



Chapter 13

Cultural Heritage

Wessex Archaeology

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13 Cultural Heritage

13.1 Introduction

1. This chapter of the EIA Report presents an assessment of the potential impacts upon the setting of archaeology and cultural heritage receptors, both onshore and offshore arising, from the construction, operation and decommissioning of the Project, as detailed in Chapter 4: Project Description (at the site location illustrated in Figure 13.1 (Volume 2)).
2. The assessment is based upon a combination of the understanding of the Project in terms of the potential for impact and the resultant effects on receptors that were identified within the study area.
3. This chapter is comprised of the following elements:
 - A summary of relevant policy, guidance and legislation;
 - Details of the baseline data sources used to characterise the study area;
 - A summary of the relevant consultations with stakeholders;
 - A description of the methodology for assessing the impacts of the Project, and approach to the assessment of potential effects;
 - A review of the baseline conditions;
 - A description of the worst-case design scenario relevant to archaeology and cultural heritage;
 - An assessment of the likely effects for the construction, operation and decommissioning phases of the Project, including cumulative effects;
 - Identification of any further mitigation measures or monitoring requirements in respect of any significant effects; and
 - A summary of the residual impact assessment determinations taking account of any additional mitigation measures identified.
4. In addition to the assessment on settings this chapter presents a refresh of baseline information following data requests to the UK Hydrographic Office (UKHO), Historic Environment Scotland (HES), Angus Historic Environment Record (AHER), East Lothian Historic Environment Record (ELHER) and Fife Historic Environment Record (FHER). The refresh of the maritime archaeology baseline has been used to inform the Project embedded mitigation strategy (see Section 13.7.1) to ensure the adequacy of the mitigation measures assumed for the Project.

13.2 Policy, Guidance and Legislation

5. In undertaking the assessment, the following legislation has been considered (see Table 13.1 for more details):
 - Ancient Monuments and Archaeological Areas Act 1979;
 - Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997; and,
 - Marine (Scotland) Act 2010.
6. The principal policy documents and information used to inform the assessment of potential impacts on archaeology and cultural heritage are as follows:
 - Scottish Planning Policy (SPP) (The Scottish Government, 2014);
 - Scotland's National Marine Plan (The Scottish Government, 2015); and
 - Historic Environment Scotland (HES) Policy Statement (HES, 2016a);

Table 13.1: Legislation and policy context.

Policy / Legislation	Key Provisions	Section where requirement is addressed
Ancient Monuments and Archaeological Areas Act 1979	Legal protection for scheduled cultural heritage receptors of national importance.	Impacts to the setting of scheduled cultural heritage receptors of national importance are discussed in Section 13.7.2. These are identified in Section 13.6.1.
Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997	Legal protection for designated cultural heritage receptors of local, regional and national importance.	Impacts to the setting of cultural heritage receptors of national importance are discussed in Section 13.7.2. These are identified in Section 13.6.1.
Marine (Scotland) Act 2010	Provides for the establishment of national and regional marine plans and for offshore sites of national importance to be designated as Historic Marine Protected Areas.	The need for mitigation against impacts on identified archaeological and cultural heritage receptors is addressed in Section 13.7.1 and Section 13.9.
Scottish Planning Policy (SPP) 2014	Sets out the role of the planning system in protecting ancient monuments, archaeological sites and landscapes.	The standards and guidance within this document are applied to all discussions of impacts on cultural heritage receptors in Section 13.7.2.
Scotland's National Marine Plan 2015	This includes statements on the need for appropriate mitigation of offshore development on cultural heritage (General Planning Principle 6 in Chapter 4 of the document).	The need for mitigation against impacts on identified archaeological and cultural heritage receptors is addressed in Section 13.7.1 and Section 13.9.
HES Policy Statement	Sets out guidance for the implementation of SPP 2014 in relation to the Historic Environment.	The standards and guidance within this document are applied to all discussions of impacts on cultural heritage receptors in Section 13.7.2.

7. Additional guidance documents utilised to inform the assessment of potential impacts on archaeology and cultural heritage are as follows:
- Planning Advice Note 2/2011: Planning and Archaeology (The Scottish Government, 2011);
 - Managing Change in the Historic Environment: Setting (HES, 2016b);
 - The Code of Practice for Seabed Developers (The Joint Nautical Archaeology Policy Committee (JNAPC), 2006);
 - Collaborative Offshore Wind Research Into the Environment (COWRIE), Historic Environment Guidance for the Renewable Energy Sector (Wessex Archaeology, 2007);
 - COWRIE Guidance for Assessment of Cumulative Impact on the Historic Environment from Offshore Renewable Energy (Oxford Archaeology, 2008); and
 - Standard and Guidance for Desk Based Assessment (Chartered Institute for Archaeologists, revised 2014).

13.3 Data Sources

8. The assessment considers the potential interaction between the Project, as described in Chapter 4: Project Description, cultural heritage receptors within the study area as required by the Scoping Opinion.
9. The cultural heritage study area for the setting analysis of onshore cultural heritage receptors is defined by the zone of theoretical visibility (ZTV) of the Offshore Wind Farm using the maximum blade tip height.
10. The cultural heritage study area for refreshing the maritime archaeological baseline was the Development Area and Export Cable Corridor plus a 1 km buffer.
11. Baseline characterisation data has been collated combining a thorough desk-based study of extant Historic Environment Record (HER) data supplemented with a series of site visits to selected designated onshore cultural heritage assets detailed in the Scoping Opinion and agreed through further consultation with stakeholders (see Section 13.4). Table 13.2 details the data sources used to inform the baseline characterisation within the study area.

Table 13.2: Data sources used to inform the baseline description

Data Source	Study/Data Name	Overview
UK Hydrographic Office (UKHO)	Data request from UKHO dataset. Requested by WA.	Data request for Recorded Wrecks and Obstructions within the marine archaeology study area.
Historic Environment Scotland (HES)	Data request from HES dataset. Requested by WA.	Data request for Recorded Losses, maritime and aviation archaeology, and cultural heritage receptors within the study areas.
FHER	Data request from FHER dataset. Requested by WA.	Identification of archaeology and cultural heritage receptors likely to have their setting changed due to Project construction/operation.
AHER	Data request from AHER dataset. Requested by WA.	Identification of archaeology and cultural heritage receptors likely to have their setting changed due to Project construction/operation.
ELHER	Data request from ELHER dataset. Requested by WA.	Identification of archaeology and cultural heritage receptors likely to have their setting changed due to Project construction/operation.

12. NnGOWL commissioned site-specific geotechnical and geophysical surveys which were carried out in the vicinity of the Development Area, and data requests from national and regional repositories for recorded archaeology and cultural heritage receptors were made. Figure 13.2 (Volume 2) presents the known cultural heritage assets with proposed Archaeological Exclusion Zones (AEZs). Regional collaborative studies on sediment movement were also commissioned jointly by NnGOWL and Inch Cape Offshore Limited (ICOL) covering the outer Firth of Forth and Tay area in and around the Development Area and the Inch Cape Offshore Wind Farm.
13. WA conducted site visits to each of the identified onshore receptors for the setting analysis, as well as utilising wirelines and photomontages provided by the NnGOWL commissioned SLVIA consultants LUC.

13.4 Relevant Consultations

14. As part of the EIA process, NnGOWL has consulted with various, relevant statutory and non-statutory stakeholders. A formal scoping opinion was requested from MS-LOT following submission

of the Scoping Report. In response to NnGOWL's request, MS-LOT issued a Scoping Opinion within which HES noted that a re-assessment of impacts on marine archaeology was not required and therefore should be scoped out. It was subsequently confirmed that MS-LOT were also of this opinion. Additionally, all potential physical cultural heritage should be scoped out, as identified seabed features and submerged prehistory are mitigated for by the inclusion of the embedded mitigation (Section 13.7.1).

15. MS-LOT also identified a number of issues that could not be scoped out of the assessment. Table 13.3 summarises the comments received from stakeholders and where they have been addressed within this EIA in respect of archaeology and cultural heritage.

Table 13.3: Summary of consultation relating to archaeology and cultural heritage.

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
08/09/17, Scoping Opinion – Scottish Ministers	The Scottish Ministers agreed that the existing data available, with the proposed updated data requests as noted in the Scoping Report, to describe the archaeology and cultural heritage baseline were sufficient to inform this EIA.	See Section 13.6
	The Scottish Ministers agreed that, with the exception of blade tip height, the assessment scenario previously applied in conducting the Original EIA represents the worst-case scenario when compared to the project design envelope for the Project. The Scottish Ministers noted that impacts on the setting of cultural heritage assets from the potential increase in blade tip height should be scoped into the EIA for the Project and recommended that NnGOWL provide justification for the worst-case scenario considered in the assessment.	See Section 13.8
	The Scottish Ministers agreed that the embedded mitigation described within the Scoping Report provides a suitable means for managing and mitigating the potential effects of the Project on the archaeology and cultural heritage receptors. The Scottish Ministers noted the concerns of East Lothian Council (ELC) and recommended that NnGOWL describe how the embedded or other potential mitigation strategies will suitably manage and mitigate the potential effects.	See Section 13.7.1
	The Scottish Ministers agreed that an updated settings analysis, in conjunction with any updated Seascape Landscape and Visual Impact Assessment (SLVIA) is required. The Scottish Ministers also noted the concerns of Angus Council with respect to Bell Rock lighthouse and Arbroath signal tower and recommended that NnGOWL continue discussions with appropriate stakeholders with regard to setting changes.	See Section 13.6
	The Scottish Ministers agree that the cumulative effects on archaeology and cultural heritage receptors should be scoped in to the Project EIA only where it applies to impacts on the settings of cultural heritage assets, based on the increase in turbine size for the Project.	See Section 13.8.4

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
08/09/2017, Scoping - HES	<p>HES confirm that there are no marine or terrestrial heritage assets within their remit located within the Development Area.</p> <p>HES note that it is proposed to scope direct impacts on marine archaeology out of the EIA assessment. In light of the previous survey work undertaken, and the detailed baseline data available, HES are content that this is acceptable for their interests.</p> <p>HES welcome the identified mitigation measures for direct impacts. These include AEZs, a written scheme of investigation (WSI), and a protocol for archaeological discoveries (PAD). HES would be happy to provide comments on any of these elements of the scheme</p>	N/A
	<p>HES can confirm that there are a number of terrestrial heritage assets within a seascape setting in the vicinity of the Development Area which may be affected by the Project.</p> <p>There is the potential for cumulative impacts on the setting of terrestrial heritage assets caused by the development of the Project both alone and cumulatively with other existing and proposed offshore wind farms in the area. In this case, HES also recommend that cumulative impacts be carefully considered.</p> <p>HES welcome the fact that impacts on the setting of cultural heritage assets are to be scoped in to the assessment, and that reference has been made to HES' revised Managing Change guidance note on 'setting' in the Scoping Report.</p> <p>HES also note that potential cumulative effects have also been identified for assessment. HES support this approach and also welcome where it is proposed to ensure that appropriate mitigation is embedded into the Project.</p>	See Sections 13.6 and 13.8
08/09/2017, Scoping - East Lothian Council	<p>In terms of the historic environment, ELC notes that indirect setting impacts on East Lothian are scoped in and supports this.</p> <p>The indirect impacts should be identified by first producing a ZTV and identifying the heritage receptors, which need to be further assessed. This should be done in consultation with East Lothian Council Archaeology Service (ELCAS). ELC note that, although complimentary, a Heritage Assessment is not the same as a LVIA assessment.</p>	See Sections 13.6 and 13.8.2 and Chapter 14: SLVIA
	<p>With regard to existing data, ELC agrees that the baseline data from UKHO, HES and the two council Historic Environment Records will need to be refreshed.</p>	See Section 13.6
	<p>ELC states that it is not clear that the embedded mitigation described provides a suitable means for managing and mitigating the potential effects of the Project on the archaeology and cultural heritage receptors.</p>	The refresh of baseline information has been undertaken to confirm the adequacy of the embedded mitigation, see Section 13.7.1.
	<p>ELC request that the impact of turbine height and layout to the setting of onshore receptors be reassessed because of the increase in turbine height, and any potential mitigation strategies for indirect impacts should be included within the EIA as appropriate.</p>	See Section 13.8.2

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
	ELC agrees that the changes in turbine number and increase in blade tip height require an updated Settings analysis, in conjunction with any updated SLVIA analysis. This should include producing a ZTV and identifying the onshore heritage receptors, which need to be further assessed, in consultation with ELCAS. It should be noted that additional heritage specific visualisations may be required in the updated setting assessment.	See Section 13.8.2
	ELC agrees that the cumulative effects on archaeology and cultural heritage receptors should be scoped in to the Project EIA only where it applies to impacts on the settings of cultural heritage assets, based on the increase in turbine size for the Project.	See Section 13.8.4
26/10/2017. ELCAS additional Scoping clarifications via email	ELCAS response on whether additional sites should be assessed in East Lothian for setting effects. They have requested additional setting assessment on five sites within East Lothian, as follows: <ul style="list-style-type: none"> ▪ Dunbar Battery; ▪ Dunbar Castle and Castle Park; ▪ Tantallon Castle; ▪ North Berwick Law; and ▪ Doon Hill Forts. 	See Sections 13.6 and 13.8.2
08/12/2017 MS-LOT – Scoping clarifications via email	MS-LOT confirmed on behalf of the Scottish Ministers that direct physical impacts on maritime archaeology receptors can be scoped out of the assessment.	n/a

16. The Scoping Report set out embedded mitigation, which will be incorporated into the Project at the design phase to mitigate any risk to archaeology and cultural heritage receptors (NnGOWL, 2017). The embedded mitigation was considered by MS-LOT in determining the scope of this assessment.
17. Although the assessment will focus on the potential impacts to setting of designated onshore and island cultural heritage receptors as agreed in the Scoping Opinion, the Project embedded mitigation, set out in Section 13.7.1, details the full list of measures relevant to marine archaeology that NnGOWL will implement during the Project lifecycle.

13.5 Impact Assessment Methodology

18. This assessment considers the potential impacts associated with the construction, operation and decommissioning of the Project and the effects on the setting of archaeology and cultural heritage receptors, both onshore and offshore (Figure 13.3 (Volume 2)). The impact assessment process and methodology follows the principles and general approach outlined in Chapter 6: EIA Methodology. The methodology and parameters assessed have also taken into account issues identified through consultation with stakeholders as detailed in Section 13.4 and the understanding of baseline conditions informed by the data sources referenced in Section 13.3.
19. The Project Description (Chapter 4) and the project activities for all stages of the project life cycle (construction, operation and decommissioning) have been assessed against the archaeological and cultural heritage baseline to identify the potential interactions between the Project and the relevant receptors. These are known as the potential impacts and are then assessed to determine a level of significance of effect upon those receptors.
20. The methodology for the assessment of setting impacts upon the cultural heritage receptors has been undertaken with reference to current guidance *Managing Change in the Historic Environment: Setting* (HES, 2016b). The approach taken is to:

- Identify the cultural heritage assets that might be affected;
 - Define the setting of each asset (without reference to the Project); and
 - Assess how the Project would impact upon this defined setting.
21. Cultural heritage receptors have been defined through a process of stakeholder consultation, as outlined in Section 13.4. The setting of these receptors was established through site visits to all assets in July and August 2017 excluding the Bell Rock Lighthouse (HB no. 45197), which was inaccessible, and the sites in East Lothian which were reviewed using the wireline models provided by LUC only. The potential magnitude was assessed in conjunction with SLVIA wireline models and photomontages in Section 13.8.4.
 22. Most of the selected archaeology and cultural heritage receptors (or nearby locations) were also analysed in the SLVIA (Chapter 14). This assessment concentrates on the cultural heritage setting impacts, which are distinct from the aesthetic heritage setting impacts discussed within Chapter 14: SLVIA, and are identified using cultural heritage specific guidance (e.g. HES, 2016b). This setting assessment has been conducted to identify potential changes in setting which may affect the cultural heritage significance of individual receptors, distinct from the aesthetic landscapes and seascapes discussed in Chapter 14: SLVIA. There is therefore no correlation between the magnitude and significance of setting impacts identified within each chapter, even if a receptor is analysed in both.
 23. Setting as defined in the HES guidance (2016b) includes both visual factors and the contributions of the surroundings to the experience, understanding and appreciation of a cultural heritage asset. It is noted that the distances between the Wind Farm Area and the onshore receptors are considerable in almost all cases. Any significant indirect impacts on the setting of receptors that do not directly reference the sea due to their historic function will therefore only be considered minor impacts.
 24. The assessment of the impact to the setting of cultural heritage receptors remains rooted in the professional judgement of the assessor; however, a number of key factors can be noted which are considered in defining the setting of a receptor. These include the prominence of the receptor within views of the surrounding area, key vistas from the receptor and the relationship between built and natural features. The assessment of setting effects on a cultural heritage receptor is therefore complex and not simply a function of the proximity or intervisibility of the development in question.
 25. It is also noted that impacts on setting relating to the construction and decommissioning of the Wind Farm and Offshore Export Cable will be short term and temporary. The assessment of setting impacts therefore focuses solely on the operational impacts arising from the Wind Farm.

13.5.1 Assessment and Assignment of Significance

26. The sensitivities of the setting of archaeology and cultural heritage receptors are defined variously by their potential sensitivity to an impact, their recoverability and importance of the receptor.
27. The potential importance of a receptor to setting changes is firstly based on relevant statutory designations e.g. scheduling under the Ancient Monuments and Archaeological Areas Act 1979 or Category 'A' listed buildings through the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 or through non-statutory designations e.g. Inventory Battlefields and Inventory Gardens and Designed Landscapes. These are all considered as nationally important, with all nationally designated receptors assigned as being of high importance.
28. In accordance with the Scottish Government and local historic environment and planning policies noted in Section 13.2, while designation indicates that a receptor has been identified as being of high value, non-designated heritage assets are not necessarily of lesser importance. Relatively few archaeological sites are designated, and non-designated receptors that can be demonstrated to be

of equivalent value to designated sites should be considered subject to the same policies. The value of non-designated receptors is therefore attributed based on the historical importance at an international, national, regional or local scale and the potential for identifying alternative examples of the receptor.

29. The sensitivity of a receptor to setting impacts can be more finely assessed through site visits and analysis of the surroundings of the site, for example, does it have intervisibility with the Offshore Wind Farm? Does it specifically reference the Offshore Wind Farm Area or deliberately ignore it? Is the view important to the function and/or appreciation of the site?
30. To inform the potential level of change induced by the Offshore Wind Farm, wireline models and photomontages showing the Offshore Wind Farm from a given viewpoint, within or close to the receptor, are also consulted. It is noted that the setting impacts will cease upon decommissioning of the Project, which would give all impacts a high degree of recoverability; however, all operational impacts should be assumed to be at least semi-permanent in relation to the operational life of the Project (i.e. 50 years). The definitions of terms relating to setting of archaeology and cultural heritage are detailed in Table 13.4 below.

Table 13.4: Definition of term relating to the environmental value (sensitivity of the receptor) (adapted from Highways Agency et al., 2008).

Value (sensitivity of the receptor)	Description
High	High or very high importance and rarity (World Heritage Sites, Scheduled Monuments, Category A Listed Buildings, some Inventory Battlefields), Receptor known and valued on an international or national scale, limited potential for substitution.
Medium	High or medium importance and rarity (Category B Listed Buildings, some Inventory Battlefields, Historic Gardens and Designed Landscape), Receptor known and valued on a regional scale, limited potential for substitution.
Low	Low or medium importance and rarity (Category C Listed Buildings, non-designated buildings of local interest), Receptor known and valued on a local scale.
Negligible	Very low importance and rarity (non-designated buildings of limited local interest) Receptor known and valued on a local scale.

31. The magnitude of impact is defined by a series of factors including the spatial extent of any interaction, the likelihood, duration, frequency and reversibility of a potential impact. The definitions of the levels of magnitude used in this assessment in respect of the setting of archaeology and cultural heritage are described in Table 13.5.
32. The magnitude of an impact considers the level of change to a receptor's setting - the magnitude of a 4-storey building in close proximity to the asset would be judged to potentially induce a larger magnitude adverse impact than a 20-storey building four miles away. Several factors can affect the overall magnitude of an impact including:
 - Obstruction of or distraction from key views - some assets are placed deliberately in the landscape to be afforded a certain view which visitors can still enjoy e.g. prehistoric tombs overlooking a particular bay or the designed vista of a country house;
 - Changes in prominence - Assets can be placed on a prominent place in the landscape, which is key to their importance and experience e.g. ridgetop cairns and castles on hilltops;
 - Changes in landscape character - Assets may be linked to a particular land use, the changing or removal of which may compromise their setting and the importance of the asset as a whole e.g. the extra-mural fortifications of a town are of significance to the defensive town wall;

- Duration of impact - the longer the impact will continue, the larger the magnitude of the impact will be; and
- Reversibility of impacts - if the setting will be restored at the end of the development or can be easily reversed then it will be of lesser magnitude than an irreversible change.

Table 13.5: Definition of terms relating to the magnitude of impacts (adapted from Highways Agency et al., 2008)

Magnitude of impact	Description (adverse effects)	Description (beneficial effects)
High	Comprehensive, long term or permanent negative changes to the defined setting.	Comprehensive, long term or permanent positive changes to the defined setting.
Medium	Considerable negative medium/long term semi-permanent or long term temporary changes that affect the character of the receptor.	Considerable positive medium/long term semi-permanent or long term temporary changes that affect the character of the receptor.
Low	Minor medium/short term temporary or semi-permanent negative change that partially affect the setting of the receptor.	Minor medium/short term temporary or semi-permanent positive change that partially affect the setting of the receptor.
Negligible	Very minor or negligible temporary or semi-permanent negative change to the defined setting of the receptor.	Very minor or negligible temporary or semi-permanent positive change to the defined setting of the receptor.
No change	No change to the defined setting of the receptor in either direction.	

33. The magnitude of the impact is correlated against the sensitivity of the receptor to provide a level of significance. For the purposes of this assessment any effect that is considered major or moderate is considered to be significant in EIA terms (Table 13.6). Any effect that is minor or below is not considered significant.

Table 13.6: Significance of potential effects

		Magnitude			
		High	Medium	Low	Negligible
Sensitivity	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

34. The definitions of the levels of significance are provided in Table 13.7.

Table 13.7: Significance of impacts

Impact	Description (judgement based on receptor sensitivity and impact magnitude)	Impact significance (EIA Regulations)
Major	Impacts are likely to be highly noticeable and have long-term effects, or permanently alter the character of an internationally or nationally important asset's setting and are likely to disrupt the status and/or value of the receptor. Mitigation likely to be required to reduce or avoid significant effects.	Significant

Impact	Description (judgement based on receptor sensitivity and impact magnitude)	Impact significance (EIA Regulations)
Moderate	Impacts are likely to be noticeable and result in lasting changes to the character of a nationally or regionally important asset's setting and are likely to disrupt the status and/or value of the receptor, although the overall value of the overall baseline is not disrupted. Mitigation may be required to reduce or avoid significant effects.	Significant
Minor	Impacts are expected to comprise changes to the character of a regionally important asset's setting but are not expected to cause long term damage to the value of the receptor. However, such impacts may be of interest to stakeholders and / or represent a contentious issue during the decision-making process, and should therefore be avoided or mitigated as far as reasonably practicable.	Not significant
Negligible	Impacts are expected to be of minor consequence to a locally important asset's setting, with minimal changes overall. These impacts do not require mitigation and are not anticipated to be a stakeholder concern and/or a potentially contentious issue in the decision-making process.	Not significant

13.5.2 Uncertainty and Technical Difficulties Encountered

35. This assessment has been conducted in consideration of the worst-case design scenario and, therefore, considers the maximum impact on cultural heritage assets. This also reduces the risk of later design changes falling outside the scope of this assessment.
36. It is judged that the data utilised in the assessment of scoped-in receptors, i.e. setting effects supported by SLVIA wirelines and other modelled outputs and site visits, are sufficient for the assessment. The receptors which were visited during poor weather were all either revisited in better weather or analysed using photomontages from the SLVIA consultants LUC which were taken during better weather. Therefore, we consider there are no significant uncertainties and technical difficulties that would affect the significance assigned in the assessment process.
37. It was impossible to conduct a site visit to the Bell Rock Lighthouse. It is considered that the main setting of this receptor is based around its interaction with the Arbroath signal tower, which was revisited in better weather on 11/08/2017, and as the lighthouse itself is inaccessible to the public, it is appropriate to discuss its setting only in connection with the Arbroath signal tower.

13.6 Baseline Description

38. This section contains the results of the archaeology and cultural heritage baseline assessment. All receptors are also included in Appendices 13.1 and 13.2.
39. As proposed in the Scoping Report, a review of updated datasets from the UKHO was undertaken to establish if additional information on maritime assets was available; no new data was encountered in relation to the existing baseline gazetteer. The known archaeology and cultural heritage receptors within the Development Area are shown in Figure 13.2 (Volume 2).
40. As agreed in the Scoping Opinion, impacts to seabed prehistory, maritime and aviation archaeology resulting from construction, operation and decommissioning have been scoped out of the assessment. Therefore, the following section will refer to setting impacts during the operational phase only. Receptors identified for setting analysis are numbered using their relevant designation/catalogue number.

13.6.1 Setting: Designated Onshore and Island Cultural Heritage Receptors

41. The Offshore Wind Farm Area will be visible from a number of designated cultural heritage receptors, both on the mainland of Fife, Angus and East Lothian and on the Isle of May and Bell Rock. The Scoping Response from Historic Environment Scotland lists eleven receptors with a “*seascape setting*”, to which we have added a site, which has a setting explicitly referencing one of these sites. A further five sites were added in on consultation with ELCAS. Accordingly, the following sites have been assessed for setting impact (Figure 13.3 (Volume 2)):

13.6.1.1 Scheduled Monuments:

- Tentsmuir coastal defences (Index no. 9712);
- Crail Airfield, airfield 1 km E of Kirklands Farm (Index no. 6642);
- Crail Airfield, pillbox, Foreland Head (Index no. 6461);
- St Andrews Castle (Index no. 90259);
- St Andrews Cathedral and adjacent ecclesiastical remains (Index no. 90260);
- Isle of May Old Lighthouse (Index no. 887);
- Isle of May Priory (Index no. 838);
- Dunbar Castle and Castle Park (Index no. 766; Index no. 5960);
- Tantallon Castle (Index no. 13326);
- North Berwick Law (Index no. 3863); and
- Doon Hill forts (Index no. 5764).

13.6.1.2 Category A Listed Buildings:

- St Andrews Harbour (Historic Building (HB) no. 40596);
- Bell Rock Lighthouse (HB no. 45197);
- Arbroath signal tower (HB no. 21230); and
- Dunbar Battery (Listed Building (LB) no. 24831)

13.6.1.3 Gardens and Designed Landscapes:

- St Andrews Links (Garden and Designed Landscape (GDL) no. 00344); and
- Cambo Estate Designed Landscape (GDL no. 00080).

42. The Category ‘A’ listed Arbroath signal tower (HB no. 21230) in Arbroath has been assessed due to its explicit connection to the Bell Rock lighthouse.

13.6.1.3.1 Tentsmuir Coastal Defences

43. Tentsmuir coastal defences are a complex of World War II (WWII) coastal defences built because the low sandy coastline of the area was considered to be at risk from a sea-borne invasion. The scheduled area is in two parts, a large coastal strip of over 500 hectares (ha), extending over 6.6 km from north to south, and 4 km from east to west. This area contains a wide variety of defences most of which are dispersed along the back-beach of the prograding shoreline, east of Tentsmuir Forest. These include anti-glider posts, lines of anti-tank blocks, command posts, quadrant towers and pillboxes. Inland to the west of this is the site of a former army camp built for those who constructed and monitored the line, many of whom were Polish forces. The camp is situated within forest and is 590 m on its north-south axis and 190 m on its east-west axis.
44. The setting of these defences is clearly referencing the open sea, protecting Angus, Fife and the Tay Estuary from a sea-borne invasion during WWII, and so a clear vista out to sea is part of the heritage of the site as a whole. Changes that restrict this open view would potentially have an impact on the significance of the receptor. The area of defences themselves are within a thick forest, split by paths and tracks, with the coastal defences overlooking an expanse of sand dunes, a flat sandy beach and the open sea (Figure 13.4 (Volume 2)).

13.6.1.3.2 Crail Airfield

45. The airfield, built during WWI and recommissioned by the Royal Navy in WWII as a torpedo bomber training airfield for carrier-based crews, is considered one of the best-preserved WWII airfields in the UK, with almost all the hangars, outbuildings and other features remaining. It currently is used for drag and kart racing, and houses a small museum, which is occasionally open. The setting of the airfield clearly was important for the Royal Navy, who were able to conduct training for their carrier pilots close to the RN base at Rosyth. Despite this, as the airfield was neither a fighter station nor a coastal command station, the overall views out to sea are not integral to the setting of the airfield, which is more based on the flat landscape at this point in the East Neuk (Figure 13.5 (Volume 2)) and its relative proximity to Rosyth.

13.6.1.3.3 Crail Airfield Pillbox

46. This is a concrete pillbox of WWII date at the tip of Fife Ness. It comprises a pillbox with stone walls, steel lintels, and a concrete roof into which stone was set for camouflage, set at the base of a small cliff below the Fife Ness lighthouse (Figure 13.6 (Volume 2)). It commands views out into the North Sea as an observation post and coastal defence installation, and these views out to sea are integral to the function and setting of the pillbox.

13.6.1.3.4 St Andrews Castle

47. St Andrews Castle is a Property in Care, a Category A-Listed Building and a Scheduled Monument. It was first mentioned in 1200 but the present fabric largely dates to the 14th to 16th centuries. It takes the form of a partially ruined tower with an enclosure. The castle is built on a slight promontory of the rocky shoreline a few hundred metres to the northwest of the cathedral, with views out into the North Sea which are partially integral to the setting of the castle (Figure 13.7 (Volume 2)).

13.6.1.3.5 St Andrews Cathedral

48. St Andrews Cathedral is a Property in Care, a Category A-Listed Building and a Scheduled Monument. The site consists of a large walled complex of buildings including a partially ruined cathedral. The cathedral occupies a prominent position in St Andrews on an elevated site overlooking the harbour and dominating views of the town, particularly through the high visibility of its towers. The cathedral grounds are surrounded to the north, east and south by a high stonewall containing memorials on the inner face, meaning that the view out to the sea is blocked within the grounds of the cathedral and only visible from the top of the tower (Figure 13.8 (Volume 2)).

13.6.1.3.6 Isle of May Old Lighthouse

49. The Old Lighthouse on the Isle of May is a Scheduled Monument made up of the remains of a white harl painted coal-fired lighthouse built in 1636, originally 12.2 m high and square in plan. It has been reduced over time to 7.3 m. It is situated on the highest point of the Isle of May, commanding extensive views across the sea in all directions, except for to the southwest where the view is compromised by the current lighthouse. The view out to sea is evidently integral to the setting and purpose of the lighthouse, as it needed to have intervisibility with ships out at sea (Figure 13.9 (Volume 2)).

13.6.1.3.7 Isle of May Priory

50. The priory on the Isle of May is located on the southwest side of the Isle. It is a Scheduled Monument including the upstanding and excavated remains of the St Adrian's Benedictine priory, dating to the 13th Century. The main upstanding structure belongs to the Priory's accommodation, with lancet windows to the north, containing a roughly dressed font. Excavations by GUARD in the

1990s (James and Yeoman, 2008) uncovered the full ground plan of the priory, which remains exposed for visitors. The site sits above the small harbour to the east and below two hills to the west in a sheltered dip (Figure 13.10 (Volume 2)). It has open views to the east, with more restricted views to the north and west obscured by the terrain of the Isle and the more recent lighthouse buildings. The views out to sea are important but not necessarily integral to the setting of the priory, as the function of the buildings was at least in part insular.

13.6.1.3.8 *Dunbar Castle and Castle Park*

51. The ruins of Dunbar Castle stand scattered on a high rock to the west of Victoria Harbour. They are the remains of a 15th century castle with curtain wall and gatehouse, with later round gunports in some of the sea facing walls. The castle ruins were heavily damaged when the entrance to the Victoria Harbour was cut through the rock spur in the 19th century. The setting of the monument is centred around its position on the rock above the town of Dunbar and the harbour, and while the views out to sea are of some significance to the setting, they are not totally integral to it (Figure 13.11 (Volume 2)).
52. Below the ruins of the castle, the remains of an Iron Age promontory fort were found, as well as potential for early medieval occupation. The castle and later changes have almost totally compromised the setting of these features.

13.6.1.3.9 *Tantallon Castle*

53. Tantallon Castle is a well preserved medieval castle on a promontory above the Forth made up of a massive curtain wall with D-towers and a central gatehouse cutting off a small promontory. The internal features of the castle have been lost to coastal erosion during the last 300 years. Further out, Civil War era defences are also present (Figure 13.12 (Volume 2)). The monument is isolated, with its setting above the Forth being key to its enjoyment by the visiting public. The sea therefore acts as a background, and while being integral to the setting of the castle, is so by reference.

13.6.1.3.10 *North Berwick Law*

54. North Berwick Law represents a highly important Iron Age hilltop site, perched on top of a steep sided volcanic plug that rises sharply out of the surrounding flat topography, close to the south coast of the Forth at North Berwick. It commands extensive views across the surrounding landscape, as well as out to sea towards the Offshore Wind Farm. The summit contains the scanty remains of a dry stone walled fort, the enclosed area being of roughly 160 m x 100 m, with further areas enclosed by two more outer walls. The potential remains of roundhouses or similar structures can be discerned from the undulating ground surface. The unrestricted views are an important part of the setting of the monument, allowing the prehistoric occupants and visitors long distance unencumbered views (Figure 13.13 (Volume 2)).

13.6.1.3.11 *Doon Hill forts*

55. The Iron Age hill forts at Doon Hill, similarly to North Berwick Law, occupy a high point in the landscape, allowing the prehistoric occupants to see a long distance. Both forts are triangular in plan, but have been badly damaged over time by ploughing so that they are only visible on aerial photographs. One once measured 130 m by 80 m and had an inner and outer rampart. The setting of the forts on a high point in the landscape is one of high visibility, both in terms of being viewed from elsewhere and the view from the fort. The view out to sea was, however, probably less important than that of the surrounding landscape, and is therefore not considered integral to the overall understanding or appreciation of the forts (Figure 13.4 (Volume 2)).

13.6.1.3.12 *St Andrews Harbour*

56. The harbour at St Andrews, a Category A-Listed Structure, is built on the small estuary of the Kinness Burn, downhill from the cathedral and priory. The earliest sections of the current harbour walls dates to the late 18th or 19th century, with some sections being later in the 19th century and 20th century, although a harbour has been present on the site since the 13th century. The current harbour is made of stone, with the outer wall being built of vertically set stones for 230 m out from the land, before becoming horizontal set stones. Several sections have been heavily and crudely buttressed with concrete during the second half of the 20th century. The harbour has views out into the Tay Estuary and across the North Sea (Figure 13.15 (Volume 2)) which are integral to the setting of the harbour.

13.6.1.3.13 *Bell Rock Lighthouse*

57. The Bell Rock lighthouse, a Category A listed building, was built between 1807 and 1811 by Robert Stephenson. It is a curved 36 m tall tapering masonry tower with base courses set into rock, and is the first lighthouse ever constructed on a half-tide rock. Although the internal fittings of the lighthouse have all been replaced, there have been only minor alterations to the exterior since the lighthouse was built. These include minor external additions and renewal of the lantern and gallery. The lighthouse was de-manned in 1988 and is now fully automated.
58. The current setting of the lighthouse is a solitary setting, exposed on a tide washed rock 18 miles out to sea. The wide 360° views across the sea are part of the setting, but as it sits in a busy and important seaway, they are rarely completely empty. The key view is onshore directly towards to the Arbroath signal tower at Arbroath, which used to send and receive messages from the Lighthouse when both were manned. It is also worth noting that the lighthouse is not accessible to the public and therefore the ability to appreciate the 360° views from the top of the lighthouse is not possible. It was not possible to complete site visits of Bell Rock Lighthouse.

13.6.1.3.14 *Arbroath Signal Tower*

59. The Bell Rock Lighthouse signal tower is a castellated group of twin lodges and Signal Tower in a classical style, built in 1813. The structure now functions as a museum and houses exhibitions on the lives of the fishermen of the area, 'Arbroath Smokies' and the story of the building of the lighthouse including historical artefacts from the lighthouse itself. The buildings were constructed to serve as the shore station of the Bell Rock lighthouse and housed its keepers and their families until 1955. The signal tower itself was built to facilitate signalling between the lighthouse and the shore. This was undertaken by a variety of means and at times involved the use of telescopes, flags, pigeons and a large copper signal-ball. The building complex has been kept in a condition very similar to its original design, however the Tower itself is not accessible to visitors.
60. The important part of the setting for this building in terms of its working heritage is the key view of the Bell Rock lighthouse out to sea, which the signal tower would need to see clearly to communicate with it, which as Figure 13.16 (Volume 2) shows is not affected by the Wind Farm, which lies off to the south on the horizon, a large gap of open sea between it and the Bell Rock. The setting of the tower within Arbroath is coastal, and set slightly aside from the town buildings, split off by the main road and an open area of grass (Figure 13.17 (Volume 2)).

13.6.1.3.15 *Dunbar Battery*

61. Dunbar Battery is located on Lamer Island and is connected to the mainland by a causeway which forms part of Dunbar Harbour. It was built in 1781 to protect Dunbar from privateers and foreign raiders. Originally holding 16 guns of various calibres, following the end of the Peninsula War these were removed to Edinburgh Castle and the fort fell into disuse. During the World War (WWI), a small hospital was built within the battery, going out of use after the war. Excavations and historic building recording by AOC Archaeology during the 2010s (Marot pers. comm.) have fully exposed

the floor plan of the battery, which has been fully conserved. The site has views out over the mouth of the Forth which are integral to its function as a defensive battery (Figure 13.18 (Volume 2)).

13.6.1.3.16 *St Andrews Links*

62. The historic part of the Links, a series of golf courses to the northwest of St Andrews are made up of six individual courses: the Old Course, the New Course, the Jubilee Course, the Eden Course, the Strathtryum Course and the Balgrove Course. It is recorded as an inventoried Historic Garden and Designed Landscape (HGDL) and renowned internationally as 'The Home of Golf'. These courses and their associated infrastructure of benches, outbuildings and paths are set on a headland at the mouth of the River Eden, with open sea to the east, the river estuary to the north and west and the coastal plain of north Fife to the south (Figure 13.19 (Volume 2)). The views out to sea are not integral to the function or setting of the Links.

13.6.1.3.17 *Cambo Estate Designed Landscape*

63. The Inventory HGDL at Cambo dates to the 18th and 19th centuries, including Cambo House and its associated gardens, woodland walk areas, the estate farm and the Kingsbarns golf course. Of these, the House and gardens are very enclosed, while the farmland and golf course, which is along the coastline, are more open, with wide views out to sea.
64. It is clear that the design of the grounds at Cambo House were intended to be inward referencing, with the viewer being enclosed by trees and structures and no obvious view of the coastline. The golf course and farmland make more reference to the sea, although this view does not seem to be integral to the designation (Figure 13.20 (Volume 2)).

13.6.2 Development of Baseline Conditions without the Project

65. Generally, without the Project, natural processes will continue to affect the cultural heritage baseline influenced by local environmental conditions and climate change, which may preserve or deteriorate their condition, above and below the ground. Natural processes may be of longer duration and occurring over longer timescales.

13.7 Design Envelope – Worst Case Design Scenario

66. The Project will comprise the construction, operation and decommissioning of an offshore wind farm with a capacity of up to 450 MW, comprising of up to 54 turbines. The assessment scenarios identified in respect of the setting of archaeology and cultural heritage have been selected as those having the potential to represent the greatest effect on an identified receptor based on the design envelope described in Chapter 4: Project Description. Appendix 14.1: SLVIA Technical Report presents a design analysis to ensure that the indicative layout presented in Chapter 4: Project Description represents the worst case design scenario in visual terms. The worst-case design scenarios are set out in Table 13.8.

Table 13.8: Design envelope scenario assessed

Potential Impact	Worst Case Design Scenario	Justification
Operation		
Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Number of structures = 54 wind turbines on 6-legged jacket structures plus Met Mast, 2 OSPs on 8-legged jacket structures. Maximum rotor tip height of 208m. Maximum rotor diameter of 167m. Maximum hub height of 126m. Minimum turbine spacing of 800m. Turbines and rotors to be painted Light Grey RAL 7035	Largest ZTV from largest size and number of turbines.
Cumulative Effects		
Cumulative effect with other nearby offshore wind farms on the setting of onshore receptors	Consented design specifications (2014: Inch Cape Offshore Wind Farm (up to 110 turbines, with blade tip height at 215 m), Seagreen Alpha and Seagreen Bravo Offshore Wind Farms (150 turbines with blade tip height around 210 m). Planned updated design specifications (2017): Inch Cape Offshore Wind Farm (up to 72 turbines, with blade tip height up to 301m) and Seagreen Phase 1 Offshore Wind Farm (up to 120 turbines with blade tip height up to 280 m). N.B. The blade tip height for Inch Cape Offshore Wind Farm has been reduced to 291m, slightly lower (10 m) than the worst-case considered here and depicted in the subsequent illustrations.	These two offshore wind farms are located within the Forth/Tay estuaries and have the potential to have a cumulative impact on the setting of onshore receptors

13.7.1 Embedded Mitigation

67. A range of Embedded Mitigation measures to minimise the potential effects on cultural heritage and marine archaeology are captured within the Project design envelope. The scoping of the assessment of effects on cultural heritage and marine archaeology, together with the assessment of settings, has taken account of the following Embedded Mitigation measures:

- Analysis of pre-construction survey data will be undertaken to refine the identified potential marine archaeology assets at infrastructure locations. Appropriate micro-siting allowance for identified assets will be agreed in consultation with HES;
- Both the micro-siting allowance and exclusion zones will be detailed in the WSI described above. This will reduce any potential impacts on marine archaeology;
- Mitigation relating to effects of the Offshore Wind Farm on the setting of cultural heritage receptors will include:
- Turbines will all be of similar dimensions for hub height and blade tip level subject to turbine and substructure design and installation specification;
- The Turbines will all be pale grey in colour (Light Grey RAL 7035) with a semi-matt finish. This tends to reduce the distance over which the turbines are visible, especially in dull or overcast conditions, which often occur. As offshore turbines are often viewed against the sky, pale grey is the most appropriate colour as it is closest to that of the lower part of the sky under the most frequent UK weather conditions;
- In order to consider the aesthetic aspects of wind farm design, an analysis was undertaken of alternative layouts to inform Chapter 14: SLVIA. The Design Analysis is presented in Annex 1 of Appendix 14.1. The design analysis provides 'design objectives' that can be used to refine the appearance of the final wind farm layout. Detailed siting of the offshore turbines will also be driven by a range of physical and environmental

constraints including localised geological conditions, ecology, aviation, navigation, wind resource and marine archaeology.

13.7.2 Anticipated Consent Conditions Commitments

68. A number of consent conditions were attached to The Consents to manage the environmental risk associated with the Originally Consented Project. NnGOWL anticipate that any future consents issued to the Project may incorporate similar conditions to manage the risk to marine archaeology or cultural heritage assets commensurate with the Project design envelope where it remains necessary to do so. Table 13.9 sets out the conditions attached to The Consents which have some relevance to the management of effects on marine archaeology and cultural heritage.

Table 13.9: Consent conditions for the Originally Consented Project relevant to maritime archaeology and cultural heritage

Original Consent Requirement	Relevance to marine archaeology and cultural heritage
Environmental Management Plan	Setting out, for approval, an EMP detailing a WSI to be followed in the event of an archaeological discovery.
Marine Archaeology Reporting Protocol	Setting out, for approval, procedures to follow on discovery any marine archaeology during the construction, operation, maintenance and monitoring of the Project.

13.8 Impact Assessment

13.8.1 Construction Phase Impacts

69. The impacts resulting from the construction of the Project have been assessed on the setting of archaeology and cultural heritage receptors identified within the study area. It has been concluded that there will be no construction phase impacts on the setting of the receptors identified in Section 13.7.

13.8.2 Operational Phase Impacts

70. The impacts resulting from the operation of the Project have been assessed on the setting of archaeology and cultural heritage receptors identified within the study area. A discussion of the likely significance of each effect resulting from each impact is presented below.

13.8.2.1 Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors

13.8.2.1.1 Tentsmuir Coastal Defences

71. The open coastal setting of the coastal defences, considered a receptor of high sensitivity due to their scheduled monument status, will look out on to the Project, which will be 32 km offshore. The turbines will only visible as very small features on the horizon from the features within the scheduled area along the east coastal strip, not from the southern bank of the Tay Estuary or from the inland woodland areas. The pillboxes are on the edge of the forest, looking out to sea across dune fields and a wide sandy beach, with the beach and intertidal area being their key view as defensive structures against seaborne invasions. The stark openness of the environment and the wide, open views across the sea form a less important part of the setting of these receptors. During the site visit the weather conditions and visibility were poor, however the photomontage from LUC, alongside the wireline model from Tentsmuir gives a good indication of the impact of the Offshore Wind Farm on the setting (Figure 13.14 (Volume 2)). At this distance, the turbines will not compromise the views over the beaches and intertidal zones or the open sea view of the receptors, visible only as small thin vertical features on the horizon, and visitors will still be able to appreciate

their setting as defensive installations and observation posts. The magnitude of the effect on the setting of the receptor is therefore judged to be negligible as shown in Table 13.10.

Table 13.10: Impacts on Tentsmuir coastal defences

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Tentsmuir coastal defences	Negligible	High	Minor

13.8.2.1.2 Crail Airfield

72. Crail Airfield, a scheduled monument and therefore of high sensitivity, situated on the coastal plain north of Crail, is 16 km west of the Project and will have intervisibility with all of the turbines, which will be visible as small thin vertical features on the horizon to the east. As noted before, the setting of the airfield is down to the flat nature of the topography in the area, along with its proximity to the Royal Navy base at Rosyth in the Forth. The hangers, runways and control tower all have a setting based on intervisibility between them, particularly the control tower which required full visibility of the runways and much of the airfield. The Project will not impact on this intervisibility within the airfield and, as the destination for the aircraft stationed there was the inner Forth off to the southwest, the Project will not affect the wider setting for the airfield (Figure 13.15 (Volume 2)). The magnitude of effect of the Project on Crail Airfield is judged to be negligible as shown in Table 13.11.

Table 13.11: Impacts on Crail Airfield

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Crail Airfield	Negligible	High	Minor

13.8.2.1.3 Crail Airfield Pillbox

73. The setting of the pillbox on Foreland Head is entirely based on its view across the foreshore, as a beach defence installation, rather than out to sea (Figure 13.16 (Volume 2)). The whole Offshore Wind Farm will be visible from the pillbox, which is 15.5 km from it, as thin vertical features on the horizon. The overall understanding and appreciation of the pillbox, a particularly well-preserved example that remains in its original position, will not be affected as it will remain clear that it was placed there to protect the coastline from invasion and to defend against enemy landings, reflected in the judgement that the receptor’s sensitivity is medium in this case. During the site visit, the weather conditions were clear and the Bell Rock Lighthouse, a similar distance away as the Wind Farm Area, was only just visible on the horizon. It is therefore judged that the magnitude of effect on the setting of the pillbox will be low as shown in Figure 13.6 (Volume 2), with it retaining much of the significance of a defensive position on the shore.

Table 13.12: Impacts on Crail Airfield Pillbox

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Crail Airfield Pillbox	Low	Medium	Minor

13.8.2.1.4 St Andrews Castle

74. St Andrews Castle, a scheduled monument and therefore considered of high sensitivity, lies 29 km to the northwest of the Wind Farm Area, with a commanding position on the cliffs overlooking the sea. The sensitivity of the receptor has been assigned as high. The turbines will be visible on a clear day as small thin vertical features on the horizon, with roughly half of the turbines visible extending out north from behind the Fife coast as it turns south at Foreland Head. The turbines will take up less than 1% of the vertical field of views. During the site visit, the weather conditions and visibility were poor, with partially restricted views due to rain; however the photomontage provided by the SLVIA consultants provides a good demonstration of the view. The important views from the castle (along the coast and out to sea- Figure 13.7 (Volume 2)) are not compromised by the turbines in the extreme distance, nor is the appreciation of the castle from the town itself. The magnitude of the effect on the receptor is therefore judged to be negligible as shown in Table 13.13.

Table 13.13: Impacts on St Andrews Castle

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Castle	Negligible	High	Minor

13.8.2.1.5 St Andrews Cathedral

75. The Cathedral in St Andrews, a scheduled monument and therefore considered of high sensitivity, has commanding views across the area to the east of the town and the sea to the northeast from the Cathedral Tower, although these views are fully restricted by the boundary walls at ground level. St Rules Tower is accessible to visitors however and so the turbines will be visible from the top (Figure 13.8 (Volume 2)) as small thin vertical features on the far horizon, extending out north from behind the Fife coast as it turns southward at Foreland Head. These will only be visible on days when conditions are clear, as it was on the site visit. While they will be modern features within the wider landscape, their distance to the receptor means that they do not impinge on the near distance or medium distance views from the Cathedral tower nor do they distract from the impressive setting of the Cathedral within St Andrews. The magnitude of the effect on this receptor is therefore judged to be negligible as shown in Table 13.14.

Table 13.14: Impacts on St Andrews Cathedral

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Cathedral	Negligible	High	Minor

13.8.2.1.6 Isle of May Old Lighthouse

76. The old lighthouse or beacon on the Isle of May sits on the highest point on the island, and though much reduced in height from its period of use (it is now roughly 7.3 m high when it was originally around 12.5 m high), remains an impressive monument, considered of high sensitivity. Its setting during its working lifetime was as a beacon standing as the highest point on the island, visible to shipping within the mouth of the Firth of Forth. This has already been compromised by the 19th century lighthouse which stands to the west, taller than the current remains of the beacon. It has further been compromised by two small brick buildings and a helipad down slope to the east which detract from the isolation of the original monument (Figure 13.9 (Volume 2)). The whole of the Offshore Wind Farm will be visible from the beacon on clear days 16 km to the east as thin vertical features on the horizon. This receptor is highly sensitive to the impact associated with the presence of the turbines on the horizon. Similarly, as with the priory buildings (see Section 13.8.2.1.7), the main significance of the current setting of the Beacon is its local setting on the island and the visibility of it from the sea nearby. It is currently not accessible to visitors as no paths leads directly to it and visitors to the island are asked to keep to designated paths to avoid disturbing the seabird colonies. The main view point of the beacon is from an information board in a small valley to the west of it, with visitors looking up to the structure. From this point, the Offshore Wind Farm is entirely hidden (Figure 13.9 (Volume 2)). It is therefore judged that the magnitude of the effect on the setting is negligible as shown in Table 13.15.

Table 13.15: Impacts on Isle of May Old Lighthouse

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Isle of May Old Lighthouse	Negligible	High	Minor

13.8.2.1.7 Isle of May Priory

77. The extant and excavated remains of the 13th century priory on the Isle of May have a setting based on isolation, but also of visibility from passing shipping, in common with many of the island and coastal monasteries of the east coast e.g. Lindisfarne. The priory sits nestled in a sheltered spot below two small hills to the west overlooking the small sandy landing place on the southeast of the island (Figure 13.10 (Volume 2)) and is a scheduled monument, considered of high sensitivity. Its setting is therefore firstly clearly referencing the landing place, and the visibility of any shipping coming from the south and east towards the island (Figure 13.10 (Volume 2)). This has been

slightly compromised by the 19th century foghorn building to the south and the lighthouse to the northwest, although neither are close enough to the priory remains to affect their setting directly. This receptor is highly sensitive to the impact associated with the presence of the turbines on the horizon. The Offshore Wind Farm, which will be 16.5 km to the east will be visible from the priory on clear days, with the turbines being small thin vertical features on the horizon. While they will be directly in view of the remains, the distance from the receptor means that the impact will be muted, particularly as the key part of the setting of the priory is based on its immediate surroundings and its visibility from the sea, neither of which will be affected. The magnitude of effect is therefore judged to be negligible as shown in Table 13.16.

Table 13.16: Impacts on Isle of May Priory

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Isle of May Priory	Negligible	High	Minor

13.8.2.1.8 Dunbar Castle and Castle Park

78. The setting of Dunbar Castle, a scheduled monument and therefore considered of high sensitivity, 29.3 km from the Wind Farm Area, is based around its relationship with the town, towering over parts of it on the large rock outcrop. As much of the castle was damaged or destroyed by the cutting of the entrance to Victoria Harbour in the 19th century, the setting of the castle is already at least partially compromised. Therefore the sensitivity of the receptor is considered to be high. As the wireline model in Figure 13.11 (Volume 2) shows, the impact of the Offshore Wind Farm is minor, with the individual turbines visible on the horizon and only taking up less than 1 % of the vertical view. The magnitude of effect is therefore judged to be negligible on the setting of Dunbar Castle, as shown in Table 13.17.

Table 13.17: Impacts on Dunbar Castle and Castle Park

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Dunbar Castle and Castle Park	Negligible	High	Minor

13.8.2.1.9 Tantallon Castle

79. Tantallon Castle, a scheduled monument and therefore considered of high sensitivity, sitting high on a promontory 30.3 km from the Wind Farm Area, has a setting of isolation and exposure, which strongly references the sea. The individual turbines will be visible on the horizon behind the castle but only taking up 1% of the vertical view (Figure 13.12 (Volume 2)), with the Bass Rock remaining far more prominent in the view. The turbines are pinpricks on the horizon. The magnitude of effect

is therefore judged to be negligible on the overall setting of Tantallon Castle, as shown in Table 13.18.

Table 13.18: Impacts on Tantallon Castle

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Tantallon Castle	Negligible	High	Minor

13.8.2.1.10 North Berwick Law

80. The site at North Berwick Law, a scheduled monument and therefore considered of high sensitivity, 33.5 km from the Wind Farm Area has a setting which references the sea but is not integral to it, nonetheless the sensitivity of the receptor is considered to be high. The Offshore Wind Farm sits on the horizon, taking up less than 1% of the vertical view (Figure 13.13 (Volume 2)) and does not interfere with the views to the Bass Rock or Isle of May therefore the magnitude of the effect is considered to be negligible. The individual turbines will be visible but will not distract from the monument or its setting as a dominant feature of the local and regional landscape, making the magnitude of the effect negligible, therefore the significance of the impact is minor (Table 13.19).

Table 13.19: Impacts on North Berwick Law

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	North Berwick Law	Negligible	High	Minor

13.8.2.1.11 Doon Hill Fort

81. The setting of the fort at Doon Hill, a scheduled monument and therefore considered of high sensitivity, 37.1 km from the Wind Farm Area is mostly based on the prominence of the fort above the surrounding landscape, with only part of this being based on the views out to sea. The Offshore Wind Farm, as presented in the wireline model (Figure 13.14 (Volume 2)), is only visible as pinpricks on the horizon, taking up very little space in the overall view and not compromising the setting of the monument. This gives a negligible magnitude of effect with an impact of only minor significance to the monument, as shown in Table 13.20.

Table 13.20: Impacts on Doon Hill Fort

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Doon Hill Fort	Negligible	High	Minor

13.8.2.1.12 St Andrews Harbour

82. The harbour at St Andrews, a Scheduled Monument regarded as of high sensitivity, 29 km from the Project, has open views to the sea, clearly referencing the wider North Sea, although the view from within the harbour mouth is restricted to the north by the outer harbour wall (Figure 13.15 (Volume 2)). The setting of the harbour as a haven and place of safety from the sea remains, although the sites setting is also as a place to voyage out from into the North Sea and beyond (Figure 13.15 (Volume 2)). Around half of the Offshore Wind Farm will be visible from the harbour on clear days, with the rest hidden behind the Fife coastline. The turbines will only be visible as small thin vertical features on the horizon, and will not obscure the wide views of the sea from the outer harbour wall or compromise the setting of the harbour within the local landscape of St Andrews. The magnitude of effect on the setting is therefore judged to be negligible as shown in Table 13.21.

Table 13.21: Impacts on St Andrews Harbour

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Harbour	Negligible	High	Minor

13.8.2.1.13 Bell Rock Lighthouse

83. This receptor, a Scheduled Monument regarded as of high sensitivity is 12.6 km distant from the turbines, is the closest receptor to the Wind Farm Area and therefore has the greatest potential for an impact to occur on its setting. The key view from this receptor is focussed towards the Arbroath signal tower and this intervisibility would remain unaffected following the construction of the Project, which is further offshore. The distance of 12.6 km between the Lighthouse and Wind Farm Area means that the turbines do not compete with the lighthouse for size, and do not surround it either, as shown in Figure 13.16 (Volume 2). From the Angus coastline, the turbines will be visible on the horizon to the south of the lighthouse, while from the Fife coastline they will be visible to the east of the lighthouse, but again only on the horizon and as thin vertical features. The magnitude of effect is therefore judged to be negligible on the Bell Rock, as shown in Table 13.22.

Table 13.22: Impacts on Bell Rock Lighthouse

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Bell Rock Lighthouse	Negligible	High	Minor

13.8.2.1.14 *Arbroath Signal Tower*

84. The Wind Farm Area is over 30 km from the Arbroath Signal tower, a receptor considered of high sensitivity, meaning that the turbines would only be visible on clear days and then only as small thin vertical features on the horizon. The weather during the first site visit was poor, with very low visibility and the Bell Rock lighthouse was not visible, even from the top of the tower. A return visit was made during better visibility on 11/08/2017, with the Bell Rock lighthouse being just visible on the horizon. The photomontage of the view from the site to the Wind Farm Area shows the view on a clear day, and so both are presented to illustrate the variability of visibility from the signal tower out to sea (Figure 13.17 (Volume 2)). The tower is generally inaccessible to visitors and so this elevated view should not be taken as typical of a visitor experience. While the turbines add a modern element to the views out to sea, they do not block or interfere with the key view from the Signal tower: that of the Bell Rock Lighthouse. The turbines will take up less than 1 % of the vertical field of view and so the magnitude of the effect on the setting is judged to be negligible, as shown in Table 13.23.

Table 13.23: Impacts on Arbroath Signal Tower

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Arbroath Signal Tower	Negligible	High	Minor

13.8.2.1.15 *Dunbar Battery*

85. The Category B medium sensitivity receptor Dunbar Battery, 18.3 miles from the Wind Farm Area, commands extensive views out to sea which are integral to its setting as a defensive structure protecting Dunbar from raiders and seaborne invasions. The extent to which the Offshore Wind Farm detracts from this, as shown in the wireline model in Figure 13.18 (Volume 2), is negligible as the turbines are only visible as pinpricks on the horizon, taking up very little of the view, and allowing visitors to still experience the expansive views from the Battery out to sea. The impact is therefore negligible, as shown in Table 13.24.

Table 13.24: Impacts on Dunbar Battery

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Dunbar Battery	Negligible	Medium	Negligible

13.8.2.1.16 St Andrews Links

86. The Offshore Wind Farm will be visible on the horizon from much if not all of the HGDL area of St Andrews Links, considered a receptor of medium sensitivity, at a distance of 30 km to the southeast along the north Fife coast. The setting of the Links is generally internally referencing, with the important views being along the fairways from tees to greens, which generally run northwest-southeast or vice versa. The Offshore Wind Farm will be visible along the coast beyond Fife Ness but will not interrupt the key views along the fairways or beyond them, or the view of St Andrews itself from the Links, which is also a critical view (Figure 13.19 (Volume 2)). This distance will mean that the turbines will only be visible on clear days and only as small thin vertical features on the horizon, taking up less than 1% of the vertical field of view (weather and visibility conditions during the site visit were poor due to heavy rain and so the location of the turbines was not visible at the time, however the photomontage of the view from the site towards the Offshore Wind Farm does present a clear view of the area). While this is adding in a modern aspect to the overall setting of the Links, the turbines are at such a distance to the receptor, and the open vistas from the Links to the historic centre of St Andrews will be unaffected that the magnitude of the effect is judged to be negligible as shown in Table 13.25.

Table 13.25: Impacts on St Andrews Links HGDL

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Links	Negligible	Medium	Negligible

13.8.2.1.17 Cambo Estate Designed Landscape

87. The Cambo Estate Designed Landscape, a receptor of medium sensitivity is 18.2 km from the Wind Farm Area and, as noted before, is a restricted visibility landscape, deliberately closed off from the outside world by extensive woodlands, hiding the house and close gardens from public view (Figure 13.20 (Volume 2)). This also means that the house and gardens have restricted visibility with the Offshore Wind Farm and no turbines would be visible from them. The wider landscape including the farm buildings and golf course will have intervisibility with roughly half of the turbines, with the remainder hidden behind the coastline. The setting of these features will not be overly impacted, as the turbines will be only visible on clear days as small thin vertical features on the horizon, taking

up 1% of the vertical field of view. Also, it is judged that they will not adversely impact the setting of the farm buildings, which are nestled within agricultural fields (Figure 13.20 (Volume 2)) or the golf course for which the key views are up/down the fairways from tee to green and only obliquely references the sea. The magnitude of effect is therefore judged to be negligible as shown in Table 13.26.

Table 13.26: Impacts on Cambo Estate HGDL

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Turbines	Presence of Offshore Wind Farm, Met Mast and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Cambo Estate designed landscape	Negligible	Medium	Negligible

13.8.3 Decommissioning Phase Impacts

88. Impacts from decommissioning are anticipated to be similar to those during construction as infrastructure is removed from the seabed at the end of the Project's operational life. There would be no effects resulting from decommissioning activities on the setting of archaeology and cultural heritage receptors, as with the construction phase.
89. Although currently it is anticipated that all of the Project infrastructure, towards the end of the operational life of the Project, all decommissioning options will be considered. It may be deemed that removal of certain pieces of infrastructure may have a greater environmental impact than leaving in-situ; however, this is most likely to relate to certain aspects of the subsea infrastructure rather than the above-water structures which would be entirely removed such that any effects on setting would be entirely reversed. The potential decommissioning options will be presented to MS-LOT in a Decommissioning Programme for approval prior to construction. The Decommissioning Programme will then be reviewed and amended as required prior to the commencement of any decommissioning activities.

13.8.4 Cumulative Impacts

90. Cumulative effects refer to effects upon receptors arising from the Project when considered alongside other proposed developments and activities and any other reasonably foreseeable project proposals. In this context, the term 'projects' is considered to refer to any project with comparable effects and is not limited to offshore wind projects. The cumulative assessment focuses on the scope of this EIA, i.e. potential setting effects during the Operation phase on agreed receptors within the cumulative ZTV. Construction and Decommissioning phases are not considered, as setting effects are not considered to be induced during these phases.
91. Projects and activities considered within the cumulative impact assessment are set out in Table 13.27. There may be an element of uncertainty associated with the design envelope of proposed projects, therefore a judgement is made on the confidence associated with the latest available design envelope.
92. In assessing the cumulative impacts for the Project, two scenarios are considered to take into account the previously consented and currently proposed design envelopes of the Inch Cape Offshore Wind Farm and the Seagreen Phase 1 Wind Farm Project. Scenario one incorporates the design envelopes for the proposed Inch Cape and Seagreen projects as detailed in the Scoping Reports submitted to MS-LOT (ICOL, 2017; Seagreen, 2017) updated to take account of additional

project information provided by the developers. Scenario two incorporates the consented design envelopes as detailed in the respective project consents (ICOL, 2014; Seagreen, 2014a; Seagreen, 2014b) as presented in Table 13.27. While the Forthwind and Kincardine Offshore Wind Farms were considered for the cumulative assessment in the SLVIA chapter, the analysis conducted there is on a broad landscape basis rather than individual receptors and therefore requires a wider scope. These two wind farms are considered to be too distant from the receptors discussed to have any impact on their setting, and therefore will not be considered within this assessment.

Table 13.27: Projects for cumulative assessment

Development Type	Project	Status	Data Confidence Assessment / Phase
Offshore Wind Farm	Inch Cape Offshore Wind Farm	Consented	High – Consented project details available.
Offshore Wind Farm	Inch Cape Offshore Wind Farm	Proposed	High – project details in the Scoping Report and additional information provided by the Developer.
Offshore Wind Farm	Seagreen Alpha Offshore Wind Farm	Consented	High – Consented project details available.
Offshore Wind Farm	Seagreen Bravo Offshore Wind Farm	Consented	High – Consented project details available.
Offshore Wind Farm	Seagreen Phase 1 Offshore Wind Farm	Proposed	High - project details provided by Developer.

93. Table 13.28 sets out the potential cumulative impacts and the worst case cumulative design envelope scenario considered within the cumulative impact assessment. For individual cultural heritage receptors, it is considered that the size rather than the density of the turbines is the important factor in cumulative assessments, with four larger turbines being more obvious within the setting than 20 smaller ones, particularly at the distances from the Offshore Wind Farm that the receptors are. Therefore scenario one is considered the worst case scenario for potential impacts on cultural heritage receptor settings. Details of other wind farms are taken from their respective scoping reports, accessed via <http://www.gov.scot/Topics/marine/Licensing/marine/scoping>

Table 13.28: Cumulative worst-case design envelope scenarios.

Impact	Worst Case Design Scenario	Justification
Cumulative setting impacts for proposed projects in the vicinity	Both Inch Cape Offshore Wind Farm (up to 72 turbines, with blade tip height up to 301 m) and Seagreen Phase 1 Offshore Wind Farm (70-120 turbines with blade tip height up to 280 m) are built according to their current published worst case scenario designs	The Inch Cape and Seagreen Offshore Wind Farms will be behind or to one side of the Project when viewed from onshore receptors and so may have a cumulative impact on the setting of some or all of those receptors.

13.8.4.1 Cumulative Operation Phase Impacts: Setting of onshore receptors

13.8.4.1.1 Tentsmuir coastal defences

94. As the cumulative wireline model for Tentsmuir (Figure 13.4 (Volume 2)) shows the turbines of Seagreen Phase 1 are almost totally invisible from this distance. The revised Inch Cape turbines are clustered in approximately 20 horizontal degrees of the view on the horizon, a similar size to those of the Project. They are separate to the Project turbines by roughly 30 horizontal degrees, which take up a further 20 degrees of the horizon. Both Offshore Wind Farms take up less than 1% of the vertical view, and so the magnitude of effect is judged to be negligible, as both are only just visible

on the horizon and do not form a single wide block taking up large proportions of the key views from the coastal defences, as shown in Table 13.29.

Table 13.29: Impacts on Tentsmuir coastal defences

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Tentsmuir coastal defences	Negligible	High	Minor

13.8.4.1.2 Crail Airfield

95. The cumulative wireline drawing (Figure 13.5 (Volume 2)) shows that only the Project turbines will be visible from Crail Airfield, with the other Offshore Wind Farms hidden behind Fife Ness with only the upper blade tip of each turbine visible above the land. The cumulative impact of the Projects on Crail Airfield is therefore judged to have a negligible magnitude of effect, as shown in Table 13.30.

Table 13.30: Impacts on Crail Airfield

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Crail Airfield	Negligible	High	Minor

13.8.4.1.3 Crail Airfield Pillbox

96. The cumulative wireline model for Fife Ness, close to the Crail airfield pillbox (Figure 13.6 (Volume 2)) shows the turbines of Seagreen Phase 1 Offshore Wind Farm are almost totally invisible from at this distance, and are generally obscured by the turbines of Inch Cape Offshore Wind Farm. The Offshore Wind Farm is the most prominent development, taking up approximately 35 horizontal degrees of the horizon, with a gap of 15 degrees between it and the more distant Inch Cape Offshore Wind Farm to the north, which takes up 30 degrees of the horizon. The Inch Cape turbines are only visible on the horizon and are much smaller than the turbines, however both still take up less than 2% of the vertical view, and as noted above the key view for the pillbox is across the beach, not the long distance views out to sea. The turbines leave enough gaps and open sea for the effect to be considered low, as shown in Table 13.31, with it retaining much of the significance of a defensive position on the shore.

Table 13.31: Impacts on Crail Airfield Pillbox

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Crail Airfield Pillbox	Low	Medium	Minor

13.8.4.1.4 St Andrews Castle

97. The view from St Andrews East Scores, applicable for the castle, cathedral and harbour, shows that the turbines of Seagreen Phase 1 are almost invisible and almost totally obscured by the slightly closer turbines of Inch Cape Offshore Wind Farm. These take up 30 degrees of the horizon, with a gap to the Offshore Wind Farm, which takes up 20 degrees of the horizon before being partially obscured by the north Fife coastline (Figure 13.7 (Volume 2)). The turbines of these two Offshore Wind Farms are roughly the same size, take up less than 1% of the vertical view directly on the horizon and do not obscure any part of the important or intrinsic views from the receptor. The magnitude of the effect on the receptor is therefore judged to be negligible as shown in Table 13.32.

Table 13.32: Impacts on St Andrews Castle

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Castle	Negligible	High	Minor

13.8.4.1.5 St Andrews Cathedral

98. The view from St Andrews East Scores, applicable for the castle, cathedral and harbour, shows that the turbines of Seagreen Phase 1 are almost invisible and almost totally obscured by the slightly closer turbines of Inch Cape Offshore Wind Farm. These take up 30 degrees of the horizon, with a gap to the Offshore Wind Farm, which takes up 20 degrees of the horizon before being partially obscured by the north Fife coastline (Figure 13.8 (Volume 2)). The turbines of these two Offshore Wind Farms are roughly the same size, take up less than 1% of the vertical view directly on the horizon and do not obscure any part of the important or intrinsic views from the receptor. The magnitude of the effect on this receptor is therefore judged to be negligible as shown in Table 13.33.

Table 13.33: Impacts on St Andrews Cathedral

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Cathedral	Negligible	High	Minor

13.8.4.1.6 Isle of May Old Lighthouse

99. The receptors on the Isle of May are the closest to the Neart na Gaoithe Offshore Wind Farm, and as the wireline model for the Isle shows (Figure 13.9 (Volume 2)), the Neart na Gaoithe turbines are the most obvious within the view, taking up approximately 40 degrees of the horizon and 2% of the vertical view. The turbines of Inch Cape Offshore Wind Farm take up an additional 25 degrees of the horizon, appearing directly to the north of the edge of the Neart na Gaoithe Offshore Wind Farm, but also obscuring the turbines of Seagreen Phase 1 Offshore Wind Farm, which are almost invisible on the horizon. It should be noted that the Inch Cape turbines appear considerably smaller than the Neart na Gaoithe turbines from the Lighthouse on the Isle of May, and as noted in Section 13.6.1.3.6, the setting of the lighthouse has been at least partially compromised by the later lighthouse to the west, and by the lack of visibility of much of the horizon from the only viewpoint for the old lighthouse. Therefore, for visitors viewing the lighthouse, very few of the turbines will be visible to those appreciating the setting of the lighthouse. It is therefore judged to comprise a negligible magnitude effect on the receptors setting, as shown in Table 13.34.

Table 13.34: Impacts on Isle of May Old Lighthouse

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Isle of May Old Lighthouse	Negligible	High	Minor

13.8.4.1.7 Isle of May Priory

100. The receptors on the Isle of May are the closest to the Neart na Gaoithe Offshore Wind Farm, and as the wireline model for the Isle shows (Figure 13.10 (Volume 2)), the Neart na Gaoithe turbines are the most obvious within the view, taking up approximately 40 degrees of the horizon and 2% of the vertical view. The turbines of Inch Cape Offshore Wind Farm take up an additional 25 degrees of the horizon, appearing directly to the north of the edge of the Neart na Gaoithe Offshore Wind Farm, but also obscuring the turbines of Seagreen Phase 1 Offshore Wind Farm, which are almost invisible on the horizon. It should be noted that the Inch Cape turbines appear considerably smaller than the Neart na Gaoithe turbines from the Lighthouse on the Isle of May, and as noted in Section 13.6.1.3.6, the setting of the priory has been at least partially compromised by the later lighthouse to the north and the Victorian foghorn building to the southwest. Equally the key view of the setting of the priory is looking west from the sea towards the priory, and this view is not impacted by any of the projects within the cumulative assessment. Nevertheless, the cumulative wireline

shows an uninterrupted development of turbines on the horizon for 65 degrees of the horizon which will be visible to visitors to the priory and therefore contributes to a low level negative effect on the setting of the priory; the magnitude of effect is therefore judged to be low as shown in Table 13.35.

Table 13.35: Impacts on Isle of May Priory

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Isle of May Priory	Low	High	Moderate

13.8.4.1.8 Dunbar Castle and Castle Park

101. The cumulative wireline for the three Offshore Wind Farm developments as seen from Dunbar (Figure 13.11 (Volume 2)) shows that only the Neart na Gaoithe Offshore Wind Farm turbines are visible, with the Inch Cape Offshore Wind Farm and Seagreen Phase 1 Offshore Wind Farm turbines almost totally obscured by the larger nearer turbines of Neart na Gaoithe. The cumulative setting impact is therefore the same as that described in Section 13.6.1.3.8, on the setting of Dunbar Castle, as shown in Table 13.36.

Table 13.36: Impacts on Dunbar Castle and Castle Park

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Dunbar Castle and Castle Park	Negligible	High	Minor

13.8.4.1.9 Tantallon Castle

102. The cumulative wireline model for Tantallon Castle shows that the Neart na Gaoithe Offshore Wind Farm turbines are the most prominent, taking up approximately 20 degrees of the horizon but still only taking up 1% of the vertical view (Figure 13.12 (Volume 2)), with the Bass Rock remaining far more prominent in the view. The turbines of Inch Cape and Seagreen Phase 1 are pinpricks on the horizon. It is therefore considered that the cumulative effect of the three Offshore Wind Farms will have a negligible magnitude of effect on the overall setting of Tantallon Castle, as shown in Table 13.37.

Table 13.37: Impacts on Tantallon Castle

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Tantallon Castle	Negligible	High	Minor

13.8.4.1.10 North Berwick Law

103. The turbines of Neart na Gaoithe, Inch Cape and Seagreen Phase 1 Offshore Wind Farms form a block covering 35 degrees of the horizon when viewed in the wireline model from North Berwick Law (Figure 13.13 (Volume 2)) but all the turbines are restricted to taking up less than 1% of the vertical view and do not obscure or interrupt the views to the Bass Rock or Isle of May. They are relegated to the horizon, and do not block any of the key views from the receptor, with the turbines of Neart na Gaoithe at least partially obscuring those of the more distant Offshore Wind Farms. The individual turbines will be visible but will not distract from the monument or its setting as a dominant feature of the local and regional landscape, as shown in Table 13.38.

Table 13.38: Impacts on North Berwick Law

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	North Berwick Law	Negligible	High	Minor

13.8.4.1.11 Doon Hill Forts

104. As the cumulative model shows, these sites are on a similar alignment to the Offshore Wind Farms to the receptors at Dunbar, although slightly further away. The Neart na Gaoithe Offshore Wind Farm turbines are barely visible, with the Inch Cape Offshore Wind Farm and Seagreen Phase 1 Offshore Wind Farm turbines almost totally obscured by the larger nearer turbines of Neart na Gaoithe, which are shown in the individual wireline model in Figure 13.14 (Volume 2). The Neart na Gaoithe Offshore Wind Farm turbines visible as pinpricks on the horizon, taking up very little space in the overall view and not compromising the setting of the monument. This gives a negligible magnitude of effect with an impact of minor significance to the monument, as shown in Table 13.39.

Table 13.39: Impacts on Doon Hill Fort

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Doon Hill Fort	Negligible	High	Minor

13.8.4.1.12 *St Andrews Harbour*

105. The view from St Andrews East Scores, applicable for the castle, cathedral and harbour, shows that the turbines of Seagreen Phase 1 are almost invisible and almost totally obscured by the slightly closer turbines of Inch Cape Offshore Wind Farm. These take up 30 degrees of the horizon, with a gap to the Neart na Gaoithe Offshore Wind Farm, which takes up 20 degrees of the horizon before being partially obscured by the north Fife coastline (Figure 13.15 (Volume 2)). The turbines of these two Offshore Wind Farms are roughly the same size, take up less than 1% of the vertical view directly on the horizon and do not obscure any part of the important or intrinsic views from the receptor. The magnitude of the effect on this receptor is therefore judged to be negligible as shown in Table 13.40.

Table 13.40: Impacts on St Andrews Harbour

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Harbour	Negligible	High	Minor

13.8.4.1.13 *Bell Rock Lighthouse*

106. As the cumulative wireline for the Bell Rock lighthouse demonstrates (Figure 13.16 (Volume 2)), the turbines from Inch Cape Offshore Wind Farm, Seagreen Phase 1 Offshore Wind Farm and Neart na Gaoithe Offshore Wind Farm are all further out to sea than the lighthouse. It is considered that the most important of these views being that from the lighthouse towards the Arbroath signal tower which had a known connection with the lighthouse. The cumulative impact will therefore be discussed in Section 13.8.4.1.14 below.

13.8.4.1.14 *Arbroath Signal Tower*

107. The Neart na Gaoithe Offshore Wind Farm is over 30 km from the Arbroath signal tower, meaning that the turbines would only be visible on clear days and then only as small thin vertical features on the horizon. Far more prominent is the Inch Cape Offshore Wind Farm which partly obscures the Seagreen Phase 1 Offshore Wind Farm behind it (Figure 13.17 (Volume 2)). The overall effect does add a large amount of additional structures into the seascape, but does not obscure the intervisibility between the lighthouse and the Arbroath signal tower, which remains the key view.

The cumulative assessment is therefore considered to have a negligible magnitude of effect from a cultural heritage stance, as shown in Table 13.41.

Table 13.41: Impacts on Arbroath Signal Tower

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Arbroath Signal Tower	Negligible	High	Minor

13.8.4.1.15 *Dunbar Battery*

108. The cumulative wireline for the three Offshore Wind Farm developments as seen from Dunbar (Figure 13.18 (Volume 2)) shows that only the Neart na Gaoithe Offshore Wind Farm turbines are visible, with the Inch Cape Offshore Wind Farm and Seagreen Phase 1 Offshore Wind Farm turbines almost totally obscured by the larger nearer turbines of Neart na Gaoithe Offshore Wind Farm. The cumulative setting impact is therefore the same as that described in Section 13.6.1.3.8, which gives a negligible magnitude of effect on the setting of Dunbar Castle, as shown in Table 13.42.

Table 13.42: Impacts on Dunbar Battery

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Dunbar Battery	Negligible	Medium	Negligible

13.8.4.1.16 *St Andrews Links*

109. The cumulative wireline model for St Andrews West Sands Road (directly to the east of the Links) shows that the turbines of Seagreen Phase 1 Offshore Wind Farm are totally invisible, while the turbines of Inch Cape Offshore Wind Farm appear very small, covering 30 degrees of the horizon and only 0.5% of the vertical view. The turbines of Neart na Gaoithe Offshore Wind Farm similarly are only visible on the horizon, split from the Inch Cape turbines by 20 degrees of open horizon and partially obscured by the north coast of Fife (Figure 13.19 (Volume 2)). The cumulative developments will not affect the key views and open vistas from the Links to the historic centre of St Andrews will be unaffected such that the magnitude of the effect is judged to have a negligible magnitude of effect as shown in Table 13.43.

Table 13.43: Impacts on St Andrews Links HGDL

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	St Andrews Links	Negligible	Medium	Negligible

13.8.4.1.17 *Cambo Estate Designed Landscape*

110. As noted in Section 13.6.1.3.17 there is no intervisibility between Cambo and the Neart na Gaoithe Offshore Wind Farm and therefore there is no requirement for cumulative analysis. The magnitude of effect is therefore judged to be negligible as shown in Table 13.44.

Table 13.44: Impacts on Cambo Estate HGDL

Source of impact	Pathway	Receptor	Magnitude of effect	Sensitivity of receptor	Significance of impact
Cumulative Offshore Wind Farm turbines	Presence of Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors	Cambo Estate designed landscape	Negligible	Medium	Negligible

13.8.5 Inter-relationships

111. No inter-related accumulations of impacts or effects have been identified for archaeology and cultural heritage that have not already been mitigated against through the embedded mitigation from the Original ES.

13.9 Mitigation and Monitoring

112. The assessment of impacts, both in isolation and cumulatively, on archaeology and cultural heritage receptors as a result of the construction, operation and decommissioning of the Project are predicted to be of generally minor or negligible adverse significance, with only one prediction of moderate adverse significance on one receptor. As set out in Section 14.7.1 of the SLVIA chapter, mitigation of landscape and visual effects relies on post-consent design processes that may help to reduce the levels of the identified effects, and it is at this point that mitigation to reduce the impact should occur.

13.9.1 Monitoring

113. As set out in the embedded mitigation, the monitoring and enforcing of AEZs around archaeology and cultural heritage receptors will be an important part of the mitigation strategy for all phases of construction, operation and decommissioning of the Project.

13.10 Summary of Residual Effects

114. This chapter has assessed the potential effects on the setting of archaeology and cultural heritage of the construction, operation and decommissioning of the Project, both in isolation and cumulatively. Table 13.45 summarises the impact determinations discussed in this chapter and presents the post-mitigation residual significance.

Table 13.45: Summary of predicted impacts of the Project

Potential Impact	Significance of Effect	Mitigation Measures	Residual Significance of Effect
Operation			
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Tentsmuir coastal defences	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Crail Airfield	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Crail Airfield pillbox	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: St Andrews Castle	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: St Andrews Cathedral	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Isle of May Old Lighthouse	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Isle of May Priory	Minor Significance	N/A	Minor Significance

Potential Impact	Significance of Effect	Mitigation Measures	Residual Significance of Effect
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Dunbar Castle	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Tantallon Castle	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: North Berwick Law	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Doon Hill Forts	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: St Andrews Harbour	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Bell Rock Lighthouse	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Arbroath Signal tower	Minor Significance	N/A	Minor Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Dunbar Battery	Negligible Significance	N/A	Negligible Significance
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: St Andrews Links	Negligible Significance	N/A	Negligible Significance

Potential Impact	Significance of Effect	Mitigation Measures	Residual Significance of Effect
Presence of Offshore Wind Farm, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology: Cambo Estate	Negligible Significance	N/A	Negligible Significance
Cumulative Effects			
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Tentsmuir coastal defences	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Crail Airfield	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Crail Airfield Pillbox	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: St Andrews Castle	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: St Andrews Cathedral	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Isle of May Old Lighthouse	Minor Significance	N/A	Minor Significance

Potential Impact	Significance of Effect	Mitigation Measures	Residual Significance of Effect
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Isle of May Priory	Moderate Significance	None proposed	Moderate Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Dunbar Castle	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Tantallon Castle	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: North Berwick Law	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Doon Hill Forts	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: St Andrews Harbour	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Bell Rock Lighthouse	Minor Significance	N/A	Minor Significance

Potential Impact	Significance of Effect	Mitigation Measures	Residual Significance of Effect
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Arbroath signal tower	Minor Significance	N/A	Minor Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Dunbar Battery	Negligible Significance	N/A	Negligible Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: St Andrews Links	Negligible Significance	N/A	Negligible Significance
Presence of Neart na Gaoithe, Inch Cape and Seagreen Offshore Wind Farms, Met Masts and OSP(s) on the setting of onshore cultural heritage and archaeology receptors: Cambo Estate	Negligible Significance	N/A	Negligible Significance

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