during the late 1990's and early 2000's has contributed to our understanding of settlement and funerary practices on Orkney during the Neolithic and Bronze Age. The excavations at Crossiecrown by Orkney Archaeological Trust working with the Universities of Glasgow and Manchester '*revealed a multi-phase Neolithic site spanning the full sequence of the Orcadian Neolithic*' from the start of the period through to the early Bronze Age transition (Jones, Challands et.al. 2010, 17). The subsequent post-excavation work that was undertaken to analyse the results of the excavation has undoubtedly contributed to their overall significance as has Crozier's recent publication on Ramberry (2016). The nearby ring cairn (Site 493) and passage structure (Site 563) that were subsequently excavated by the same team at Ramberry in 2005 have further added to our understanding of activity on Orkney during the Neolithic and Bronze Age transition. The ring cairn (Site 493) was one of three possible ploughed out cairns identified through geophysical survey on this part of the site, leading to suggestions that a barrow cemetery could potentially be present at Ramberry. It is therefore clear that the elevated north-east portion of the site, the area defined by Turbines 4, 5 and 6 was a focus of prehistoric activity from the Neolithic onwards.

10.7.5 Orkney is celebrated for its Neolithic and Bronze Age heritage, and discoveries such as Crossiecrown and the two Ramberry sites come to light relatively regularly however, this does not diminish their significance. Although both excavations were preceded by fieldwalking and surface examination, it should be noted that only very limited portions of the field have been trenched and there is therefore a high potential for further buried remains to be present. Any further discoveries could contribute both to our understanding of Orcadian prehistory and potentially to our knowledge of the broader Neolithic – Bronze Age transition. Although neither the Crossiecrown nor the Ramberry sites have been designated, given the quality of the evidence uncovered and its subsequent analysis and publication it is reasonable to consider Crossiecrown (Site 491) and Ramberry (Sites 493 and 563) to be of at least Regional if not National importance.

10.7.6 However, it should be noted that the Crossiecrown and Ramberry sites both came to light as a result of plough damage. Crozier, notes that the 2005 ploughing at Ramberry was the first time that the field had been cultivated in around 20 years and that the ring cairn (Site 493) was '*selected for excavation as cremation deposits, pottery and stone tools were clearly visible on the field surface*', which would be indicative of severe plough damage. Given that both fields were under cultivation again at the time of the walkover survey (October 2019), it is likely that more recent cycles of ploughing will have caused further damage to any buried remains which may survive within these fields.

10.7.7 Nine cropmarks have been identified on the site through aerial photography. One of these cropmarks appears to define a large subcircular area at Crossiecrown. Although it does not plot precisely it could potentially represent the raised area upon which the Crossiecrown settlement was located, and if so, the cropmark would be of Local or Regional importance. The importance of any remains located within it could potentially be higher. Two further cropmarks to the south of Crossiecrown (Sites 557 and 558) are interpreted as a possible field boundary and a possible pond, of Negligible importance. The remaining six cropmark sites (Sites 550-555) are linear features which

appear to be interrelated. Taken together these linears are arranged in a 'T' shape which doesn't appear to correlate with the current (post-1832) field layout, although given that the ground was unimproved prior to 1832 they are unlikely to predate it. It is therefore possible that they may relate to post -1832 drainage works, possibly framing farm trackways and in the absence of further evidence they are considered to be of Negligible importance.

10.7.8 Historic map evidence suggests that the ground on the site was largely unimproved prior to its enclosure and sale in 1832. However, the sale plan (Figure 10.7) records a small enclosure (Site 545), two roofless structures (Sites 546 and 547) which could potentially be abandoned crofts, or more probably given their morphology, animal pens, a lochrin (Site 548) and an area of formerly enclosed ground (Site 549). Taken together, these assets suggest that the site had been subject to limited exploitation by crofters. Evidence of post-medieval crofting is ubiquitous across much of upland Scotland including Orkney and, based on the available evidence, the potential for these assets to contribute to our understanding of Orkney during this period is limited. Sites 545-9 are therefore considered to be of Negligible importance.

Table 10.9 - Archaeological and Cultural Heritage Importance of Features within the site

Site No	Name	Description	Importance
491	Crossiecrown	Late Neolithic/ Early Bronze Age settlement.	Regional/ National
493	Ramberry	Bronze Age funerary structure (ring cairn).	Regional/ National
545	Crossiecrown	Small enclosure recorded on 1832 plan.	Negligible
546	Crossiecrown	Possible animal pen or roofless croft structure recorded on 1832 plan.	Negligible
547	Crossiecrown	Possible animal pen or roofless croft structure recorded on 1832 plan.	Negligible
548	Quanterness	Lochrin recorded as a 'loch' on a plan of Quanterness by Shepherd and Wedderburn 1832.	Negligible
549	Quanterness	Area annotated as 'ground formerly inclosed containing 9 1/2 acres' on a plan of Quanterness by Shepherd and Wedderburn 1832.	Negligible
550	Quanterness	Possible linear identified through aerial photography.	Negligible

Site No	Name	Description	Importance
551	Quanterness	Possible linear identified through aerial photography.	Negligible
552	Quanterness	Possible linear identified through aerial photography.	Negligible
553	Quanterness	Possible linear identified through aerial photography.	Negligible
554	Quanterness	Possible linear identified through aerial photography.	Negligible
555	Quanterness	Possible linear identified through aerial photography.	Negligible
556	Crossiecrown	Rough circular feature recorded on 1946-64 aerial photographs, possible related to Crossiecrown late Neolithic settlement (Site 491).	Local/ Regional
557	Crossiecrown	Linear field boundary recorded on 1946-64 aerial photographs.	Negligible
558	Crossiecrown	Circular feature (possible farm pond) recorded on 1964 aerial photographs.	Negligible/ Local
563	Ramberry Head	Neolithic/ Bronze Age passage structure.	Regional/ National

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10.7.9 Sixty Scheduled Monuments are located within 10km of the site including both the Wideford Hill (Site 218) and Quanterness (Site 506) chambered cairns which lie within 1km and the Stones of Stenness stone circle (Site 379) and the Maeshowe chambered cairn (Site 380) which lie within 10km. The Stones of Stenness and Maeshowe are both component monuments of the Heart of Neolithic Orkney World Heritage Site (HONO WHS) (Site 562). ZTV analysis (Figures 5a and 5b, Appendix 10.3) indicates that the Proposed Development will not be visible from 28 of these Scheduled monuments (Sites 1, 5, 6, 7, 24, 25, 26, 44, 45, 47, 52, 53, 54, 55, 58, 59, 60, 67, 78, 79, 81, 222, 223, 379, 380, 512, 515 & 543) including both the Stones of Stenness and Maeshowe. These assets have therefore been excluded from further assessment although the potential for effects upon the wider HONO WHS (Site 562) will be considered. The ZTV also indicates that the visibility from the Second World War Wasswick Battery (Site 8) Scheduled Monument at Queenamuckle will be limited to the theoretical visibility from the back wall of one of the battery structures. Given that the battery was built to protect the sea lane between West Mainland and Gairsay and that views out from the battery will be unaffected by the Proposed Development there is not considered to be

a potential for an indirect effect upon its setting and therefore the battery has been excluded from further assessment.

10.7.10 The Kirkwall Conservation Area extends to within 3.5 km of the Proposed Development from the south-west and encompasses both the historic core of the town and its initial phase of suburban expansion on the hillslopes to the east. The Conservation Area contains two Category A Listed Buildings; Kirkwall Cathedral, the designation for which includes the Kirkyard (Site 297) and the Tankerness House Museum (Site 264) as well as 197 Category B and C Listed Buildings. The predicted effects upon the Category A Listed Buildings are discussed individually in this assessment (Appendix 10.2), the remaining Listed Buildings are assessed as a group within the Conservation Area. ZTV analysis indicates that no visibility will be possible from two Category B Listed Buildings within the 5km Study Area; Grainbank House, Kirkwall (Site 308) and its walled garden (Site 309), and these have therefore been excluded from further assessment.

10.7.11 The Balfour Castle IGDL (Site 559) covers the south-western part of Shapinsay, extending into the 5km Study Area. Balfour Castle (Site 516), which stands prominently within the southern part of the IGDL overlooking the coast within the 10km Study Area and is Category A Listed. A further 20 Category B and C Listed Buildings associated with the castle stand within the IGDL which includes the adjacent Balfour Village which is designated as a Conservation Area (Site 560). The ZTV indicates the potential for visibility from the majority of these assets although visibility from the Conservation Area will be more restricted and limited to theoretical visibility from the central part of the designated area. No further Category A Listed Buildings lie within the 10km study area. An assessment of the potential for effects upon the settings of Category B and C Listed Buildings has identified Binscarth House (Site 565), a small Category B Listed country house on the elevated ground to the west of Finstown. Binscarth is orientated so as to face out into the Bay of Firth and will be included in the assessment in order to allow consideration of the potential effects of the Proposed Development on this view.

10.7.12 The Heart of Neolithic Orkney World Heritage Site (WHS), is located to the west of the site and consists of six individual monuments set within two separate Buffer zones at Stenness within the core of West Mainland and at the Bay of Skaill on its western coast, where the Neolithic Settlement of Skara Brae is located. The two buffer zones and the wider sensitive area which surrounds the WHS are identified in the 2014-19 WHS management plan (HES 2016a, 7). The wider sensitive area extends to the A965 to the immediate south of the site on the northern slopes of Wideford Hill and is intended to protect the '*sensitive setting of the WHS*' from '*large scale development outwith the buffer zone*' (*ibid*. 9). Five of the WHS Scheduled Monuments are located at Stenness within proximity to the lochs of Stenness and Harray; the Maeshowe chambered cairn (Site 380), the Barnhouse Stone (Site 47) which is aligned with Maeshowe's passageway, the Stones of Stenness stone circle (Site 379), the adjacent Watch Stone and finally the Ring of Brodgar stone circle (Site 566). Only monuments within the care of Scottish Ministers (directly managed by HES) are included within the WHS although the management plan notes that '*other sites within the immediate vicinity… contribute greatly to our understanding of the WHS and support its OU*V' (*ibid*.8).

10.7.13 ZTV analysis indicates that there will be no visibility from Maeshowe (Site 380), the Barnhouse Stone (Site 47), the Stones of Stenness (Site 379) the Watch Stone or the Ring of Brodgar (Site 566), so consideration of the potential for effects upon the setting of these assets individually will be excluded from further assessment. The ZTV does however suggest that the Proposed Development would be visible from the WHS buffer zone to the north of the Ring of Brodgar and therefore the potential for visibility in views of the Ring of Brodgar from the north will be addressed by this assessment. This visibility would be through a gap in the eastern ridgeline between the Hill of Heddle and Snaba Hill through which the A965 passes.

10.7.14 Given the preliminary findings outlined above the following assets have been carried forward for detailed assessment:

- Two Scheduled Monuments located within 1km of the site; the Quanterness and Wideford Hill cambered cairns (Sites 218 and 506) (Figure 10.2);

- 15 Scheduled Monuments located between 1-5 km from the site (Sites 22-3, 27-8, 48, 50-1, 63-5, 217, 219, 221, 381 and 503) including the Cuween Hill chambered cairn (Site 22), the Rennibister souterrain (Site 48), Ingashowe Broch (Site 50) and St. Mary's Chapel on Damsay (Site 51) (Figure 10.3);
- 132 Listed Buildings located between 1-5 km of the site including the Category A listed St. Magnus Cathedral Kirkwall (Site 297) and Tankerness House Museum (Site 264) as well as the Kirkwall Conservation Area (Site 378) within which the majority of these assets stand (Figure 10.3);
- 18 Scheduled Monuments located between 5-10 km from the site (Sites 2-4, 49, 57, 61-2, 66, 220, 504-5, 507-511 and 513-4) (Figure 10.4);
- The Balfour Castle IGDL (Site 559) which extends within 5km of the site (Figure 10.3) as well as Category A Listed Balfour Castle (Site 516) the Balfour Village Conservation Area (Sites 560) which lie between 5-10 km from the site (Figure 10.4).
- Category B Listed Binscarth House (Site 565) at Firth which lies between 5-10km from the site (Figure 10.3).
- The Ring of Brodgar (Site 566) component of the HONO WHS. Although the Ring of Brodgar itself lies outwith the ZTV, visibility from within the buffer zone to its north is possible and the assessment therefore considers the potential appearance of the Proposed Development in views which include the Ring of Brodgar. This portion of the WHS lies between 10-15km from the site (Figure 10.4).

10.8 Standard Mitigation

10.8.1 National planning policies and planning guidance as well as the local planning policies require that account is taken of potential effects upon heritage assets by proposed developments and that where possible such effects are avoided. Where avoidance is not possible these policies require that any significant effects on remains be minimised or offset.

10.8.2 Although no surface remains were identified on the site during the walkover survey, the presence of potentially nationally significant non-designated prehistoric remains on the site is well documented and there is a high potential for further previously unrecorded buried remains to be present. In the event of consent, a 100m protective buffer will be maintained around the sites of both the Crossiecrown late Neolithic settlement (Site 491) and the Ramberry ring cairn (Site 493) as recorded by HES on the NRHE. No works will be undertaken within these buffers which will be fenced prior to the onset of construction and not entered for the duration of the works. The site of the passage structure that was excavated on the Ramberry headland (Site 563) will also be fenced off and protected prior to construction and it is proposed to lay the access route and hardstanding for Turbine 5 to the south of the turbine, so as to increase the distance of separation between the non-designated asset and the proposed infrastructure (Figure 10.1).

10.8.3 The potential for previously unrecorded buried remains to be affected will be addressed by a programme of archaeological works, undertaken as a condition of planning consent which will be undertaken prior to the commencement of construction of the Proposed Development. These works will include a geophysical survey of the proposed access routes, cable routes, turbine locations, crane pads and other infrastructure. The geophysical survey will cover a 60m buffer on either side of the proposed centrelines for the access tracks and cable routes so as to allow for micro siting in the event of significant remains being identified during the trial trenching. A 100m buffer around each of the proposed turbine locations will be covered to allow for micro siting and the future presence of the turbines, as once constructed their magnetic signatures will prevent further geophysical surveys from being undertaken within their vicinity. The geophysical survey will be followed by trial trenching which will be targeted on any possible anomalies that were identified as well as a representative percentage of the total footprint of the development infrastructure.

Depending on the results of these investigations further works during construction including further excavations and/ or an archaeological watching brief may be required. The purpose of the geophysical survey and the archaeological trial trenching will be to identify any archaeological remains threatened by the Proposed Development, to assess their significance and to mitigate any impact upon them either through avoidance or, if preservation in situ is not warranted, through preservation by record. Depending upon the results of the geophysical survey and the trial trenching there is the potential that further works, such as excavation and post-excavation analyses, could be required. Details of mitigation will be agreed with OIC in consultation with the Orkney Country Archaeologist through a WSI.

10.8.4 Any archaeological fieldwork commissioned in order to mitigate direct effects will result in the production and dissemination of a professional archive, which will add to our understanding of the cultural heritage value of the site.

10.8.5 The LVIA Chapter 6 discusses the measures to reduce the appearance or visual presence of the turbines within the wider landscape. The Proposed Development turbine layout has been designed to present a clearly structured, balanced arrangement which responds positively to key landscape features and local topography. Steps have been taken to promote a simple balanced composition that minimises overlapping turbines, skyline effects and back-grounding. Figure 2.7 compares the Scoping Development layout with the Proposed Development layout from Cuween Hill chambered cairn and shows how the Proposed Development has been designed to create a more balanced arrangement of turbines from this location. Similarly, Figure 2.8 shows how the landform of Wideford Hill has been used to limit visibility of turbines when viewed from the cairn. Consideration has also been given to other design issues, including turbine colour, size and siting; the design and form of the substation building; and the alignment of access tracks to ensure these proposed features relate to the key characteristics of the landscape. As setting effects largely result from the visual presence of the turbines within the landscape the same mitigation measures apply to setting effects on cultural heritage assets.

10.9 Likely Effects

Construction

10.9.1 Construction effects on cultural heritage receptors are limited to direct impacts on heritage features and deposits. Indirect impacts upon the setting of designated heritage assets are considered under operational effects.

10.9.2 Six of the non-designated assets that have been identified on the site could potentially be directly impacted by the Proposed Development (Sites 548, 552-555 and 558) (Figures 10.1 and 10.10). These assets were all identified either through historic map regression or aerial photography and include the former site of a lochrin (Site 548), the site of a possible pond (Site 558), and the possible intersection of two trackways (Sites 552-555). These types of assets are commonly encountered in upland Scotland and these examples are considered to be of negligible importance (Table 10.9). If a worst-case scenario were to be adopted as a precautionary approach and the Proposed Development were to result in a major loss of information content to these assets (Table 10.3) this would constitute an impact of high magnitude and given their negligible sensitivity a **minor** level of direct effect (Table 10.4). **Minor** levels of effect would not be considered significant in EIA terms and it should be noted that these predictions are based on a worst-case scenario and the actual level of effect may prove to be less.

10.9.3 The Proposed Development has been designed to avoid direct impacts on known heritage assets possible. There would be no direct impacts from construction activities upon any other known heritage assets within the site.

10.9.4 Previous archaeological investigations have identified buried prehistoric sites of regional/ national importance within the north-east corner of the site at Crossiecrown (Site 491) and Ramberry (Sites 493 and 563). The Crossiecrown and Ramberry sites will be fenced and protected during construction and will not therefore be directly impacted, and no effects are anticipated.

10.9.5 Aerial photographic analysis and previous archaeological investigations within the site have shown that, the site has been subject to some previous disturbance from ground improvement drainage works and ploughing and such activity may have disturbed superficial buried deposits on the site. However, there remains a clear potential for further previously unknown buried remains, including prehistoric remains of regional or national importance, being disturbed during the construction phase of the Proposed Development. Given this a mitigation strategy will be required to safeguard and, where necessary, record any such remains. A four-stage mitigation strategy; geophysical survey, trial trenching followed by excavation and post-excavation analysis[4] will be undertaken as set out in section 10.8 above. The level of any potential effect on previously unrecorded remains cannot be quantified at present as the value of any further assets which may be present on the site is, by their very nature unknown. However, should any previously unrecorded significant remains be identified on the site, either through geophysical survey, trial trenching or subsequent works they will be subject to an appropriate archaeological mitigation strategy, the results of which will contribute to our overall understanding of Orkney's past and therefore create a beneficial legacy.

Operation

10.9.6 Direct effects upon any previously unknown archaeological remains which may be present on the site would cease with the completion of the groundworks stage of construction and consequently no direct effects are predicted during the operational phase of the Proposed Development. All operational phase effects would thus be indirect and would be limited to impacts upon the settings of assets such as World Heritage Sites, Scheduled Monuments, Listed Buildings, and Inventoried Gardens and Designed Landscapes (IGDL) as well as the characters of Conservation Areas.

10.9.7 ZTV analysis and mapping have been used to identify those designated assets that could potentially be indirectly affected by changes to their settings during the operational phase of the Proposed Development and the assets that will be carried forward for detailed assessments have been outlined in paragraphs 10.7.10 to 10.7.15 (above). The detailed assessments have included a review of the contextual characteristics of each asset using information drawn from their designation documentation, supplemented by observations on the morphology, condition and character of each asset and the nature of their settings made during site visits undertaken in October 2019[5].

10.9.8 Predicted effects of **moderate** and above are considered significant in EIA terms. This assessment has identified potential effects of **moderate** significance upon the settings of three Scheduled Neolithic chambered cairns; Cuween Hill (Site 22), Wideford Hill (Site 218) and Quanterness (Site 506) and these are discussed in detail below. Effects of **minor**/ **moderate** level and less are not predicted to reach the EIA threshold of significance. These effects are summarised briefly below and reported in detail in Appendix 10.2. The assessments of setting that are contained within this chapter and Appendix 10.2 are supported by photomontages and wire frame visualisations (Figures 10.11 – 10.23).

10.9.9 Chambered cairns are considered to have a high relative sensitivity to changes to their settings as they were placed purposefully within the landscape, often in relation to topographical features such as ridgelines, watercourses and coastlines or in relation to other monuments. This is particularly true of Orkney where chambered cairns often have clear visual relationships with bodies of water including the Lochs of Stenness and Harray as well as the firths and channels which interweave between the islands. Both the Cuween and Wideford cairns look out across the Bay of Firth from elevated vantage points whilst Quanterness fronts the Wide Firth from the lower north slopes of Wideford Hill, although this visibility is now impeded by an intervening tree belt. Given the distribution of Neolithic and Early Bronze Age monuments within the expansive Orcadian landscape it is likely that at least some of these monuments were purposively placed in relation to each other and that their settings may therefore be interlinked. In this context it is noted that the positions of both the Wideford and the Quanterness cairns are clearly discernible from the Cuween cairn.

[4] Should the results of the geophysics and trial trenching indicate that further works are required.

[5] For practical reasons it was not possible to visit those designated assets that are located on islands which are not served by Orkney's scheduled public transport service.

However, intervisibility between the Wideford and Quanterness cairns is blocked by the intervening mass of Wideford Hill.

10.9.10 The alignment of burials monuments is also considered to be a factor in understanding the cultural value of the monuments and their settings. The chambers within Neolithic cairns were typically orientated towards their entrances and views from these entrances can often be seen to be focussed on topographical features or watercourses. In some instances, the entrances appear to have been purposefully aligned towards solar events; the entrance passage at Maeshowe (Site 380) is, for example, aligned with the setting of the midwinter sun so that the light illuminates the interior of the chamber. Archaeological evidence also suggests that feasting or other activities took place in front of the entrances at many chambered cairns. Neolithic chambered cairns are therefore considered to be particularly sensitive to changes along the alignments of their internal chambers, passages and entrances.

10.9.11 The Cuween Hill Chambered Cairn (Site 22) is positioned on the ridgeline that extends south-east from the Hill of Heddle 4.36 km to the west of the nearest proposed turbine. It has a central chamber, from which five smaller chambers run. Although the chambers are aligned north to south respecting the alignment of the hillslope into which they are terraced, the entrance passage extends eastwards. The interior of the cairn is well preserved although the majority of the roof has been reconstructed. Panoramic views extend out eastwards from the chamber entrance across the Bay of Firth. Wideford Hill also appears in this view, forming a prominent landmark to the south-east, although the view from within the chamber entrance is more constrained focusing on Wideford Hill itself (Plate 10.5, Appendix 10.3).

10.9.12 As the photomontage (Figure 10.13) indicates, all six turbines will be visible from in front of the chamber entrance at Cuween where they will appear in the middle distance to the left of the existing operational Rennibister turbine. Wideford Hill will appear, distinctly separate to the right and visual interactions with the locations of the two chambered cairns which stand upon it will be not be impeded by the Proposed Development. However, as the photomontage shows the Proposed Development will appear clearly breaking the skyline on the Quanterness peninsula and backdropping views out across the Bay of Firth from the cairn and they will also interact with views of the Wide Firth to the left of the peninsula, and also with the Bay of Kirkwall which can be seen behind the peninsula from this vantage point. The Proposed Development will therefore be an evident presence within the northern marine element of the setting of the Cuween Hill cairn. However, the monument's contextual relationship with the coast and the firths will remain clearly legible as will its visual relationship with Wideford Hill and as a consequence the relationship between the cairn and its setting will be preserved. For these reasons, although the Proposed Development would represent a notable alteration to the setting of Cuween Hill, this would fall beyond those elements of the setting which directly contribute to our understanding of the cairn's cultural value and the overall integrity of the setting would not be adversely affected. The magnitude of this impact would therefore be medium (Table 10.7) and given the cairn's high relative sensitivity (Table 10.5) the level of effect upon its setting would be **moderate** and significant.

10.9.13 Wideford Hill Chambered Cairn (Site 218) lies to the east of Cuween Hill on the north-west slopes of Wideford Hill 1.297 km south of the nearest proposed turbine. The cairn has been terraced into the hillslope in the same manner as Cuween and faces west over the Bay of Firth and the islands beyond. The entrance passageway is also orientated in this direction and this is therefore considered to be its principal setting alignment. Like many Orkney Cairns, Wideford Hill has been rebuilt and re-roofed with concrete and the mound which formerly covered it has also been removed exposing the outer edge of its underlying internal structure.

10.9.14 As the photomontage (Figure 10.12) shows only the two westernmost turbines will be visible at their full height from the Wideford Hill cairn along with the hub and blade of a third, views of the remaining three turbines will be entirely blocked by the intervening presence of the hill itself. Although the Proposed Development will intervene in views north out across the Wide Firth from the cairn, it will be a permeable presence peripheral to the monument's key westward orientation overlooking the more enclosed Bay of Firth and the Cuween – Heddle ridge to its left. The positioning of the cairn on Wideford's western slope suggests that less weight may have been attached to the importance of northward views as these are constrained by the hill. It is also worth noting that the

topographical bowl that forms the core of West Mainland, within which the iconic Stenness and Brodgar monuments lie can be seen in views westward from this vantage point through the gap in the ridgeline between the Hill of Heddle and Snaba Hill. Brodgar and Stenness are a point of reference for many of the monuments on the north part of the mainland, and it is possible that significance could have been attached to this glimpse into the bowl within which they are set.

10.9.15 Although the western portion of the Proposed Development will be clearly visible from the Wideford Hill Cairn, it will appear to the north of the monument's west facing orientation, and views of the both the Bay of Firth and the position of the Cuween cairn will not be directly affected. However, given their proximity to the monument the visible turbines would represent a notable change to the setting of the cairn, albeit one which falls beyond those elements of its setting which directly contribute to our understanding of its cultural value and the overall integrity of the setting would not be adversely affected. The magnitude of this impact would therefore be medium (Table 10.7) and given the cairn's high relative sensitivity (Table 10.5) the level of effect upon its setting would be **moderate** and significant.

10.9.16 The Quanterness chambered cairn (Site 506) lies to the south of the site on the lower northern slope of Wideford Hill 0.68km south of the nearest proposed turbine. Quanterness is the only one of the three chambered cairns not to be in the care of Scottish Ministers and although it has been excavated on a number of occasions, most recently as 1973, the grass mound remains intact (Plate 10.6, Appendix 10.3) and the eastern entrance portal could not be detected during the site visit. The cairn is enclosed by a tree belt which shields the monument from view and hampers views out from it, but as Plates 10.7 and 10.8 (Appendix 10.3) show, does not completely block views either; the presence of the mound can still be detected in external views into the tree belt (Plate 10.7, Appendix 10.3), whilst at least during winter the site and the Wide Firth beyond can still be glimpsed in views north from the mound (Plate 10.8, Appendix 10.3). The tree belt is not shown on either the 1882 or 1903 Ordnance Survey's (Figures 10.9 and 10.9), whilst a published photograph of the 1973 excavation (Crozier et. al. in Richards and Jones et. al. 2016, 200, Figure 8.3) suggests that the tree belt had not been planted at this time. It therefore appears that the tree belt is a recent creation and that historically the cairn's setting was more open than it is at present. A two-fold approach has therefore been undertaken to assess the potential effects of the Proposed Development upon the setting of the cairn; one which considers the effect of its insertion into the monument's current baseline setting which includes the tree belt; and a conjectured assessment which considers the potential effects if the trees were to be removed and open visibility restored. The photomontage (Figure 10.11) has been taken in front of the cairn beyond the stand of trees and thus illustrates the potential impact of the Proposed Development without the tree belt and thus presents a worst-case scenario. It should be noted that the landowner has confirmed that the tree belt will not be removed during the lifetime of the Proposed Development and any trees that fall will be replaced.

10.9.17 Excavation records suggest that the cairn was entered from the east via a long entrance passage, which based on precedents elsewhere on Orkney would suggest that the focus of its setting lay to the east, perhaps with an emphasis on views overlooking the Bay of Kirkwall. In this context the former presence of a possible fourth burial mound or cairn to the east of Quanterness at Saverock (Site 494) is of interest as it could potentially suggest a lost setting relationship between the two monuments. Although northward views out across the Wide Firth would be offset from and perhaps ancillary to this core eastern alignment, they would still have been panoramic, taking in not only the Firth but also the flank of the mainland to the north-west and Shapinsay to the north-east. Based on this it is reasonable assume that without tree cover the Quanterness cairn would have a high relative sensitivity to changes in its setting, which would contribute significantly to the observer's understanding, appreciation and experience of the asset (Table 10.5). As the photomontage (Figure 10.11) shows without the tree cover all six turbines would be clearly visible extending along the Quanterness peninsula to the north of the monument intervening, albeit permeably, in views out across the Wide Firth to the landforms beyond. Without tree cover, the Proposed Development would constitute a notable alteration to the setting of the cairn. However, its historically sensitive east-west axis would not be affected, and the visibility would therefore fall beyond those elements of its setting which directly contribute to our understanding of its cultural value and the overall integrity of the setting would not be adversely affected. Without the tree cover the magnitude of

this impact would therefore be medium (Table 10.7) and given the cairn's high relative sensitivity (Table 10.5) the level of effect upon its setting would be **moderate** and significant.

10.9.18 As Plate 10.8 (Appendix 10.3) illustrates the tree belt will provide considerable screening of views of the Proposed Development to the north meaning that although the turbines will be detectable, visibility will be considerably reduced than it would be for a bare earth scenario. The tree belt has also transformed the setting of the cairn itself, diminishing the wider views and panoramas which made up its authentic setting and placing the cairn within a curtailed enclosed environment where its full extent is revealed only at close quarters. In this context, the tree belt should be seen as a modern intrusion, alien to the asset's authentic context, which moderately compromises the observer's ability to understand the cairn's intended relationship with both its setting and the surrounding landscape. It is therefore reasonable to consider the cairn's current relative sensitivity to be medium and the magnitude of impact that is represented by the Proposed Development to be low. For these reasons, in its current context, with the tree belt extant the magnitude of impact is considered to be low (Table 10.7) and the overall effect upon the setting of the cairn **minor** and not significant.

10.9.19 The assessment has identified **minor/ moderate** effects upon the settings of eight Scheduled Monuments; Burness Broch (Site 23), Hilloch Broch (Site 28), Ingashowe Broch (Site 50), Damsay St. Mary's Chapel (Site 51), the Bishop's Palace, Kirkwall (Site 217), the Earl's Palace, Kirkwall (Site 219), Helier Holm chambered cairn (Site 507) and the Hill of Work long cairn (Site 510). **minor/ moderate** effects are also predicted upon the settings of two Category A Listed Buildings; St. Magnus Cathedral in Kirkwall (Site 297) and Balfour Castle on Shapinsay (Site 516) as well as Balfour Castle's IGDL (Site 559) and the Kirkwall Conservation Area (Site 378). **minor/ moderate** effects fall below the EIA threshold of significance and are discussed in detail in Appendix 10.2. All other assets are assessed as having effects of minor or less significance.

10.9.20 ZTV evidence suggests a potential for distant visibility from the portion of the HONO WHS that lies to the north of the Ring of Brodgar stone circle (Site 566), although not from the Ring of Brodgar itself. Given the high sensitivity of the HONO WHS to changes in its setting and the potential for an effect upon the setting of the HONO WHS, albeit at a distance of over 11 km, and the possible appearance of the Proposed Development in views which include the Ring of Brodgar a transect of four wireframes has been prepared extending northwards from the northern part of the Ring of Brodgar (Figure 10.20). The transect includes points taken on three further non WHS Scheduled Monuments, the Wasbister burial mounds (Site 567, Figure 10.21), the Bookan chambered cairn (Site 568, Figure 10.22) and the Ring of Bookan chambered cairn (Site 569, Figure 10.23, Appendix 10.3) which lie within the buffer zone. These wireframes confirm that there will be no visibility from the Ring of Brodgar, but some distant visibility from the Scheduled Monuments to the north. There is therefore predicted to be no effect upon the setting of the Ring of Brodgar and a marginal magnitude of impact upon the settings of the Wasbister burial mounds and the Bookan chambered cairns. Given their high relative sensitivity to changes to their settings this would result in a non-significant **minor** level of effect upon these individual Scheduled Monuments. Although there is predicted to be no visibility from any of the WHS monuments themselves a marginal impact upon the Brodgar element of the WHS has been identified but given its high relative sensitivity an effect of **minor** significance upon the setting of the WHS has been predicted. This takes account of the possible appearance of the Proposed Development, obliquely and distantly, in views of the Ring of Brodgar from the non-WHS Scheduled Monuments to the north. A full discussion these findings is included within Appendix 10.2.

Decommissioning

10.9.21 The Applicant is seeking in-perpetuity consent for the Proposed Development. In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan.

10.10 Additional Mitigation and Enhancement

10.10.1 A detailed methodology for addressing direct impacts has been described in section 10.8 above and no further mitigation works beyond this will be required. Depending on the results, the proposed investigations have the potential to add to our understanding of Orkney's archaeological heritage and could provide opportunities for further academic studies going forward. The publication of the results would therefore constitute a beneficial enhancement. The LVIA chapter discusses the measures to reduce the appearance or visual presence of the turbines within the wider landscape. As setting effects largely result from the visual presence of the turbines within the landscape the same mitigation measures apply to setting effects on cultural heritage assets.

10.11 Residual Effects

Construction

10.11.1 The Proposed Development has been designed, where possible, to avoid direct impacts on known heritage features. The implementation of the above outlined mitigation measures will prevent inadvertent damage to known heritage assets; and investigate the potential for previously unknown assets. Following the completion of construction no further groundworks would be undertaken. Mitigation will allow for the detailed recording of any remains encountered during the construction phase and the results will therefore enhance our understanding of Orkney's archaeological heritage. However, the predicted direct impacts of high magnitude would remain. The Proposed Development has been designed so as to avoid direct impacts upon any of the prehistoric remains that have previously been recorded on the site, and the only direct effects on known heritage assets will be on non-designated assets with a negligible sensitivity, which will result in residual **minor** non-significant levels of effect. Potential effects on unknown previously unrecorded buried remains cannot be predicted at this stage, although these will be addressed by the proposed mitigation measures.

Operation

10.11.2 The predicted residual impacts on the settings of designated heritage assets will be the same as assessed for the operational and cumulative effects. There would be **moderate** significant residual effects on the setting of the Cuween and Wideford Hill chambered cairns. The landowner has confirmed that the tree belt surrounding Quanterness chambered cairn will be maintained throughout the operational life of the Proposed Development and a minor and not significant residual effect on the setting of Quanterness chambered cairn has been identified. It is acknowledged that a bare earth scenario without the tree belt is a possible, albeit unlikely, future baseline. In such a scenario there would be a **moderate** significant residual effect on the setting of the Quanterness chambered cairn. In each case, the key relationships between the Scheduled Monument and their settings would not be significantly altered and thus the overall integrity of their settings will not be adversely affected.

10.11.3 No other significant residual operational effects are anticipated.

10.12 Cumulative Assessment

10.12.1 As set out above in paras 10.5.24 – 10.5.27, cumulative effects relating to cultural heritage are for the most part limited to indirect effects upon the settings of heritage assets.

10.12.2 With regard to the likely significant cumulative effects on cultural heritage assets, the assessment considers operational, consented and within-planning wind farm developments at distances up to 40 km from the Proposed Development. The location of cumulative developments is shown on Figure 6.11. Developments at the scoping stage are not considered. A full list of the cumulative developments is included in Chapter 6. The cumulative schemes include the operational Burgar Hill, Hammars Hill Rennibister and Crowness Business Park turbines on West Mainland.

10.12.3 Archaeological remains are by their very nature an irreplaceable resource and are subject to threats both within and outwith the planning system. The range of non-development threats is broad and

includes damage through ploughing or coastal erosion. Any archaeological remains which may be present on the site need to be understood within this context of gradual loss which occurs on an Orcadian, regional and national scale. Archaeological investigations allow any loss to be controlled through programmes of recording, sampling and analysis. The consequence of this is that where direct impacts occur through either development or academic research, then our understanding of these assets is enhanced, and the results of these investigations inform our knowledge of Orkney's past. Indeed, our understanding of Orkney's archaeological heritage is itself the cumulative product of the results of numerous investigations undertaken over many generations. Any direct impacts which may result from the Proposed Development would be addressed through the detailed programme of mitigation that has been set out in Section 10.8, which will include comprehensive investigations should this be required, the results of which will contribute to our overall understanding of Orkney's past and therefore create a beneficial cumulative legacy. The significance of the cumulative effect on archaeology during construction combined with other developments or causes of loss will thus be **negligible** and not significant. As such this assessment will focus on the likely significant cumulative effects upon the setting of heritage assets which have the potential to occur during the operational phase.

10.12.4 **Moderate** significant effects resulting from the Proposed Development alone have been predicted on the settings of two Scheduled Neolithic chambered cairns Cuween Hill (Site 22) and Wideford Hill (Site 218) and cumulative visualisations have been prepared for these assets (Figures 10.12 – 10.13, Appendix 10.3) and character of their settings have been described in paragraphs 10.9.10 – 10.9.16 above.

10.12.5 When viewed from the Cuween Hill chambered cairn the Proposed Development will appear in front of the operational Howe and Crowness Business Park as well as the consented Work Farm developments (the rear turbines) with Rennibister in the foreground to the left (Figure 10.13, Appendix 10.3). The rear turbines will appear small and indistinct whilst the Rennibister turbine will appear slightly smaller than the Proposed Development due to its lower blade tip height. Overall the developments within this part of the cumulative baseline are smaller and more limited in scale than the Proposed Development which means that the weight of the effect upon the setting of the Cuween cairn will result from the Proposed Development rather than from the cumulative baseline and no additional cumulative effects are predicted.

10.12.6 Visualisation evidence suggests that three operational developments; Hammars Hill, Burgar Hill and Rennibister, are theoretically visible from the Wideford Hill chambered cairn (Figure 10.12, Appendix 10.3) although the Burgar Hill turbines could not be visually detected during the site visit. The Hammars Hill turbines were visible on the distant horizon, whilst the single Rennibister stands to the west of the Proposed Development and would appear distinctly separate from it. Turbines within the cumulative baseline are both lower than the Proposed Development and are set at a greater distance from the Scheduled cairn, and as such the principal effect will come from the Proposed Development rather than the cumulative schemes. For this reason, no additional cumulative effects are predicted.

10.12.7 Two separate assessments have been made for the setting of the Quanterness cairn; an assessment of the implications of the Proposed Development, with the current tree belt, and a theoretical assessment of its implications in the unlikely event that these trees were felled or lost. The assessment found that with the tree belt the predicted effect of the Proposed Development would be **minor** and not significant. If the tree belt were to be removed the effect would be **moderate** and significant. Given the current limited visibility out from the cairn, visibility of cumulative development would be limited and a **minor** cumulative effect has been predicted. This assessment considers the cumulative implications without tree cover, as a worst-case scenario (Figure 10.11). The wireframe suggests that the operational Howe, Hammars Hill, Burgar Hill and Rennibister turbines could potentially appear in views which take in the Proposed Development, although in practice as shown on the photomontage the Howe and Burgar Hill turbines are unlikely to be detectable. Of the visible installations the Hammars Hill turbines would be of small scale when viewed from this distance whilst the single Rennibister turbine would be offset to the west. It is therefore clear that in the event of the tree cover being removed whilst the Proposed Development was operational then the principal effect upon the setting of the Quanterness cairn would come

from the Proposed Development rather than from the cumulative schemes. For this reason, no additional cumulative effects are predicted.

10.12.8 This assessment has predicted **minor**/ **moderate** effects resulting from the Proposed Development alone upon the settings of eight Scheduled Monuments (Sites 23, 28, 50,51, 217,219, 507, 510, 516 and 559), two Category A Listed Buildings (Sites 297 and 516) and the Balfour Castle IGDL. A full description of these effects and settings of these assets is included within Appendix 10.2. Cumulative visualisations have been prepared for the Burness Broch and Chapel (Site 23) (Figure 10.17), Ingashowe Broch (Site 50) (Figure 10.16), Kirkwall Cathedral kirkyard (Site 297) (Figure 10.18), Balfour Castle (Site 516) (Figure 10.14) and the Balfour Castle IGDL (Site 559) (Figure 10.14).

10.12.9 Balfour Castle (Site 516) stands within its IGDL (Site 559) on the southern coast of Shapinsay and both the visualisations predict a similar level of visibility. The operational Rennibister turbine will appear to the rear of the Proposed Development and will in part be shielded from view by it. The single operational turbine at the Crowness Business Park on the outskirts of Kirkwall, will be seen to the left of the Proposed Development and will appear visually separate from it. When viewed from Balfour the Proposed Development will appear as a turbine cluster within a portion of the view within which and existing operational turbine already stands. The weight of the non-significant effects upon the setting of the castle and its IGDL would therefore result from Proposed Development itself and for this reason no additional cumulative effects are predicted.

10.12.10 The Scheduled remains of three brochs lie on the shores of the Bay of Firth to the west of the Proposed Development; Ingashowe (Site 50) which lies on its southern shore the Hillock Broch (Site 28), at Finstown which stands on its western bank, and Burness broch and chapel which stands on the north coast. Cumulative wirelines have been prepared for Ingashowe (Figure 10.17) and Burness (Figure 10.16). When viewed from Ingashowe the Proposed Development will appear behind the operational Rennibister turbines, which although smaller to the proposed turbines, will appear to be of similar size to them, creating the impression of a single turbine grouping. Although the Howe turbine on Shapinsay could also potentially be visible the visualisation suggests that it is unlikely to be discernible (Figure 10.17). A site visit established that both the Rennibister and the Crowness Business Park turbines will be visible from the Hillock broch although the Crowness Business Park turbine is partially concealed behind an intervening hillslope. The Proposed Development will appear between these two turbines and its turbines will be taller. When viewed from the Burness broch on the north bank of the bay, the Proposed Development will appear in linear form in front of the Work Farm and Crowness Business Park turbines which will appear distant and small scale from this perspective. The Howe turbine on Shapinsay appears to the east, again at a small scale, whilst the Rennibister turbine will appear to the east, distinctly separate from the Proposed Development (Figure 10.17). In all three instances the Proposed Development would appear larger and more distinct than the cumulative schemes and for these reasons no additional cumulative effects upon the setting of these brochs are predicted.

10.12.11 The Scheduled remains of St. Mary's Chapel (Site 51) lie on the northern coast of Damsay, a small uninhabited island within the Bay of Firth. Wireframe evidence (Figure 10.15) suggests that the Howe, Work Farm and Crowness Business Park turbines could potentially appear to the rear behind the Proposed Development although in practice the Work Farm turbines may not necessarily be detectible. The operational Rennibister turbine will also be visible although it will be set considerably to the west of the Proposed Development on the periphery of the line of sight. Overall, the Proposed Development will appear larger and more distinct than the cumulative schemes and for these reasons no additional cumulative effects upon the setting of the chapel monument are predicted.

10.12.12 **Minor**/ **Moderate** effects are predicted on the settings of three assets within the historic core of Kirkwall; the Category A Listed Cathedral (Site 297) and the Scheduled Bishop's and Earl's Palaces (Sites 217 and 219). Site visits indicated that the Proposed Development is likely to be visible from the upper viewing platforms of all three assets although no visibility is predicted from ground level. The site visits suggested that the operational Crowness Business Park turbine will be concealed from view from the Earl's Palace but will be visible from the upper levels of both the Bishop's Palace and the Cathedral tower (Plate 10.9, Appendix 10.3). The predicted visibility will be across a broad complex modern townscape and these views would not be core to their settings which relate primarily to the historic core of the townscape within which all three monuments stand. The

Cathedral's kirkyard is included within its Category A Listing and wireframe evidence confirms that all six turbines would theoretically be visible from the kirkyard although the two left hand turbines would only appear at hub height (Figure 10.19). Comparisons with the images taken during the site visit (Plate 10.10; Appendix 10.3) suggest that the flank of Wideford Hill that can be seen from the kirkyard lies to the left of the Proposed Development and that the turbines will be largely if not entirely concealed from view behind vegetation and the intervening townscape. Any visibility from the kirkyard will thus be extremely limited and clearly outwith its urban context. The Kirkyard shares both the cathedral's designation and its high relative sensitivity. Visibility of elements of the Proposed Development would not materially change an observer's ability to understand and appreciate the Kirkyard consequently any visibility will constitute a low magnitude of impact but given its high relative sensitivity the level of effect from the Proposed Development alone would be **minor**/ **moderate** and not significant. The wireline also suggests that the operational Crowness Business Park, Burgar Hill and Hammars Hill turbines are theoretically visible from the kirkyard although they could not be seen during the site visit undertaken in October 2019. For these reasons no additional cumulative effects upon the setting of these three assets are predicted.

10.12.13 The assessment has also identified the potential for a **minor**/ **moderate** effect upon the Kirkwall Conservation Area (Site 378) this is based on the predicted limited visibility from the Cathedral tower and the upper levels of the Bishops and Earl's palace, the potential for limited visibility from the Cathedral Kirkyard, predicted limited and fleeting visibility from elsewhere within the Conservation Area. The potential for cumulative effects upon the Cathedral. The palaces and the Kirkyard have been discussed above and will remain unchanged with respect to the Conservation Area. When viewed from the Harbour photomontage evidence indicates that the operational Crowness Business Park turbine, will appear within the Proposed, the difference of scale between the two being offset by its closer distance, and the only noticeable difference will be in the length of the blades (LVIA Figure 6.19). Given the limitations of visibility of either the Proposed Development or the cumulative Schemes from within the Conservation Area and the predicted coherent relationship between the Proposed Development and the single operational Crowness Business Park turbine, no additional cumulative effects upon the Kirkwall Conservation Area are predicted.

10.12.14 This assessment has identified the potential for **minor/ moderate** effects upon the settings of two cairns the Hellier Holm chambered cairn (Site 507) and the Head of Work Long Cairn (Site 510), both of which lie at the eastern end of the Wide Firth astride the narrow opening of the 'The String' channel. Hellier Holm lies on an uninhabited island and could not be visited, although the Head of Work on the northern coast of East Mainland was. From this perspective the Proposed Development will appear at a distance of 5.82 km within a wide panorama which includes Wideford Hill and the sea channels to the north, east and south. Those cumulative schemes which are visible within this panorama, most notably the consented Work Farm turbines, are comparatively small players within this broad panorama. Given the small scale of these cumulative schemes no additional cumulative effects upon the setting of these two cairns are predicted.

10.12.15 ZTV evidence indicates that the Proposed Development will not be visible from the Ring of Brodgar stone circle (Site 566, Figure 10.20) although there will be some distant visibility from the Scheduled monuments to the north which lie within the WHS buffer zone including Wasbister burial mounds (Site 567, Figure 10.21), the Bookan chambered cairn (Site 568, Figure 10.22) and the Ring of Bookan chambered cairn (Site 569, Figure 10.23). A number of operational wind energy developments have long been visible from these Scheduled assets, whilst Figures 10.20- 10.23 predict extremely limited visibility of the recently consented Costa Head development. Given that the Proposed Development is predicted to have no effect upon the setting of the Ring of Brodgar, **minor effects** upon the settings of the Wasbister burial mounds, the Bookan chambered cairn, the Ring of Bookan chambered cairn and the WHS, it is not considered that there is a potential for any additional cumulative effects.

10.13 Summary

10.13.1 This chapter identifies the archaeological and cultural heritage value of the site and assesses the potential for direct and indirect effects on heritage assets resulting from the construction, operation

and decommissioning of the Proposed Development. This chapter also identifies measures that should be taken to mitigate predicted adverse effects.

10.13.2 This assessment has identified 17 non-designated heritage assets of prehistoric to post-medieval date on the site, including Neolithic and Early Bronze Age remains, which have previously been excavated within the site at Crossiecrown and Ramberry which could potentially be of national importance. The Proposed Development has been designed so as to avoid all known heritage assets of greater than negligible importance. Minor and non-significant levels of effect are predicted for six probable post-medieval or modern assets of negligible importance on the site.

10.13.3 Planning policies and guidance require that account is taken of potential effects upon heritage features/assets by proposed developments and that where possible such effects are avoided. Where avoidance is not possible, effects on any significant remains should be minimised or offset. Given the potential for presently unknown archaeological remains, in particular of prehistoric and post-medieval date, to survive within the site, a programme of archaeological works designed to avoid inadvertent damage to known remains and to investigate and mitigate against the possibility of uncovering hitherto unknown remains will be undertaken.

10.13.4 Potential operational effects on the settings of all designated heritage assets within 10km of the Proposed Development, as well as the potential effects upon the Heart of Neolithic Orkney World Heritage Site (HONO WHS) which extends beyond this buffer have been considered in detail as part of this assessment. **Moderate** significant effects have been predicted upon the settings of two Scheduled Neolithic chambered cairns; Cuween Hill (Site 22) and Wideford Hill (Site 218) The landowner has confirmed that the tree belt surrounding the Scheduled Neolithic Quanterness chambered cairn (Site 506) will be maintained throughout the operational life of the Proposed Development and a **minor** and not significant residual effect on the setting of Quanterness chambered cairn has been identified. It is acknowledged that a bare earth scenario without the tree belt is a possible, albeit unlikely, future baseline. In such a scenario there would be a **moderate** significant residual effect on the setting of the Quanterness chambered cairn. No direct mitigation, beyond that inherent in the Proposed Development design, is possible for operational (setting) effects.

10.13.5 The implementation of the above outlined mitigation measures will prevent inadvertent damage to known heritage features; investigate the potential for previously unknown features and disseminate the results of archaeological works to the public. The Proposed Development has been designed so as to avoid direct impacts upon the prehistoric remains that have previously been recorded on the site, and based on our current understanding the only direct effects will be on non-designated assets with a negligible sensitivity, which will result in residual minor non-significant levels of effect. Potential effects on unknown previously unrecorded buried remains cannot be predicted at this stage, although these will be addressed by the proposed mitigation measures. There would be a **moderate** and significant residual effect on the settings of the Cuween Hill and Wideford Hill chambered cairns. However, the core components and integrity of their settings would not be adversely affected to the extent that the attributes that led to their designation would be compromised.

10.13.6 The possibility of cumulative effects has been considered and assessed however no additional cumulative effects have been predicted.

Table 10.11 – Summary of Effect

Description of Effect	Significance of Likely Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Construction					
Direct impacts on known non-designated regionally or nationally important archaeological remains present on the site	Minor	Adverse	The Proposed Development has been designed so as to avoid direct impacts upon these three sites at Crossiecrown and Ramberry. All three of which will be fenced prior to the onset of construction with buffers up to 100m employed. The possibility of further previously unrecorded buried archaeological associated with these sites being present elsewhere on the site will be addressed through the mitigation measures that are outlined below.	None	Adverse
Direct impacts on known non-designated remains of negligible importance that are present on the site.	Minor	Adverse	A four-stage mitigation strategy; geophysical survey, trial trenching followed by excavation and post-excavation analysis[6] will be undertaken.	Minor	Adverse
Direct impacts on previously unrecorded non-designated regionally or nationally important archaeological	Major	Adverse	A four-stage mitigation strategy; geophysical survey, trial trenching followed by excavation and post-excavation analysis will be undertaken. Any significant remains will be preserved wherever possible.	Negligible	Adverse

[6] Should the results of the geophysics and trial trenching indicate that further works are required.

Description of Effect	Significance of Likely Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
remains that could be present on the site					
Operation					
Indirect effects on the settings of Wideford Hill and Cuween Hill Scheduled Neolithic chambered cairns;	Moderate	Adverse	None	Moderate	Adverse
Indirect effects on the settings of Quanterness Wideford Hill and Cuween Hill Scheduled Neolithic chambered cairns;	Moderate	Adverse	No practical mitigation measures possible although a tree belt currently impedes the view from the Quanterness cairn. If this tree belt were to be retained then the effect would be considered minor (refer to Appendix 10.4).	Minor	Adverse
Decommissioning					
The Applicant is seeking in-perpetuity consent for the Proposed Development. In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan					

Table 10.12 - Summary of Cumulative Effect

Receptor	Effect	Cumulative Developments	Significance of Cumulative Effect	
			Significance	Beneficial/ Adverse
Cuween Hill chambered cairn, Wideford Hill chambered cairn, Quanterness chambered cairn, Balfour Castle, Ingashowe Broch, Hillock Broch, Burness Broch and Chapel, St Mary's Chapel, Kirkwall Cathedral, Bishop's Pa;ace, Earl's Palace, Kirkwall Conservation Area, Hellier Holm chambered cairn, Head of Work Long cairn	Setting effects	Howe, Crowness Business Park, Rennibister, Hammars Hill, Burgar Hill	No additional cumulative effect	N/A
Unknown archaeological remains	Direct effect	Howe, Crowness Business Park, Rennibister, Hammars Hill, Burgar Hill	Negligible effect	N/A

10.14 References

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1654 Blaeu, *Orkney and Shetland*

1665 Sanson, *Les Isles Orkney*

1745 Moll, *Orkney Shire*

1750 MacKenzie, M., *Pomona or main-land*

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1882 Ordnance Survey, *Orkney, Sheet CII (includes: Evie And Rendall; Kirkwall And St Ola; Shapinsay)*, Surveyed: 1879-80, Published: 1882

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Aerial Photographs

Library Reference	**Sortie**	**Date**	**Frame Run/ Photo Number**	**Barcode Reference**
SCOT B_0157	CPE/Scot/UK/0188	10/10/1946	4123 to 4126 and 4175 to 4178	SB_001100
SCOT B_0253	LEU/UK/0002	16/04/1948	7082 to 7086	SB_001527
SCOT B_0563	543/1663	23/02/1962	0270 to 0280	SB_002391
SCOT C_0050	CPE/Scot/UK/0188	10/10/1946	5034 to 5036,	SB_002865
SCOT C_0094	543/1663	23/02/1962	0072 to 0074	SB_002919
SCOT C_0212	ASS/60687	26/06/1987	302 to 303	SB_003079
SCOT 05_06_01	OS/64/220	25/09/1964	035 to 038	SB_003710
SCOT OS_06_02	OS/64/146	22/08/1964	034 to 035	SB_003706

Library Reference	Sortie	Date	Frame Run/ Photo Number	Barcode Reference
SCOT OS_06_02	OS/63/045	26/04/1964	043 to 047	SB_003661
SCOT OS_06_05	OS/70/195	01/06/1970	015 to 016	SB_004537