



# Chapter 14

## Seascape, Landscape and Visual

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# 14 Seascape, Landscape and Visual

## 14.1 Introduction

1. This chapter of the Environmental Impact Assessment (EIA) Report presents an assessment of the potential impacts arising from the construction, operation and decommissioning of the Project, as detailed in Chapter 4: Project Description, upon:
  - Seascape/landscape as a resource in its own right (caused by changes to its constituent elements, its specific aesthetic or perceptual qualities and/or its character); and
  - Views and visual amenity as experienced by people (caused by changes in the appearance of the landscape and seascape).
2. This chapter summarises the findings of the seascape, landscape and visual impact assessment (SLVIA), which is included in full in Appendix 14.1: SLVIA Technical Report. This chapter is comprised of the following elements:
  - A summary of relevant policy, guidance and legislation;
  - Details of the 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, including details of the study area and approach to the assessment of potential effects;
  - A review of the baseline conditions;
  - A description of the worst-case design scenario relevant to SLVIA;
  - 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.

## 14.2 Policy, Guidance and Legislation

3. There is no specific legislation relating to SLVIA.
4. Policy GEN7 of Scotland's National Marine Plan states: "*Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account.*" The plan notes the value placed on coastal landscapes, and refers to available guidance on good siting and design practice.
5. The methodology for this SLVIA has been developed primarily in accordance with the principles contained within the *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (GLVIA3) (LI and IEMA, 2013). Reference is made to other published guidance as appropriate, as listed below:
  - Scottish Natural Heritage (2017a) Siting and designing wind farms in the landscape. Version 3;
  - Scottish Natural Heritage (2017b) Visual Representation of Wind Farms: Good Practice Guidance. Version 2.2;
  - Scottish Natural Heritage (2012a) Offshore Renewables: Guidance on assessing the impact on coastal landscape and seascape;
  - Scottish Natural Heritage (2012b) Assessing the cumulative impact of onshore wind energy developments;

- Landscape Institute (2011) Photography and photomontage in landscape and visual impact assessment. Advice Note 01/2011; and
- Enviros (2005) Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report. Prepared for the Department of Trade and Industry (DTI).

### 14.3 Data Sources

6. The assessment considers the potential interaction between the Project, as described in Chapter 4: Project Description, and seascape / landscape and visual receptors within the study area.
7. The study area for the SLVIA has been defined as a radius of 50 kilometres (km) from the outer edge of the Wind Farm Area. For the purposes of cumulative assessment, a search area of 65 km radius has been adopted. These distances have been adopted on the advice of Scottish Natural Heritage (SNH), and agreed with SNH and local planning authorities (LPAs). The 50 km study area is illustrated in Illustration 14.1.
8. Baseline characterisation data has been collated from a combination of national and local sources, as well as project-specific information. details the data sources used to inform the baseline characterisation within the study area.

Table 14.1: Data sources used to inform the baseline description for SLVIA

Data Source	Study/Data Name	Overview
<b>Forth and Tay Offshore Wind Developers Group (FTOWDG)</b>	Regional Seascape Character Assessment: Aberdeen to Holy Island (2012) (Referenced in the Scoping Opinion as “baseline coastal character assessment”)	Criteria-based characterisation of the seascape along the east coast of Scotland and Northern England, and evaluation of sensitivity to offshore wind energy development. Undertaken as a joint baseline to inform SLVIA for all offshore wind farms proposed in the Forth and Tay area.
<b>SNH</b>	Landscape Character Assessments (1998-1999)	A series of reports giving description and classification of onshore landscape character, published as part of a nationwide programme in 1998-1999. Relevant reports cover South and Central Aberdeenshire, Tayside, Fife, the Lothians and the Scottish Borders.
<b>LPAs</b>	Development plans and background documents relating to landscape character and local landscape designations	Landscape character, capacity and local landscape designation studies produced by Aberdeenshire, Angus, Fife, East Lothian and Scottish Borders Councils.
<b>Historic Environment Scotland (HES)</b>	Inventory of Gardens and Designed Landscapes	Database of nationally important designed landscapes across Scotland, including their location, extent and qualifying interests.
<b>Met Office</b>	Atmospheric visibility data	Average visibility, recorded at Leuchars over a 10 year period from January 2007 to December 2016.
<b>Various</b>	Wind farms within the study area.	A list of operational, consented and proposed wind farms within the 65 km agreed cumulative study area, compiled from information provided by SNH, LPAs, and wind energy developers.

## 14.4 Relevant Consultations

9. As part of the EIA process, NnGOWL has undertaken a number of consultations with various statutory and non-statutory stakeholders. A formal scoping opinion was also requested from MS-LOT following submission of the Scoping Report. In response to NnGOWL’s request, MS-LOT issued a Scoping Opinion that indicated all aspects of SLVIA should be scoped in to the EIA process.
10. Ongoing consultation with relevant stakeholders continued post-scoping and responses have been used to develop an appropriate methodology and parameters for the SLVIA.
11. The recommendations made in the Scoping Opinion, and in subsequent correspondence, in respect of SLVIA are summarised in Table 14.2.

Table 14.2: Summary of consultation relating to SLVIA

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
<b>Scoping Opinion: Scottish Ministers responses to scoping questions</b>	Agree that 2012 baseline coastal character assessment can be used.	This is discussed at Section 14.6.1.1.
	Baseline information as described by Angus and East Lothian Councils should be used.	Landscape baseline information is discussed below and in Section 14.6.
	The assessment should be based on the maximum turbine height.	The SLVIA is based on the maximum turbine height of 208 m above LAT.
	No potential effects should be scoped out of the SLVIA.	Effects on onshore landscape character and Inventory Gardens and Designed Landscapes have been considered, see Sections 14.6.1.2 and 14.6.1.3.
	Provided a list of projects to be considered in the cumulative SLVIA.	These are included in the assessment, see Section 14.8.4.
	Advised NnGOWL to present approach to Offshore Wind Farm design, and provide comparison with the Originally Consented Project.	This material is presented in Annex 1 to Appendix 14.1.
	Accepted re-use of photography taken for the Original ES, but note photography should be retaken were stakeholders recommend.	This has been done, see detailed comments below.
	Effects of lighting should be considered, and advice of stakeholders should be considered in relation to location of night time visualisations.	This has been done, see detailed comments below.
	NnGOWL should consider the detailed advice provided by stakeholders in relation to viewpoint locations.	This has been done, see detailed comments below.
<b>Scoping Opinion: Scottish Natural Heritage</b>	Concerns that increased height may increase visual complexity, drawing attention to wind farm design.	Annex 1 to Appendix 14.1 provides further information in relation to wind farm design.

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
	No potential effects should be scoped out of the SLVIA.	Accepted, see above.
	A study area of 50 km radius from the Wind Farm Area should be used.	The 50 km study area is described in Section 14.3.
	Changes in visibility from use of larger turbines should be examined using ZTVs.	Changes in visibility compared to the Consented Project are considered in Annex 1 to Appendix 14.1.
	SNH defer to local authorities on viewpoint selection.	See local authority comments below.
	Accepted re-use of photography taken for the Original ES, but note that new photography may be required where baseline changes have occurred, and request new photo from at least one Angus coast viewpoint taken in late afternoon.	New photography has been taken where required. New photography taken from Carnoustie in late afternoon. See Figure 14.22 (Volume 3)
	Larger turbines could alter perspective, appearing closer than the consented turbines – this should be explored using wirelines.	Changes in appearance compared to the Consented Project are considered in Annex 1 to Appendix 14.1.
	Turbine circumference and blade width should be accurately modelled into photomontages.	Turbine circumference and blade width has been modelled in proportion to the dimensions of the turbine.
	The assessment should cover the landscape and visual impacts of turbine lighting.	This is addressed in the assessment of operational impacts.
	Recommend a 'rigorous design process' in relation to other offshore developments.	A collaborative approach to design has not been undertaken due to the differing implementation timescales between the three offshore wind farms. However, current design envelopes were exchanged to inform the cumulative assessment. See Section 14.8.4.
	Methil and Kincardine offshore wind farms should be considered in the cumulative assessment.	These are listed in Section 14.8.4.
<b>Scoping Opinion: Angus Council</b>	Capacity studies for Arbroath, Carnoustie and Monifieth could be relevant to the SLVIA baseline.	These studies were reviewed, but primarily focus on capacity for settlement expansion, so are not referenced specifically.
	Highlighted the visual contrast likely to arise from the difference in turbine size between proposed offshore wind farms.	These differences are considered in the cumulative impact assessment, Section 14.8.4.
	Photography may need to be retaken where turbines now appear in the view.	All locations have been checked and photography retaken where this may alter the assessment.

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
	Suggested locations away from ambient light for night-time visualisations, including the Carmyllie area.	Wirelines were provided to Angus Council as part of follow up consultation, see below.
	Requested detailed ZTVs to inform viewpoint selection.	ZTVs provided for follow up consultation, see below.
<b>Scoping Opinion: Dundee Council</b>	No comment.	N/A.
<b>Scoping Opinion: Fife Council</b>	No comments on SLVIA.	N/A.
<b>Scoping Opinion: East Lothian Council</b>	Existing Areas of Great Landscape Value and proposed Special Landscape Areas should be included in the baseline.	These local landscape designations have been considered, see section 14.6.1.3.
	Greater turbine height could lead to more widespread and more significant effects, and lesser density could lead to more noticeable movement of blades.	These factors are considered throughout the SLVIA, and in Annex 1 to Appendix 14.1.
	'Changes to the character of landscape character types' can be scoped out for non-coastal landscapes, but not for coastal landscapes.	All effects have been scoped in on the advice of Scottish Ministers (see above). Coastal landscapes are covered under the Coastal Character Areas (see Annex 2 to Appendix 14.1).
	Effects on Gardens And Designed Landscapes should be scoped in.	These effects are considered in Section 14.8.2.3.
	A number of onshore and offshore projects are listed for consideration in the cumulative assessment.	These have been included in the assessment. See Section 14.8.4, and detailed list of schemes in Appendix 14.1, Table 7.1 and Table 7.2.
	A number of detailed comments were made in relation to viewpoints and photography, including requests for new and amended viewpoints.	These suggestions were discussed further with consultees. A number of wirelines and ZTVs were provided for follow up consultation, as detailed below.
	Raised potential for significant lighting impacts on the Tantallon to Tynninghame coast. Recommend use of Dunbar and North Berwick viewpoints for night-time visualisations.	Night time effects are discussed at Section 14.8.2, with reference to visualisations from these locations. See Table 14.12 for list of night viewpoint locations.
<b>Scoping Opinion: Scottish Borders Council</b>	Suggested additional viewpoints at Ewieside Hill and Fast Castle.	Wirelines were provided for follow up consultation, see below.

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
<b>Follow up consultation: Scottish Natural Heritage (email 20 October 2017 and subsequent phone calls)</b>	Support the stated approach to wind farm design, request comparison of the proposed layout with a 'most likely' consented scheme.	This comparison is presented in Annex 1 to Appendix 14.1.
	Agree with the approach to night time visualisations, and suggest Tentsmuir and Arbroath as night viewpoint locations.	Arbroath to be used along with others in Angus, on advice of Angus Council. St Andrews used in place of Tentsmuir, as elevated location more likely to enable views of navigation lighting.
	Assessment should consider impacts through twilight and night time, as well as in different daylight conditions.	Different light conditions considered for each viewpoint assessment (see Annex 3 to Appendix 14.1).
<b>Follow up consultation: Scottish Natural Heritage (email 18 December 2017)</b>	Confirmed that there was no requirement to provide cumulative photomontages, and that cumulative representation can be by wireline only.	Cumulative wirelines have been produced for all viewpoints. In addition, supplementary cumulative photomontages have been produced for a selection of key viewpoints. See Section 14.6.2.6.
<b>Follow up consultation: Angus Council (email 9 November 2017 and subsequent phone calls)</b>	Stated agreement with approach to ZTV, viewpoints and photography.	N/A.
	Requested an additional night time visualisation from a location with minimal light pollution.	Follow up conversation agreed night time viewpoints at East Haven and Carmyllie. See Table 14.12 for list of all night viewpoint locations.
	Suggested all turbines over 50 m should be included in the cumulative assessment.	These turbines are not listed or included in modelling, but their presence is recognised in the assessment.
	Cumulative assessment to address design envelopes for other offshore schemes.	'Worst case' for cumulative assessment discussed at Section 14.8.4.
<b>Follow up consultation: East Lothian Council (email 9 November 2017)</b>	Requested additional viewpoint locations on A199, A198, and Hopetoun Monument	These have been included in the viewpoint assessment, see Table 14.11 for full list of representative viewpoints.
	Further locations to be included as wirelines to inform the assessment.	Wirelines for the requested locations are provided in Figures 14.52 (Volume 3) to 14.55 (Volume 3), see Table 14.13.
	Agree with Seabird Centre and Dunbar for night time visualisations. Request an additional night montage from the A199 viewpoint.	This has been included. See Table 14.12 for list of night viewpoint locations.
	Confirmed all relevant wind farms included in proposed cumulative assessment scope.	Scope of cumulative assessment set out in Section 14.8.4.

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
Follow up consultation: Scottish Borders Council (email 11 October 2017)	Confirmed illustration of views from Ewieside Hill and Fast Castle could be with wirelines only.	Wirelines for the requested locations are provided in Figures 14.56 (Volume 3) to 14.57 (Volume 3), see Table 14.13

## 14.5 Impact Assessment Methodology

12. This assessment considers the potential impacts associated with the construction, operation and decommissioning of the Project and the effects on landscape character and visual amenity. The impact assessment process and methodology follows the principles and general approach outlined in Chapter 6: EIA Methodology, modified as appropriate in line with accepted good practice for SLVIA, as set out in GLVIA3. The methodology and parameters assessed have also taken into account issues identified through consultation with stakeholders as summarised in Section 14.4 and the understanding of baseline conditions informed by the data sources referenced in Section 14.3.
13. 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 environmental baseline to identify the potential interactions between the Project and the environment. These are known as the potential impacts and are then assessed to determine a level of significance of effect upon the receiving environment.
14. The key steps in the methodology for SLVIA are as follows:
  - the marine, coastal and landscape character of the study area is analysed, and receptors are identified, informed by desk and field based survey;
  - the area over which the development will potentially be visible is established through the creation of a Zone of Theoretical Visibility (ZTV) map;<sup>1</sup>
  - the visual baseline is recorded in terms of the different groups of receptors (people) who may experience views of the development (informed by the ZTV) and the nature of their existing views and visual amenity;
  - assessment viewpoints are selected (including representative viewpoints, specific viewpoints and illustrative viewpoints) to represent a range of different receptors and views, in consultation with statutory consultees;
  - likely significant effects on landscape and coastal character as a resource and on visual receptors are identified; and
  - the level (and significance) of effects is judged with reference to the sensitivity of the receptor, which considers both susceptibility and value, and the magnitude of impact, which considers a combination of judgements including scale, geographical extent, duration and reversibility.
15. As recommended by GLVIA3, effects on landscape and coastal character and on visual amenity are assessed separately, though given the nature of the Project both assessments are informed by the viewpoint assessment. The detailed methodology for each assessment process is set out in Appendix 14.1, and is summarised below for landscape and visual assessments.

<sup>1</sup> A ZTV indicates areas from where a development is theoretically visible, but cannot show what it would look like, nor indicate the nature or magnitude of any resulting landscape or visual impacts.

### 14.5.1 Assessment and Assignment of Significance

16. The sensitivities of landscape and visual receptors are defined by both the susceptibility of the receptor to an impact from the Project, and the value placed on the resource.

For landscape receptors, criteria including scale, landform, pattern etc. are used to evaluate susceptibility, while value is assessed with reference to factors including scenic qualities, designations and rarity. The definitions of terms relating to the sensitivity of landscape receptors are detailed in Table 14.3.

Table 14.3 Sensitivity of landscape receptors

Receptor sensitivity	Description
<b>Very high</b>	Key characteristics and attributes are highly vulnerable to the type of change proposed. May be within a nationally designated landscape that has rarity and strong scenic qualities.
<b>High</b>	Key characteristics and attributes are vulnerable to the type of change proposed. May be within a nationally or locally designated landscape that is uncommon or particularly scenic.
<b>Medium</b>	Key characteristics and attributes are reasonably resilient to the type of change proposed. May be within a locally designated landscape that has some scenic quality.
<b>Low</b>	Key characteristics and attributes are resilient to the type of change proposed. Unlikely to be designated but may have other indicators of local value.
<b>Very low</b>	Key characteristics and attributes are unlikely to be affected by the type of change proposed. Little or no indication of value.

17. As set out in Appendix 14.1, sensitivity of Coastal Character Areas is described according to a different scale, which derives from a stand-alone report undertaken to inform all offshore wind farm developments in the Forth and Tay area (see Section 14.6.1 and Annex 2 to Appendix 14.1).
18. For visual receptors, susceptibility is mainly a factor of their occupation and the resulting level of attention likely to be given to the view. The value of the view is judged based on indicators such as recognition in maps and guides, presence of seating, or scenic quality. The definitions of terms relating to the sensitivity of visual receptors are detailed in Table 14.4.

Table 14.4: Sensitivity of visual receptors

Receptor sensitivity	Description
<b>Very high</b>	Viewers with proprietary interest and prolonged viewing opportunities, or those who are present mainly to appreciate the view, and where there are open marine views. Views may be recognised as important to a national designation or widely promoted for their scenic value. For example: residents in large coastal settlements; people at nationally valued viewpoints.
<b>High</b>	Viewers with proprietary interest, or people whose attention is likely to be focused on appreciation of their surroundings, including open marine views. Views may be recognised in relation to local designations, or marked as viewpoints on maps. For example: residents in smaller coastal settlements/houses; users of coastal footpaths/cycleways; or visitors to locally promoted viewpoints.

Receptor sensitivity	Description
<b>Medium</b>	Viewers with a passing interest in their environment such as those travelling in vehicles on scenic routes and tourist routes, where attention is focussed on the surrounding landscape, but is transitory. Views that may be locally recognised and valued for their scenic quality. For example: people on non-coastal cycleways; a local viewpoint indicated by a bench at the edge of a village.
<b>Low</b>	People travelling more rapidly on major road, rail or transport routes that are not recognised as scenic routes, and/or those engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape. Views are unlikely to be recognised for their scenic quality. For example: people passing on the A1 or main line railway.
<b>Very low</b>	People whose attention is not on their surroundings, who may be primarily indoors, and where setting is not important to their activity. No indications that value is placed on views. For example: people at their place of work.

19. The magnitude of impact is defined by a series of factors including the scale of the change, its geographical extent, and its duration and reversibility. The definitions of the levels of magnitude used in this assessment in respect of landscape and visual impacts are described in Table 14.5 and Table 14.6.

Table 14.5: Magnitude of impact on the landscape

Magnitude	Definition
<b>Very high</b>	Extensive changes in key characteristics, including potential creation of new characteristics, across a regional-scale area. And/or a change that is long-term and likely to be permanent and irreversible.
<b>High</b>	Changes in key characteristics, including potential creation of new characteristics, across a district-scale area. And/or a change that is long-term but may be at least partly reversible.
<b>Medium</b>	Some changes in key characteristics, including potential creation of new characteristics, across a local-scale area. And/or a change that is medium-term or short-term, and likely to be at least partly reversible.
<b>Low</b>	Limited changes in key characteristics, including potential creation of new characteristics, across a localised area. And/or a change that is medium-term or short-term, and likely to be fully reversible.
<b>Very low</b>	Little or no change in key characteristics, across a very localised area. And/or a change that is short-term and likely to be fully reversible.

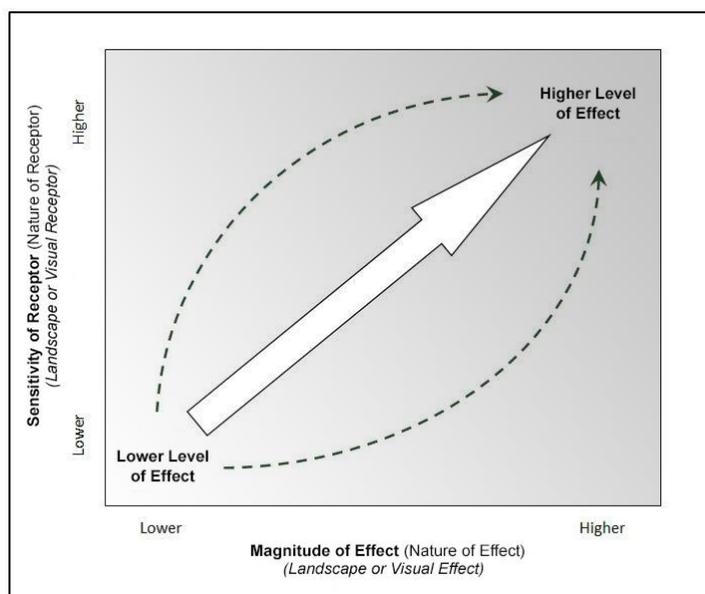
Table 14.6: Magnitude of impact on visual amenity

Magnitude	Definition
<b>Very high</b>	Extensive visual change, likely to result from the Project being the main, focal feature in the view. Strong contrast with existing views and changes in scenic quality, experienced across a regional-scale area. And/or a change that is long-term and likely to be permanent and irreversible.

Magnitude	Definition
High	Extensive visual change, likely to result from the Project being a focal feature in the view. Contrast with existing views and changes in scenic quality, experienced across a district-scale area. And/or a change that is long-term but may be at least partly reversible.
Medium	Some visual change, likely to result from the Project being a feature in the view. More limited contrast with existing views and limited changes in scenic quality, experienced across a local-scale area. And/or a change that is medium-term or short-term, and likely to be at least partly reversible.
Low	Limited visual change, likely to result from the Project being visible in the view. Limited changes in scenic quality, experienced across a localised area. And/or a change that is medium-term or short-term, and likely to be fully reversible.
Very low	Little or no visual change, likely to result from occasional or glimpsed views of the Project. Little change in scenic quality across a very localised area. And/or a change that is short-term and likely to be fully reversible.

- The magnitude of the impact is correlated against the sensitivity of the receptor to provide a level of significance. In line with guidance provided in GLVIA3, a matrix is not used. Instead, judgements are made on a case by case basis, guided by the principles set out in Illustration 14.1. Levels of visual effect are identified as negligible, minor, moderate or major. For the purposes of this assessment, any effect that is judged to be major or moderate is considered to be significant in the context of the EIA Regulations.
- The direction of effects (beneficial or adverse) is determined in relation to the degree to which the Project fits with the existing landscape or view, and/or the contribution made by the Project, even if it is in contrast to the existing character of the view. With regard to wind energy development there is a broad spectrum of response from the strongly positive to the strongly negative. However, to cover the 'maximum effect' situation, for the purposes of this SLVIA potential effects are assumed to be adverse.

Illustration 14.1 Judging levels of effect



### 14.5.2 Uncertainty and Technical Difficulties Encountered

22. The SLVIA has assumed a ‘worst-case’ scenario as described in Section 14.7 below. This adopts a range of maximum design parameters that may not reflect the final development, but does provide a realistic worst case scenario for assessment. This approach ensures that the eventual design will be certain to fall within the assessed parameters.
23. In relation to turbine lighting for aviation and navigation, assumptions have been made as to the number, position and brightness of the lights. Although based on statutory requirements and recommendations, the final arrangement of lights will be subject to consultation with the relevant statutory bodies and approval by MS-LOT. Particular uncertainty applies to the relative brightness of the aviation and navigation lights, which are specified differently. Aviation lights have been modelled at the specified 2000 candela, but navigation lights are specified by the minimum visible distance (either 2 nautical miles (NM) or 5NM). Precautionary assumptions have been made that these distances equate to 50 candela and 500 candela, and these specifications have been modelled.

### 14.6 Baseline Description

24. This section sets out the existing conditions within the 50 km study area, and describes the baseline against which the assessment of changes in seascape, landscape and views is undertaken. This section provides information about:
  - the character of the coastal part of the study area;
  - the character of the non-coastal landscapes of the study area;
  - landscape designations within the study area; and
  - existing visual amenity.
25. The study area is further refined through mapping of the Zone of Theoretical Visibility (ZTV) of the Offshore Wind Farm. The ZTV indicates areas from where the Offshore Wind Farm is theoretically visible, but cannot indicate the nature or magnitude of any resulting landscape or visual impacts. ZTVs have been calculated to show the visibility of the maximum blade tip height and hub height, and these are shown in Figure 14.2 (Volume 3) and 14.3 (Volume 3) respectively.

#### 14.6.1 Seascape and Landscape

##### 14.6.1.1 Coastal Character

26. The baseline seascape character is described in *Seascape Character Assessment: Aberdeen to Holy Island*, included as Annex 2 to Appendix 14.1. This document was prepared in 2012 specifically to inform the SLVIA of offshore wind farms in the Forth and Tay area and was submitted alongside the Original ES.
27. The seascape character assessment defines 21 ‘Regional Seascape Units’ along the coast, and includes an assessment of each area’s sensitivity to offshore wind farm development. There are 16 Regional Seascape Units within the study area. Regional Seascape Units considered in the assessment are listed in Table 14.7 and are shown on Figure 14.4 (Volume 3).

Table 14.7: Regional Seascape Units

Regional Seascape Unit	Brief summary of key characteristics
SA4: Montrose	Long, sweeping beach backed by cliffs to the north around St Cyrus, and by low lying coastal settlement and promenade at Montrose.
SA5: Long Craig	Rocky headland and associated agricultural hinterland that stretches between Scurdie Ness in the north and Lunan Bay to the south.

Regional Seascape Unit	Brief summary of key characteristics
<b>SA6: Lunan Bay</b>	Broad sandy beach between Boddin Point and the Lang Craig, backed by dunes and framed by low cliffs the north and south.
<b>SA7: Lang Craig to the Deil's Head</b>	Continuous stretch of sea cliffs, reaching up to 50 m, and associated rocky coastline between Lang Craig and Whiting Ness.
<b>SA8: Arbroath to Monifieth</b>	Low lying coast with rock-cut platforms, areas of dunes, and backed by settlement.
<b>SA9: Dundee</b>	Developed and settled coastal edge between Monifieth and Invergowrie, centred on Dundee.
<b>SA10: Inner Firth of Tay</b>	The Inner Firth of Tay includes a narrow strip of land adjacent to the southern coastline and the extensive area of predominantly low-lying farmland of the Carse of Gowrie.
<b>SA11: St Andrews Bay</b>	Large stretch of sandy coastline backed by dunes and forestry between Tayport and St Andrews.
<b>SA12: St Andrews to Fife Ness</b>	Gently sloping agricultural hinterland, rocky coastline and low cliffs stretching between St Andrews and Fife Ness.
<b>SA13: East Neuk of Fife</b>	Rocky coastline and shingle beaches between Fife Ness and Earlsferry, including agricultural hinterland and fishing villages.
<b>SA14: Kirkcaldy and Largo Bay</b>	Generally low-lying coast of sandy beaches and bays, backed by large coastal settlements with an industrial character.
<b>SA16: Edinburgh to Gullane</b>	Broad bay including the built-up shoreline of Portobello, Musselburgh, Cockenzie and Port Seton, as well as the less developed East Lothian coast around Gullane.
<b>SA17: Eyebroughy to Torness Point</b>	Generally low-lying coast, with an alternation of rocky headlands and sandy pocket bays, backed by relatively unfragmented agricultural land and towns.
<b>SA18: Torness Point to St Abb's Head</b>	Coastline formed by high, near vertical cliffs, with a barren, exposed character and dramatic open views.
<b>SA19: St Abb's Head to Eyemouth</b>	Diverse coastal landscape of rugged sea cliffs with sheltered folds and valleys, rising to the dramatic St Abb's Head.
<b>SA20: Eyemouth to Berwick upon Tweed</b>	Linear coastline of rocky cliffs and several small headlands, with undulating hinterland and major transport corridor close to the coast.

#### 14.6.1.2 Landscape Character

28. The landscape character of the onshore part of the study area is defined in a series of landscape character assessments (LCA) published by SNH, covering Aberdeenshire, Angus, Fife, The Lothians and The Borders (ASH Consultants, 1998a; ASH Consultants, 1998b; David Tyldesley and Associates, 1999; Environmental Resources Management, 1998; Land Use Consultants, 1999), and for Northumberland in the Countryside Character of England, Volume 1: North East England landscape character assessment published by Natural England (Countryside Commission, 1996).
29. A total of 33 landscape character types (LCTs) are present in the study area (not including 'urban' areas) as shown in Figure 14.5 (Volume 3). In order to focus on potentially significant effects, the LCTs were examined to identify those in which marine views are important. This involved a review of the written descriptions in the published LCA reports to ascertain whether marine or coastal views are identified as a key characteristic of each unit, followed by verification in the field. A further cross-check was undertaken with the ZTV to identify any units which have only limited visibility of the Project, and were therefore unlikely to be affected.

30. LCTs with no or very limited theoretical visibility of the development were excluded from the baseline. LCTs with some view, but where marine views are not characteristic, were also excluded. This scoping exercise, set out in detail in Appendix 14.1, concluded that 15 LCTs had coastal/marine views or characteristics, and were within the ZTV. These LCTs form the landscape character baseline, and are described further in Appendix 14.1. LCTs considered in the assessment are listed in Table 14.8 and are shown on Figure 14.5 (Volume 3).

Table 14.8: Landscape Character Types included in the SLVIA

Landscape Character Type (numbers refer to Figure 14.5 (Volume 3))		Brief summary of key characteristics
1	Coastal Hills Headlands Plateaux and Moorlands	Expansive, flat to gently rolling coastal plateau, with predominantly large, open, undulating arable fields, coarse grassland, and heather moorland. Limited woodland cover, infrequent settlements. A medium to large-scale, open or exposed coastal landscape.
4	Coastal Margins	Transitional landscape between hills and sea, ranging from rolling hills to virtually flat coastal plain. Medium to large arable fields and extensive estate woodlands, wind-sculpted coastal woods, scattered hedgerow trees and shelterbelts. Distinctive coastal settlements and man-made features.
5	Coastal Raised Beaches and Terraces	Mostly flat or gently sloping landform, forming a transition between hills and coastal flats. Open, arable fields with some hedgerows, or stone dykes or post and wire fencing. Limited woodland cover except policy planting and shelterbelts, some built-up areas.
6	Dipslope Farmland	Land generally sloping down towards the coast, from low outlying hills. Productive agricultural land, with woodland cover limited to shelterbelts, except on large estates and along river corridors. Dispersed settlement pattern.
9	Fife Lowland Farmland	Varied and subtle landform, predominantly large, open, regular arable fields. Extensive woodland on lower ground. Dispersed farmsteads and occasional villages and towns well related to the landscape.
11	Foothills	Highly conspicuous hills, forming a backdrop in wider views. Modest in height, the foothills are occasionally steep-sided and rugged. A mix of arable and pastoral farmland, with burns in gullies or small valleys. General lack of settlement.
15	Low Coastal Farmlands	Strongly varied topography with rock outcrops, mounds, and rolling terrain interrupted by narrow, deeply incised valleys. Land cover of arable and pastoral fields, with rough pasture and scattered gorse scrub on steep ground. Coastal villages and scattered small farms and cottages, and transport corridors.
16	Lowland Coastal Flats Sands and Dunes	Flat, low-lying, large-scale, exposed coastal landscapes. Intensively cultivated landscape of geometrical arable fields and extensive forestry plantations. Industrial and other man-made developments including golf courses.
20	Lowland Hills (South)	Distinctive hills, aligned east-northeast, with prominent northwest-facing crags. Arable land with grazing on upper slopes, and scattered areas of deciduous woodland. Limited development aside from farmsteads.

Landscape Character Type (numbers refer to Figure 14.5 (Volume 3))		Brief summary of key characteristics
22	Lowland Plains	Extensive, gently undulating plain, interrupted by rugged volcanic hills. Chequerboard pattern of large arable fields with pasture on higher ground, and prominent policy woodlands. Dispersed settlement pattern with larger settlements having extensive 20th-century housing developments.
23	Lowland River Valleys	Small twisting rivers within shallow, narrow incised valleys. Arable land on gentler slopes, with pasture on the valley floor. Clipped hedges with hedgerow trees. Extensive mixed and broadleaf woodlands, including policy woodlands. Small villages.
24	Narrow Wooded River Valleys	Narrow, deep, gorge-like valleys cut into surrounding hills by fast flowing burns. Semi-natural woodlands on the steeply sloping banks. Occasional small villages and many historic buildings.
26	Pronounced Hills	Pronounced, often distinctive hills protruding high above the lowlands. Steep rugged hilltops, with more vegetated and more intensively used lower slopes. Mixed woodlands and burns in valleys. Farmsteads and quarries.
29	Upland Fringe Moorland and Grassland: the Lammermuir, Pentland and Moorfoot Hills	Steep hills and flat or gently rolling plateau, descending to low rounded hills dissected by incised valleys. Some arable on lower ground but predominantly pasture and rough grazing. Stone walls and occasional hedges with hedgerow trees. Ancient woodland along narrow valleys. Limited settlement.
32	Upland Hills: the Lammermuir, Pentland and Moorfoot Hills	Smooth convex hills and level-topped ridges forming a broad, gently undulating plateau, dissected by small and large incised valleys. Peatland, heather and grass moorland, with occasional improved pasture in valleys. Very limited tree cover aside from coniferous plantations. Few farms or roads, overhead power lines are prominent.

#### 14.6.1.3 Landscape Designations

31. Since effects on coastal and landscape character are already assessed, landscape designations are not assessed as discrete receptors since this would lead to double counting of effects. Instead, the special qualities of each landscape designation are evaluated against the findings of the coastal and landscape impact assessment, to determine whether the designated area would be adversely affected by the Offshore Wind Farm.
32. The offshore part of the study area is not designated for visual or aesthetic reasons. Only onshore landscape designations are therefore considered. Landscape designations are shown on Figure 14.6 (Volume 3).
33. There are no National Parks, National Scenic Areas or Areas of Outstanding Natural Beauty within the study area.
34. There are 49 sites listed on the Inventory of Gardens and Designed Landscapes in Scotland within the study area (Historic Scotland, 1987-2017). As with LCTs, a scoping exercise was undertaken, set out in detail in Appendix 14.1, to identify those Gardens and Designed Landscapes (GDLs) which are within the ZTV, and from which marine views are important, as noted in the Inventory descriptions. A total of eight GDLs were included within the baseline, and are listed in Table 14.9. Impacts on the historic environment value of the GDLs are considered in Chapter 13: Cultural Heritage.

Table 14.9: Gardens and Designed Landscapes included in the SLVIA

Site name	Brief description	Distance from Wind Farm Area (km)
<b>St Andrews Links</b>	Some of the oldest public links golf courses in the world, renowned as the Home of Golf. Provides an important coastal scenic setting for St. Andrews.	30
<b>Cambo</b>	Good example of late 18th and early 19th-century coastal policies embracing model farms, picturesque estate layout, mid-20th-century golf course and gardens of botanical and horticultural interest.	19
<b>Grey Walls</b>	An important example of Edwin Lutyens' 20th century design style.	39
<b>Leuchie</b>	An early 19th century informal landscape of parkland, woodland, lawns and walled garden that together form an attractive setting for Leuchie House.	32
<b>Tynninghame</b>	Outstanding landscape, which still has its 18th century structure, within which can be seen 19th century development and the particularly fine 20th century gardens.	30
<b>Biel</b>	A beautiful designed landscape particularly notable for the terraced gardens, arboretum and outstanding architectural features. Makes an important contribution to the surrounding scenery.	33
<b>Broxmouth Park</b>	A remarkable example of late 17th/early 18th century formal landscape associated with the Battle of Dunbar, laid out around a series of long-distance vistas.	28
<b>Dunglass</b>	A fine example of the late 18th century picturesque style of landscape design. Of particular value are the gorges, woods, rocks and water features seen as early sublime features in the picturesque design.	31

35. A number of local landscape designations lie within the study area, within Aberdeenshire, Fife, East Lothian and the Scottish Borders. A scoping exercise was undertaken to identify those local designations where the coast or coastal views are among the reasons for designation, and where the ZTV indicated the potential for these reasons to be affected. All local landscape designations identified as being relevant to the assessment are listed in Table 14.10, and are illustrated in Figure 14.6 (Volume 3).<sup>2</sup>

Table 14.10: Local Landscape Designations included in the SLVIA

Designation name and local authority	Local authority	Distance from Wind Farm Area (km)
<b>South-East Aberdeenshire Coast Special Landscape Area (SLA) (part only)</b>	Aberdeenshire	47
<b>Tentsmuir Coast Local Landscape Area (LLA)</b>	Fife	31
<b>St Andrews Links LLA</b>	Fife	29

<sup>2</sup> East Lothian Council requested assessment of both existing local landscape designations and the proposed SLAs that will shortly supersede them. The SLAs are listed here, and existing designations are considered in Annex 4 to Appendix 14.1.

Designation name and local authority	Local authority	Distance from Wind Farm Area (km)
St Andrews to Fife Ness LLA	Fife	15.5
East Neuk LLA	Fife	18
Forth Islands LLA (Isle of May only)	Fife	16
Port Seton to North Berwick Coast SLA	East Lothian	31
North Berwick Law SLA	East Lothian	31
Tantallon Coast SLA	East Lothian	27
Belhaven Bay SLA	East Lothian	28
Dunbar to Barns Ness Coast SLA	East Lothian	27
Thorntonloch to Dunglass Coast SLA	East Lothian	28
Berwickshire Coast SLA	Scottish Borders	30

## 14.6.2 Visual Amenity

### 14.6.2.1 Visibility

36. The Met Office records visibility on a regular basis. Data were obtained from the Met Office, giving average visibility recorded at Leuchars over a 10 year period from January 2007 to December 2016. These data are presented in Table 3.8 in Appendix 14.1. They show that visibility reduces steadily with distance from the observation point. The following observations can be made:

- There is no visibility beyond 15 km for 14% of the time, suggesting that the wind turbines would not be visible from Fife Ness on 51 days per year;
- There is no visibility beyond 30 km for 37% of the time, suggesting that the turbines would not be visible from most of Angus or East Lothian on 135 days per year; and
- There is no visibility beyond 50 km for 75% of the time, suggesting that the turbines would not be visible from the outer edge of the study area on 274 days per year.

37. This information is noted for each viewpoint in Annex 3 to Appendix 14.1. While this information provides background data, it is acknowledged that many viewers, particularly recreational users, are more likely to be present when conditions and hence visibility are better. Therefore, all assessment work has been carried out in good visibility, and these conditions are considered in the assessment of impacts.

### 14.6.2.2 Visual Receptors

38. Likely viewers or visual receptors of the offshore wind farm include:

- Residents living in any of the settlements or individual residences across the area which lies within the ZTV of the wind farm;
- Tourists visiting, staying in, or travelling through the area within the ZTV;
- Recreational users of the landscape, including those using golf courses, cycle routes and footpaths;
- Recreational users of the marine environment, including those involved in yachting, angling, people on boat trips to the Isle of May, and passengers on ships;

- People (tourists, workers, visitors or local people) using transport (road and rail) routes passing through the study area;
- People working in the countryside or in any of the towns, villages or dwellings across the area lying within the ZTV of the wind farm; and
- People working in the marine environment, such as fishermen and crews of ships.

39. Detailed consideration of the most sensitive visual receptors is included in Appendix 14.1.

### 14.6.2.3 Assessment Viewpoints

40. Assessment viewpoints were selected to be representative of views from the landward parts of the 50 km radius study area, reflecting places and routes frequented by the public. They were chosen through field work and a study of maps, to represent key locations where the public may view the offshore development.
41. For the purposes of the Original ES SLVIA, viewpoints were selected in 2011 in consultation with interested statutory consultees (including SNH and MS-LOT) and LPAs (Aberdeenshire, Angus, Dundee, Fife, East Lothian and Scottish Borders), initially as cumulative viewpoints. A total of 21 viewpoints were selected for use in relation to all Forth and Tay offshore wind farms, of which 18 are within the 50 km study area.
42. Following submission of the Original ES, some additional viewpoints were identified by stakeholders as being of relevance to the assessment, and were included in the Addendum.
43. Consultation undertaken through Scoping and subsequent correspondence for the current application has identified further viewpoints for assessment. All assessment viewpoints considered in this SLVIA are listed in Table 14.11, and their locations are shown on the ZTVs in Figures 14.2 (Volume 3) and 14.3 (Volume 3).
44. Some of the SLVIA viewpoints are also considered in Chapter 13: Cultural Heritage. The SLVIA considers the effect on views experienced by people, while the cultural heritage assessment considers the effect on the setting of a particular historic environment asset. Though related, these are different assessments and so conclusions may be considerably different.

Table 14.11: Representative Viewpoints

No.	Viewpoint	Distance to closest turbine (km)	Reason for Selection
2	Beach Road, Kirkton, St Cyrus	49.0	Car park offering beach access, and wide elevated views over Montrose Bay, on a coastal footpath.
5	Dodd Hill	43.9	Inland location on walking route offering views across Angus to the coast.
6	Braehead of Lunan	39.0	Representative of views from a hamlet, located on National Cycle Network (NCN) Route 1, enables views south over Red Head.
7	Arbroath Signal Tower	30.8	Listed building with an elevated platform and historic connection to the Bell Rock, now a museum.
8	Carnoustie	31.7	Recently upgraded promenade with car parking and beach access.
9	Dundee Law	44.9	Most prominent viewpoint in Dundee, a popular recreational location with large numbers of visitors, and long views down the Firth of Tay.

No.	Viewpoint	Distance to closest turbine (km)	Reason for Selection
10	Tentsmuir	31.8	Forestry Commission car park in a popular recreational area. Views across sandbanks. Located on Fife Coastal Path and NCN Route 1.
11	Strathkinness	33.1	Within coastal hills, small settlement overlooking St Andrews and the Firth of Tay.
12	St Andrews, East Scores	28.2	Popular location within the town, by the abbey, overlooking St Andrews Bay, on the Fife Coastal Path.
13	Fife Ness, Lochaber Rock	15.5	Easternmost point of Fife, unobstructed views across the outer Firth and Tay, on the Fife Coastal Path.
14	Anstruther Easter	21.8	Representative of views from a coastal settlement at a local play park with foreshore access, on the Fife Coastal Path.
15	Largo Law	36.8	Elevated location, enabling wide views across the Firth of Forth, on a locally-signposted footpath
16	Isle of May	16.3	The island is a popular day-trip destination, and a useful proxy for marine views.
17	North Berwick Law	33.0	Popular walking destination close to North Berwick, enabling wide views over the Firth of Forth.
18	Dunbar	28.0	Representative of views from coastal settlement, on the John Muir Way long-distance path.
19	Innerwick	30.4	Elevated viewpoint from a small settlement, enabling views across the coastal plain to the Firth of Forth.
20	Coldingham Moor	32.8	Elevated headland with wide seaward views, enabling northward views over the Firth of Forth.
21	St Abb's Head	33.0	Marked as a viewpoint on OS map, within National Trust for Scotland access land, offering extensive coastal views.
22	St Andrews, West Sands	29.9	Recreational location close to the town of St Andrews, with important associations between golf course and coast.
23	Crail	18.4	Fishing village on the Fife coast, popular with visitors and with open views across the outer Firth of Forth.
24	Scottish Seabird Centre, North Berwick	32.4	Popular visitor location close to the settlement centre, with coastal views towards the Bass Rock.
25	Tantallon Castle	29.3	Popular visitor attraction on elevated coast, with views over the Forth including the Bass Rock.
26	Broad Sands, North Berwick	34.9	Views across the Forth, including the inshore islands, from this popular beach near North Berwick.
27	A198, North Berwick	30.2	Views to the Bass Rock from a tourist route and core path.

No.	Viewpoint	Distance to closest turbine (km)	Reason for Selection
28	A199, East Linton	36.1	Views from higher ground across Belhaven Bay from a tourist route and core path.
29	Hopetoun Monument	42.0	View from the top of a hilltop monument, which offers panoramic vistas across East Lothian.

#### 14.6.2.4 Night Time Assessment Viewpoints

45. Due to the statutory requirement to install visible aviation and navigation lighting on some of the wind turbines and the Offshore Substation Platform(s) (OSP(s)), an assessment of effects during the hours of darkness has been carried out. A smaller selection of viewpoints, including some of those listed in Table 14.11, was included in this night-time assessment. These were agreed with stakeholders to represent a range of viewpoints where people are most likely to be present during darkness, i.e. populated places rather than coastal walks or beaches. The eight representative night-time viewpoints are listed in Table 14.12, and their locations are shown on the ZTVs in Figures 14.2 (Volume 3) and 14.3 (Volume 3).

Table 14.12 Representative Night-time Viewpoints

No.	Viewpoint	Distance to closest turbine (km)	Reason for Selection
N1	King's Road, Arbroath	30.1	Located close to the town, but away from the brightest lights
N2	Carmyllie	38.4	An elevated inland location with limited light intrusion
N3	East Haven	31.7	A coastal location with limited light intrusion
N4	St Andrews, East Scores	28.2	Popular location close to the settlement centre, likely to be frequented at night.
N5	Crail	18.4	Location in the settlement, likely to be frequented at night.
N6	North Berwick Seabird Centre	32.4	Popular location close to the settlement centre, likely to be frequented at night.
N7	Dunbar	28.0	Location in the settlement, likely to be frequented at night.
N8	A199, East Linton	36.1	Views from higher ground across Belhaven Bay from a route likely to be well used at night.

#### 14.6.2.5 Additional Viewpoints

46. In addition to the assessment viewpoints, the illustration of a number of specific viewpoints was requested by statutory consultees. These locations were considered to be of interest, but detailed assessment was not required. Most of these viewpoints illustrate views from more distant locations, or views that are similar to locations listed in Table 14.11. The additional viewpoints are listed in Table 14.13, and their locations are shown on the ZTVs in Figures 14.2 (Volume 3) and 14.3 (Volume 3).

Table 14.13: Additional viewpoints illustrated with wirelines

No.	Viewpoint	Distance to closest turbine (km)	Reason for Selection
A1	West Steel	35.0	A viewpoint in the Lammermuirs used in the Original SLVIA, replaced with Innerwick as requested by East Lothian Council.
A2	Traprain Law	37.4	Requested by East Lothian Council to illustrate the view over Belhaven Bay from this prominent hill.
A3	B6370 north of Garvald	39.7	Requested by East Lothian Council to illustrate the view from the lower fringe of the Lammermuirs.
A4	B6355 west of B6368	48.0	Requested by East Lothian Council to illustrate distant view from inland location.
A5	Ewieside Hill	34.0	Requested by Scottish Borders Council to illustrate the elevated view over Cockburnspath.
A6	Fast Castle	31.5	Requested by Scottish Borders Council to illustrate the view from a cliff top historic site.

#### 14.6.2.6 Visualisations

47. Rendered photomontage visualisations have been prepared for all viewpoints listed in Table 14.11 and Table 14.12. These are presented in Figures 14.18 (Volume 3) to 14.51 (Volume 3), and include wirelines showing the Inch Cape and Seagreen offshore wind farms. In addition, cumulative photomontages showing the Offshore Wind Farm with Inch Cape and Seagreen have been produced for five key viewpoints: VP 7 Arbroath Signal Tower; VP 12 St Andrews, East Scores; VP 13 Fife Ness; VP 17 North Berwick Law; and VP 21 St Abb's Head. Wirelines for viewpoints listed in Table 14.13 are presented in Figures 14.52 (Volume 3) to 14.57 (Volume 3). The methodology for preparing these visualisations is included in Section 2 of Appendix 14.1.

#### 14.6.3 Development of Baseline Conditions without the Project

48. In the absence of the Project, it is likely that the Wind Farm Area will remain an area of open sea. The character of coastal landscapes, and the nature of views out to sea, will remain largely unchanged in the short term, though natural processes and human activities will continue to shape the coast.

### 14.7 Design Envelope – Worst Case Design Scenario

49. The Application is for the construction, operation and decommissioning of an offshore wind farm with a maximum output of 450 MW, comprising a maximum of 54 turbines. The assessment scenarios identified in respect of the SLVIA have been selected as those having potential to represent the greatest effect on an identified receptor based on the design envelope described in Chapter 4: Project Description.

50. The worst case design scenarios for SLVIA are set out in Table 14.14.

Table 14.14: Design envelope scenario assessed for SLVIA

Potential Impact	Worst Case Design Scenario	Justification
<b>Construction</b>		
<b>Impact of landfall construction activities on landscape receptors at Thorntonloch Beach</b>	Both open trenching and HDD have been considered for the installation of the Offshore Export Cable at the landfall.	Both methods involve visible disturbance to coastal landscape features and could give rise to significant adverse effects.
<b>Impact of landfall construction activities on visual receptors at Thorntonloch Beach</b>	Open trenching will require a construction width of 30 m across the beach, for approximately 3 months.  HDD will require a sheet-piled dry area of up to 400 m <sup>2</sup> to be established below low water, for approximately 4 months.	
<b>Operation</b>		
<b>Impact of the Offshore Wind Farm on coastal character</b>	54 turbines, with a blade tip height of 208 m (above LAT), including a rotor diameter of 167 m and a hub height of 126 m (above LAT).  Two OSPs installed within the Wind Farm Area.	Maximum turbine dimensions within the design envelope.
<b>Impact of the Offshore Wind Farm on landscape character</b>		Maximum number of OSPs within the design envelope.
<b>Impact of the Offshore Wind Farm on visual amenity</b>		Likely to give rise to most widespread visibility and greatest potential effect.
<b>Impact of aviation and navigation lighting on coastal character</b>	Lighting installed in line with CAA and IALA requirements.  2000 candela aviation lights fitted on nacelles of 33 peripheral turbines, flashing Morse W (dot dash dash).	Likely worst case number of lights. Brighter than are likely to be installed, to ensure worst case assessed.  Higher position of navigation lights means they are more likely to be visible from shore.
<b>Impact of aviation and navigation lighting on landscape character</b>	500 candela navigation lights with 5-second flash fitted on nine 'significant peripheral structures'.  50 candela navigation lights with 2.5-second flash fitted on six 'intermediate peripheral structures'.	
<b>Impact of aviation and navigation lighting on visual amenity</b>	All navigation lights fitted at maximum 36.5 m above LAT.	

### 14.7.1 Embedded Mitigation

- It is acknowledged that traditional methods of landscape and visual mitigation, such as screen planting, are ineffective for offshore wind farm development. Mitigation for wind farms is generally limited to the reduction of potential direct effects through detailed siting, and the reduction in adverse aesthetic effects through wind farm design. This is made clear in Siting and Designing Wind Farms in the Landscape (SNH, 2017a).

52. In order to consider the aesthetic aspects of wind farm design, an analysis was undertaken of alternative layouts, and this is presented in Annex 1 of Appendix 14.1. This provides 'design objectives' that can be considered in order to refine the appearance of the final layout. Detailed siting of the turbines will also be driven by a range of physical and environmental constraints including localised geological conditions, bathymetry, ecology, aviation, navigation, wind resource, and marine archaeology.
53. Detailed design of the aviation and navigation lighting will also take place post-consent, in line with the requirements of the relevant statutory authorities. It is possible that the lights installed may be less bright than those modelled and assessed, such that actual impacts could be less than is assessed in this SLVIA.
54. Since the wind farm design is dependent on detailed design that will only take place post-consent, this mitigation cannot be adopted into the Project design at this stage.

### 14.7.2 Anticipated Consent Conditions

55. A number of consent conditions were attached to the Original 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 environmental risk commensurate with the design envelope, where it remains necessary to do so.
56. Table 14.15 sets out the conditions attached to The Consents which have relevance to the management of effects on seascape, landscape and visual amenity.

Table 14.15 Consent conditions for the Originally Consented Project relevant to Seascape Landscape and Visual impacts

Original Consent Requirement	Relevance to seascape landscape and visual impacts
<b>Development Specification and Layout Plan</b>	Setting out, for approval, the final design and layout of the Project to ensure it remains consistent with the design assessed in the ES as relevant to SLVIA.
<b>Design Statement</b>	Providing representative visualisations of the Offshore Wind Farm based on the final Development Specification and Layout Plan. The requirements for the design statement will be discussed with MS-LOT and relevant stakeholders following award of consent.
<b>Lighting and Marking Plan</b>	Setting out, for approval, how the Offshore Wind Farm will be lit and marked in accordance with the current aviation and navigation policy and guidance.

## 14.8 Impact Assessment

57. This section addresses the impacts associated with construction, operation and maintenance and decommissioning, of the Project, on landscape and visual receptors in the study area.

### 14.8.1 Construction Phase Impacts

58. The impacts resulting from the construction of the Project have been assessed on landscape and visual receptors identified within the study area. A discussion of the likely significant effect resulting from each impact is presented below.
59. Impacts on landscape and visual amenity may arise as a result of the following activities associated with construction of the Offshore Wind Farm and Offshore Transmission Works:

- Movement of installation vessels, cranes and other equipment visible in and around the Wind Farm Area;
- Views of turbines and other structures under construction; and
- Laying of the subsea cables, particularly the Offshore Export Cable where it connects to the Onshore Export Cable.

60. Construction activities may affect landscape resources and views in areas where they can be seen. The ZTV maps (Figures 14.2 (Volume 3) and 14.3 (Volume 3)) indicate the extent of theoretical visibility of the proposed Offshore Wind Farm. The extent of theoretical visibility for the site during construction would initially be much smaller, being limited to areas with views of the Wind Farm Area. As construction progresses, visibility of the works, including vessels, cranes and partially-built structures, will increase as more turbines are erected. As such, potential impacts arising from the construction phase of the Project will never be significantly greater than those arising from the operational phase. Visibility of vessels outside the Wind Farm Area is not considered likely to give rise to any significant impacts on landscape or visual amenity. Construction phase impacts will be short term (2-3 years).
61. The pattern of any impacts would be the same for construction activities as it would be for operational activities. While it is acknowledged that there are likely to be significant effects arising from views of the Offshore Wind Farm under construction, they have not been assessed separately. Operational phase impacts are assessed in Section 14.8.2. Construction impacts associated with the landfall only are assessed in detail below.

#### 14.8.1.1 Impact of landfall construction activities on landscape receptors at Thorntonloch Beach

62. The method for landing the Offshore Export Cable at Thorntonloch beach is dependent on ground conditions. The options currently being considered are horizontal directional drilling (HDD) and open cut trenching.
63. If HDD is used, the drill will pass from landward of Thorntonloch Beach, to a point below mean low water springs (MLWS), i.e. within the water. To complete the operation, a temporary dry area may need to be established below MLWS, using sheet piling driven into the sand. Impacts on the coastal landscape of the beach arising from this temporary works area would be medium in scale, small in extent, short term and reversible.
64. If open trenching is required, Thorntonloch beach will be directly affected by excavation and burial works. This would be a large-scale impact across a small geographical extent, and would be short term and reversible.
65. The sensitivity of the coast at this location is high, due to the susceptibility of the beach landscape to change and the value placed upon the landscape. For either HDD or open trenching, the effect will be minor and not significant.

#### 14.8.1.2 Impact of landfall construction activities on visual receptors at Thorntonloch Beach

66. The visual disturbance arising from either HDD or open trenching is likely to be seen by residents of a small number of nearby properties, people at the caravan park, and walkers on the beach and coastal footpaths. These recreational and residential viewers are considered to have a high sensitivity to change.
67. If open trenching is used, the scale of impact on these receptors will be large, but affecting a small geographical extent. The impact will be short term and reversible. The impact will be minor and not significant.
68. Should the HDD method be used, this would lessen the visual intrusion of construction activities on the beach, though the dry area below MLWS would be clearly visible. In this case, impacts are also predicted to be minor and not significant.

## 14.8.2 Operational Phase Impacts

69. Impacts on landscape character and visual amenity may arise as a result of the following aspects of the offshore development:
- Introduction of wind turbines and OSP(s) within an area of formerly open sea;
  - Introduction of night-time lighting of the turbines; and
  - Operational activities such as operational and maintenance vessel movements.
70. This would result in potential changes to the perception of coastal and landscape character, and to the visual amenity of people, within the study area.
71. There will be no physical effects on landscape/coastal features or elements, and the assessment is therefore primarily concerned with effects on the perception of character, arising from changes occurring at a distance. The assessment is informed by the ZTV maps (Figures 14.2 (Volume 3) and 14.3 (Volume 3)), and by the visualisations of the Offshore Wind Farm (Figures 14.18 (Volume 3) to 14.43 (Volume 3)).
72. Maintenance activities will require regular vessel movements to and from the Wind Farm Area. This vessel activity will not result in landscape and visual effects. Increased vessel movements at the O&M port / harbour may have some effects. At present, the location of the O&M port / harbour, and the extent of vessel movements, is undetermined. The increases in vessel movements would be seen in the context of existing port/harbour activity and wider marine activity in the outer Firth and Tay, and no significant effects are predicted.
73. Operational effects will continue for the lifetime of the Offshore Wind Farm. Operational effects are therefore long term and fully reversible.

### 14.8.2.1 Impacts of the Offshore Wind Farm on Coastal Character

74. The SLVIA has identified significant (moderate) effects on the following three regional seascape units (see Figure 14.4 (Volume 3)):
- SA12: St Andrews to Fife Ness;
  - SA13: East Neuk of Fife; and
  - SA17: Eyebroughy to Torness.
75. These areas are the closest to the Wind Farm Area, and have a generally open outlook towards the turbines. The Offshore Wind Farm may impact on the characteristic relationships between these coasts, the sea, and the islands in the Forth. The presence of the turbines, as well as the aviation and navigation lighting at night, will affect perception of these areas as relatively wild coasts that are generally undeveloped. Effects on all other regional seascape units are assessed as minor or negligible, due to greater distance from the Offshore Wind Farm and/or greater levels of human influence, that limit the additional influence of the turbines.
76. At night, turbine lighting will alter the character of darker coastal landscapes, and will give rise to moderate (significant) effects on coastal character in eastern Fife (SA12 and SA13). Effects on other coastal landscapes will not be significant.
77. The detailed assessment is set out in Appendix 14.1, and summarised in Table 14.16.

Table 14.16: Impacts on Regional Seascape Units

Regional Seascape Unit	Sensitivity	Magnitude of impact	Significance of effect
SA4: Montrose	High	Very low	Negligible
SA5: Long Craig	Medium	Very low	Negligible

Regional Seascape Unit	Sensitivity	Magnitude of impact	Significance of effect
SA6: Lunan Bay	High	Very low	Negligible
SA7: Lang Craig to the Deil's Head	High	Low	Minor
SA8: Arbroath to Monifieth	Medium	Low	Minor
SA9: Dundee	Low	Very low	Negligible
SA10: Inner Firth of Tay	Low	Very low	Negligible
SA11: St Andrews Bay	High	Low	Minor
SA12: St Andrews to Fife Ness	High	Medium	<b>Moderate</b>
SA13: East Neuk of Fife	High	Medium	<b>Moderate</b>
SA14: Kirkcaldy and Largo Bay	Medium	Very low	Negligible
SA16: Edinburgh to Gullane	Medium	Very low	Negligible
SA17: Eyebroughy to Torness Point	Medium	Medium	<b>Moderate</b>
SA18: Torness Point to St Abb's Head	Medium	Low	Minor
SA19: St Abb's Head to Eyemouth	High	Low	Minor
SA20: Eyemouth to Berwick upon Tweed	Medium	Very low	Negligible

#### 14.8.2.2 Impacts of the Offshore Wind Farm on Landscape Character

- 78. The SLVIA has identified no significant impacts on (non-coastal) landscape character. Effects on four landscape character types were assessed as minor (not significant), restricted to areas of Fife and East Lothian that have a strong coastal element (see Figure 14.5 (Volume 3)). Effects on all other areas were assessed as negligible (not significant). This reflects the limited effect of the offshore development on the character of inland areas.
- 79. At night, turbine lighting is not predicted to have significant effects on any inland landscape character types.
- 80. The detailed assessment is set out in Appendix 14.1, and is summarised in Table 14.17.

Table 14.17: Impacts on Landscape Character Types

Landscape Character Type	Sensitivity	Magnitude of impact	Significance of effect
Coastal Hills Headlands Plateaux and Moorlands	Medium	Low	Minor
Coastal Margins	Medium	Low	Minor
Coastal Raised Beaches and Terraces	High	Very low	Negligible
Dipslope Farmland	Medium	Very low	Negligible
Fife Lowland Farmland	Medium	Low	Minor
Foothills	Medium	Very low	Negligible

Landscape Character Type	Sensitivity	Magnitude of impact	Significance of effect
Low Coastal Farmlands	Medium	Low	Minor
Lowland Coastal Flats Sands and Dunes	High	Very low	Negligible
Lowland Hills (South)	Low	Very low	Negligible
Lowland Plains	Low	Very low	Negligible
Lowland River Valleys	Low	Very low	Negligible
Narrow Wooded River Valleys	Low	Very low	Negligible
Pronounced Hills	Low	Very low	Negligible
Upland Fringe Moorland and Grassland: the Lammermuir, Pentland and Moorfoot Hills	Medium	Very low	Negligible
Upland Hills: the Lammermuir, Pentland and Moorfoot Hills	Medium	Very low	Negligible

#### 14.8.2.3 Implications for Landscape Designations

81. The SLVIA concluded that significant effects on coastal character will only occur along sections of the Fife and East Lothian coasts, with lesser effects in other coastal areas and inland. Since effects on coastal and landscape character are already assessed, landscape designations are not assessed as discrete receptors since this would lead to double counting of effects.
82. Instead, the special qualities of each landscape designation were evaluated against the findings of the coastal and landscape impact assessment, to determine whether the designated area would be adversely affected by the Offshore Wind Farm.
83. The assessment concludes that, for most of the areas examined, there will be some effect on one or two identified qualities or reasons for designation, but in each case there are several other reasons for designation that will not be affected. The historic character of GDLs in particular was not judged to be affected at any site. The assessment of GDLs is summarised in Table 14.18.
84. Qualities of local landscape designations relating to open marine views and wildness are most likely to be affected where coastal character effects have been identified, namely along the eastern coasts of Fife and the northeast coast of East Lothian. The assessment of local landscape designations is set out in Table 14.19.
85. The detailed assessment is provided in Appendix 14.1.

Table 14.18: Implications for Gardens and Designed Landscapes

GDL Name	Implications for special qualities
St Andrews Links	The coastal setting of the links is considered important, and views of offshore turbines may affect the open character of the site to some extent. The historic importance of the site is unlikely to be affected.
Cambo	Effects are unlikely within the wooded core area. From peripheral areas such as the golf course, the turbines will be clearly visible in the middle distance (19 km), and significant effects on views may be anticipated.

GDL Name	Implications for special qualities
Grey Walls	Glimpsed views of the Offshore Wind Farm from peripheral areas will not affect the character of the designation.
Leuchie	Views to northeast toward the Offshore Wind Farm would only be glimpsed from peripheral locations, with no effect on historic character.
Tynninghame	The presence of the offshore turbines may affect the character of coastal parts of the GDL, but will not be experienced in the central parkland, which is screened by woodland.
Biel	Views of the turbines would only be perceived from peripheral areas of the policies, where they would not affect the character of the GDL.
Broxmouth Park	There is an axial view along the Brox Burn towards the Isle of May, in which the Offshore Wind Farm may be visible in oblique views. Views of the turbines are likely from peripheral areas of the policies, but the historic character of the GDL will not be affected.
Dunglass	The northern coastal flank of the designed landscape has open sea views over the A1 and Torness Power Station, which would include the Offshore Wind Farm. The turbines would be a relatively distant feature in the view, and are unlikely to result in changes to the historic character of the GDL.

Table 14.19: Implications for Local Landscape Designations

Local landscape designation name	Implications for special qualities
<b>Aberdeenshire Special Landscape Areas</b>	
South East Aberdeenshire Coast SLA	Minimal effect on two ‘qualifying interests’ of the designation.
<b>Fife Local Landscape Areas</b>	
Tentsmuir Coast LLA	Some effect on perception of remoteness, but other qualities unaffected.
St Andrews Links LLA	The Offshore Wind Farm will have some effect on the open seaward views, but will not affect other identified qualities.
St Andrews to Fife Ness LLA	Significant effects on coastal character predicted in this area, and effects on characteristic seaward views, but not on other identified qualities, including historic environment and recreational value.
East Neuk LLA	Significant effects on coastal character and seaward views predicted in this area, but other identified qualities of the LLA, such as traditional villages and policy landscapes, will not be affected.
Forth Islands LLA	Significant effects on coastal character and seaward views predicted in this area, but the Isle of May will retain its scenic, heritage and nature conservation value.
<b>East Lothian Special Landscape Areas</b>	
Port Seton to North Berwick Coast SLA	Some effect on coastal character in part of this SLA, arising from distant views of the Offshore Wind Farm, with some implications for particular views. However, the Project will not affect the overall scenic quality of the SLA, particularly as it will not be visible across much of the SLA.

Local landscape designation name	Implications for special qualities
North Berwick Law SLA	The Offshore Wind Farm will be visible from the summit, including in views of the Bass Rock, and significant effects on visual amenity are predicted. The Project will not affect the setting of this landmark, or its relationship with the wider East Lothian landscape.
Tantallon Coast SLA	In clear weather, the turbines will be an unavoidable presence in views from this coastline, and significant effects on landscape character and visual amenity are predicted. At night, lighting on the turbines will also be visible, affecting the lack of lighting that contributes to wildness. The many other scenic, recreational cultural and natural qualities of this SLA will be unaffected.
Belhaven Bay SLA	On days when visibility is suitable, the Offshore Wind Farm will be an unavoidable presence in seaward views. At night, lighting on the turbines will also be visible, affecting the experience of wildness. The many other scenic, recreational cultural and natural qualities of this SLA will be unaffected.
Dunbar to Barns Ness Coast SLA	Significant effects on landscape character and visual amenity are predicted along this coast as a result, which will impact on some of the qualities of the SLA associated with offshore views. Other qualities of the SLA, such as the rugged landform and the fossil beach, will be unaffected.
Thorntonloch to Dunglass Coast SLA	Effects on this coastal character area are not anticipated to be significant. Although views from the coast may be affected, other qualities of the SLA, including the setting of Torness Power Station, will be unaffected.
Scottish Borders Special Landscape Areas	
Berwickshire Coast SLA	There will be some effects on the local experience of wildness but other qualities of the SLA, such as the attractive rocky scenery, will be unaffected and the reasons for designation will not be undermined.

#### 14.8.2.4 Viewpoint Assessment

86. In the viewpoint assessment, summarised in Table 14.20, significant impacts on viewers have been predicted at viewpoints located at up to 35 km from the Offshore Wind Farm. Significant effects at this distance would be restricted to high-sensitivity viewers at the coastal edge. The most distant significant effects are identified where the Offshore Wind Farm would be seen in the context of existing focal points in the view, such as inshore islands and the Bass Rock as perceived from East Lothian.
87. Effects judged major are predicted at viewpoints up to 22 km from the Offshore Wind Farm. Again, these effects would be anticipated for high-sensitivity receptors along the north and south coasts of eastern Fife. Other significant effects are graded moderate.
88. These distances are greater than those at which significant impacts would normally be expected to occur as a result of an onshore wind farm. This is because of the lack of intervening landform and vegetation, which would screen many views of an onshore wind farm. It also reflects the unusual appearance of large vertical structures in the marine environment, where manmade structures are an unexpected element in the view.
89. Views from inland locations have not generally been judged as significant, due to the greater variety of views available over land. The simplicity of views over sea is therefore more vulnerable to changes as a result of the introduction of offshore turbines.

90. The assessment of night-time impacts considered a more limited set of viewpoints, and the findings are summarised in Table 14.21. This suggests that a similar extent of effects is anticipated, with significant effects on views from high-sensitivity coastal locations at up to 30 km. Beyond this distance, lights will become increasingly distant point sources, and are not predicted to be particularly noticeable features. Night time views are anticipated to be experienced by sensitive receptors most commonly during the hours of dusk, when the lighter sky will render the lights less prominent. Their prominence is likely to increase in the hours of full darkness, though fewer receptors will be present to experience this effect. As distant point sources, the lights will not cause sky glow or affect dark sky activities such as stargazing.
91. The detailed assessment of day time and night-time effects is presented in Annex 3 to Appendix 14.1.
92. Effects on viewpoints listed in Table 14.13 have not been assessed in detail. Wirelines in Figures 14.52 (Volume 3) to 14.57 (Volume 3) illustrate the appearance of the Offshore Wind Farm from these locations. They confirm the general conclusions set out above that at coastal locations with open views effects are more likely to be significant, for example Fast Castle (Figure 14.57 (Volume 3)), where effects are likely to be similar to nearby St Abb’s Head (VP 21, moderate and significant). In views from inland locations, the turbines are more distant features. For example, in the views from the B roads in East Lothian (Figures 14.55 (Volume 3) and 14.56 (Volume 3)), the Offshore Wind Farm forms a relatively small element in the view, and will be further screened by woodland in the foreground.

Table 14.20: Effects at Representative Viewpoints

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of impact	Level of effect
2	Beach Road, Kirkton, St Cyrus	49.0	High	Very low	Negligible
5	Dodd Hill	43.9	Medium	Very low	Negligible
6	Braehead of Lunan	39.0	High	Low	Minor
7	Arbroath Signal Tower	30.8	High	Medium	<b>Moderate</b>
8	Carnoustie	31.7	High	Medium	<b>Moderate</b>
9	Dundee Law	44.9	Medium	Very low	Negligible
10	Tentsmuir	31.8	High	Medium	<b>Moderate</b>
11	Strathkinness	33.1	High	Low	Minor
12	St Andrews, East Scores	28.2	High	Medium	<b>Moderate</b>
13	Fife Ness, Lochaber Rock	15.5	High	High	<b>Major</b>
14	Anstruther Easter	21.8	High	High	<b>Major</b>
15	Largo Law	36.8	Medium	Low	Minor
16	Isle of May	16.3	High	High	<b>Major</b>
17	North Berwick Law	33.0	High	Medium	<b>Moderate</b>
18	Dunbar	28.0	High	Medium	<b>Moderate</b>

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of impact	Level of effect
19	Innerwick	30.4	High	Medium	Moderate
20	Coldingham Moor	32.8	Medium	Low	Minor
21	St Abb's Head	33.0	High	Medium	Moderate
22	St Andrews, West Sands	29.9	High	Medium	Moderate
23	Crail	18.4	High	High	Major
24	Scottish Seabird Centre, North Berwick	32.4	High	Medium	Moderate
25	Tantallon Castle	29.3	High	Medium	Moderate
26	Broad Sands, North Berwick	34.9	High	Medium	Moderate
27	A198, North Berwick	30.2	High	Medium	Moderate
28	A199, East Linton	36.1	Medium	Low	Minor
29	Hopetoun Monument	42.0	High	Low	Minor

Table 14.21: Effects at Representative Night Time Viewpoints

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of impact	Level of effect
N1	King's Road, Arbroath	30.1	High	Low	Minor
N2	Carmyllie	38.4	Medium	Low	Minor
N3	East Haven	31.7	High	Low	Minor
N4	St Andrews, East Scores	28.2	High	Medium	Moderate
N5	Crail	18.4	High	Medium	Moderate
N6	Scottish Seabird Centre, North Berwick	32.4	High	Low	Minor
N7	Dunbar	28.0	High	Medium	Moderate
N8	A199, East Linton	36.1	Medium	Low	Minor

#### 14.8.2.5 Impacts of the Offshore Wind Farm on Visual Amenity

93. The following sections provide some interpretation of the viewpoint assessment, in terms of the predicted effects on visual amenity across the study area, as likely to be experienced by the visual receptors identified at 14.6.2.2.

##### 14.8.2.5.1 Settlements

94. Based on the findings of the viewpoint assessment, major effects may be anticipated for sensitive receptors in coastal settlements within 22 km of the Offshore Wind Farm. This includes the East Neuk villages of Craig (VP 23), Anstruther (VP 14) and Pittenweem, as well as smaller settlements in the eastern most part of Fife. Major (significant) effects will only occur where the Offshore Wind Farm is clearly visible from locations with an existing open sea view. In the densely clustered East Neuk villages, this is likely to be limited to houses and harbour side locations along the sea front, as well as some properties higher up on the raised beach.
95. Coastal settlements between 22 and 35 km, where up to moderate (significant) effects may be anticipated, include Arbroath Signal Tower (VP 7), Carnoustie (VP 8), St Andrews (VP 12), St Monans, North Berwick (VP 24), Dunbar (VP 18), and Cockburnspath. Again, moderate effects will only be experienced by high sensitivity receptors who currently have unobstructed open sea views.
96. Viewers looking out from closer settlements at night may experience significant effects as a result of visible aviation and navigation lighting on the turbines. This is most likely to be a significant effect in smaller settlements with fewer existing light sources.
97. No significant effects are predicted at more distant settlements or properties, or at non-coastal settlements, though minor effects may occur.

##### 14.8.2.5.2 Recreational Receptors

98. Coastal recreational destinations within 22 km of the Offshore Wind Farm, where major (significant) effects may be anticipated, include the whole of the Isle of May, the 20-minute ferry crossing from Anstruther, Cambo Gardens and a number of golf courses and caravan parks along the Fife coast.
99. Open coastal locations within 35 km, where moderate (significant) effects may be anticipated, include cliff top sites such as Tantallon Castle (VP 25), Fast Castle and St Abb's Head (VP 21), and beaches at Pease Bay, Tentsmuir (VP 10) and Carnoustie (VP 8).
100. Recreational boat users within the outer Firth of Forth and Firth of Tay will view the Offshore Wind Farm at relatively close ranges, depending on their course. Boat users may view the turbines for prolonged periods. Up to major (significant) effects are predicted.
101. Recreational use outside of settlements is less likely to be taking place during the hours of darkness, though there will be receptors at caravan parks and coastal campsites, for example. Night views of the flashing aviation and navigation lights on the turbines will reduce the experience of relative remoteness that may be associated with such sites. Where these higher sensitivity receptors view the turbine lighting from dark coastlines within 30 km of the Offshore Wind Farm, effects may be up to moderate (significant).

##### 14.8.2.5.3 Recreational Receptors on Routes

###### Walkers

102. Walkers following the Fife Coastal Path from the south will have more or less continuous views of the Offshore Wind Farm for around 20 km of the route along the East Neuk Coast from Earlsferry to Fife Ness (passing VP 14, VP 23 and VP 13). Similarly, walkers approaching from the north will have more or less continuous views of the turbines between St Andrews (VP 12) and Fife Ness, for around 15.5 km of the route. Views will be locally screened by topography, vegetation and buildings, but the route is often right on the coastal edge. Turbines would be seen in the direction of travel, at distances of 15 to 30 km. Up to major (significant) effects are predicted. Walkers on this route would also see the

turbines from the Tentsmuir area (VP 10), between the Eden estuary and Tayport, at distances of 30 to 35 km.

103. Walkers on the John Muir Way would pass through the ZTV of the Offshore Wind Farm for around 36 km between Eyebroughy and Dunglass. A number of assessment viewpoints are on or close to the route, including VP 18, VP 24 and VP26. Views of the turbines would be generally oblique to the direction of travel, whichever direction is followed. There may be some screening by topography, vegetation and buildings, but the route is often right on the coastal edge. Turbines would be visible at distances of 28 to 35 km. Up to moderate (significant) effects are predicted.
104. None of the other routes included in Scotland's Great Trails are within the ZTV of the Offshore Wind Farm, with the exception of a 2-3 km section of the Southern Upland Way near Cockburnspath, where no significant effects are predicted.
105. Walkers on other coastal footpaths within approximately 35 km of the Offshore Wind Farm, where open views are available towards the turbines, may experience significant effects on views. Walkers using inland footpaths are less likely to experience significant effects on views, for example in views from Largo Law (VP 15).

### Cyclists

106. NCN Route 1 takes in Strathkinness (VP 11), Tentsmuir (VP 10), and follows the Angus coast passing VP 8, VP 7, VP 6 and VP 2. Various sections of the route are within the ZTV of the Offshore Wind Farm, particularly along the Angus coast, where the turbines will be a continuous feature on clear days. Moderate (significant) effects are anticipated over the Tentsmuir and south-east Angus sections of the route, which are within 35 km of the Offshore Wind Farm.
107. NCN Route 76 follows coastal roads between Eyemouth and Dunbar, passing through sections of the ZTV and close to VP 20 and VP 18. The Offshore Wind Farm will be seen in oblique views from around 20 km of the route, which is within 35 km and moderate (significant) effects may therefore be anticipated.
108. None of these recreational routes are likely to see substantial use during the hours of darkness, and no significant night-time effects are therefore predicted for this receptor group.

#### 14.8.2.5.4 Other Travelling Receptors

### Rail Routes

109. The East Coast Mail Line (ECML) railway follows the coastal edge between Cockburnspath and Dunbar. Over this stretch (around 15 km), there would be open views out to the Offshore Wind Farm, at around 28 to 30 km distance. Trains on this stretch are all high-speed long distance services, and sensitivity is low. Significant effects are not predicted.

### Roads and Tourist Drives

110. The route of the A1 closely follows that of the ECML. People travelling in either direction would have oblique views of the Offshore Wind Farm from the 15 km section between Cockburnspath and Dunbar. Due to the high speed of travel, sensitivity is judged to be low. Significant effects are not predicted.
111. The East Lothian Coastal Trail/Scotland's Golf Coast Road (A198) is largely within the ZTV between Gullane and the A1, though actual visibility would be reduced by vegetation and other features. The turbines would be seen at 30 km or more, sometimes in open elevated views. VP 27 is on this road, east of North Berwick, and shows how the Offshore Wind Farm may be seen alongside the Bass Rock. As the viewer travels along the A198 the relationship of the Offshore Wind Farm, the Bass Rock and other features will change. The turbines will introduce a new focal feature of different form to the existing focal points of the Forth islands, with moderate (significant) effects on the most sensitive receptors.

112. The Fife Coastal Tourist Route includes the A917, which follows the East Neuk coast between Elie and St Andrews, and is generally within the ZTV. Although there is some roadside screening of views by vegetation and buildings, road users would see the Offshore Wind Farm in the direction of travel, at distances of 15 to 30 km. There would also be more limited or distant views from sections of the A955 and A914. Up to moderate (significant) effects are predicted.
113. The Angus Tourist Route mainly follows the A92, which often runs close to the coast and passes VP 7. Where the route is within the ZTV, views of the Offshore Wind Farm would be oblique or perpendicular to the direction of travel, at distances of up to 30 km. Up to minor (not significant) effects are predicted.
114. By night, the attention of road and rail users is less likely to be focused on the view, and the turbine lights are more likely to be viewed as a passing feature of interest rather than as an intrusion in views (e.g. VP N8). Significant effects are not anticipated.

### Ferry Routes and Cruise Ships

115. For visitors accessing the Isle of May via boat trips from Anstruther harbour, the Offshore Wind Farm will be clearly visible at between 15 and 22 km to the east, over the whole course of this 20-minute trip. Major (significant) effects are predicted. It is also possible to visit the Isle of May from North Berwick. Over the course of the 30-minute outward trip, the Offshore Wind Farm will increase in visibility. From North Berwick (VP 24) the turbines will be a distant feature, partly behind the horizon. Heading northeast, more of the turbines will be revealed, and the Offshore Wind Farm will be continuously in view. Major (significant) effects are predicted. The island and the boat trips are not accessible at night.
116. Cruise ships entering and leaving the Firth of Forth may pass relatively close to the Offshore Wind Farm, depending on their precise route. Passengers may view the turbines as a feature of interest as they pass by, and would see the Offshore Wind Farm for a short period of their voyage. The presence of the turbines is unlikely to affect the overall experience of entering the Forth. Significant effects are not predicted.

### 14.8.3 Decommissioning Phase Impacts

117. Impacts from decommissioning are anticipated to be similar to those assessed during construction, as turbines are removed from the Wind Farm Area at the end of the Project's operational life. Effects on landscape and visual receptors resulting from decommissioning activities would be expected to be similar to those described during the construction phase.
118. Towards the end of the operational life of the Project, all decommissioning options will be considered. 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.

### 14.8.4 Cumulative Impacts

119. Cumulative effects refer to effects upon receptors arising from the Project when considered alongside other proposed developments and activities and any other reasonably foreseeable projects and 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.
120. The aim of the cumulative SLVIA is to describe the ways in which the Project "would have additional impacts when considered together with other existing, consented or proposed windfarms" (SNH, 2012, paragraph 55). The cumulative assessment therefore focuses on the *additional* cumulative change which may result from the introduction of the Project. A cumulative assessment may also consider the potential interactions between different types of development (e.g. transmission

infrastructure, other energy generation stations or other built development) if these are likely to result in similar landscape and visual impacts.

#### 14.8.4.1 Cumulative Baseline

121. Projects and activities considered within the cumulative impact assessment are set out in Table 14.22. 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.
122. In assessing the cumulative impacts for the Project, the proposed Inch Cape and Seagreen projects as detailed in the Scoping Reports submitted to MS-LOT (ICOL, 2017; Seagreen, 2017) are considered to represent the 'worst case' (rather than the consented projects) in light of the proposed use of fewer but larger turbines. Design envelope information on these scoping proposals was exchanged by the developers, and they have been included in modelling and are discussed in the assessments.
123. Based on consideration of this assessment and the Original ES, it is judged that consideration of the consented Inch Cape and Seagreen projects as a further scenario would not lead to any different findings in relation to cumulative effects, as compared to the consideration of the scoping Inch Cape and Seagreen projects.
124. Other offshore wind farms in the area are included in Table 14.22, as are a selection of onshore wind farms, as set out in Appendix 14.1.

Table 14.22: Projects included in the cumulative SLVIA

Development Type	Project	Status	Data Confidence Assessment
Offshore Wind Farm	Inch Cape Offshore Wind Farm	Proposed	High: scoping opinion issued. Project information provided by Developer.
Offshore Wind Farm	Seagreen Phase I	Proposed	High: scoping opinion issued. Project information provided by Developer. <sup>3</sup>
Offshore Wind Farm	Forthwind Demonstration Array	Consented	High: two turbines consented. Published project information available in the public domain.
Offshore Wind Farm	Forthwind Demonstration Array Extension	Proposed	High: scoping opinion requested. Published project information available in the public domain.
Offshore Wind Farm	Kincardine Offshore Wind Farm	Consented	High. Published project information available in the public domain.
Onshore Wind Farms	Various (see Appendix 14.1)	Operational and consented	High. Published project information available in the public domain.
Onshore Wind Farms	Various (see Appendix 14.1)	Proposed	High. Published project information available in the public domain.

125. Cumulative ZTVs have been generated to illustrate the theoretical extent of visual interactions between the Project and the selected offshore and onshore wind farms, grouped by broad geographical areas. These show the number of wind farms theoretically visible from across various parts of the study area. Cumulative ZTVs are included in Figures 14.9 (Volume 3) to 14.17 (Volume 3),

<sup>3</sup> No layout information was initially provided for Seagreen Phase I, and ZTVs and visualisations are therefore based on an indicative layout devised by LUC, based on parameters supplied by Seagreen. Information subsequently received was not judged to make a material difference to ZTVs and visualisations, or to the assessments.

and discussed in detail in Appendix 14.1. The proposed Inch Cape and Seagreen offshore wind farms are illustrated in the visualisations in Figures 14.18 (Volume 3) to 14.57 (Volume 3).

126. Since it is considered highly unlikely that any of the other offshore wind farms will be under construction at the same time as the Project, and construction of onshore wind farms is unlikely to give rise to cumulative effects, only operational phase cumulative impacts are assessed.

#### 14.8.4.2 Cumulative Impact Assessment

##### 14.8.4.2.1 Cumulative effects on coastal character

127. Significant cumulative effects on coastal character are predicted to be limited to the eastern tip of Fife Ness, where the nearby presence of the Offshore Wind Farm, in addition to the likely presence of Inch Cape, would affect the perception of character along the coastal edge of two Regional Seascape Units (SA12 St Andrews to Fife Ness and SA13 East Neuk of Fife). The presence of the Offshore Wind Farm with the more distant Seagreen Phase I Project would be less likely to give rise to significant effects due to the separation between the two sites. The Offshore Wind Farm will also contribute to cumulative effects along the Angus coast (SA8 Arbroath to Monifieth), though it will be more distant than Inch Cape. Both Inch Cape and Seagreen Phase I are 50 km or more from the East Lothian Coast, so cumulative effects on character are highly unlikely in this area.
128. No significant cumulative effects on coastal character are predicted to occur as a result of interactions with any of the other projects listed in Table 14.22. ZTVs for other offshore wind farms overlap with that of the Offshore Wind Farm across small areas. With regard to onshore schemes, there are extensive overlaps of visibility, particularly across East Lothian where operational and proposed wind farms on the Lammermuirs are visible. However, none of the onshore wind farms assessed have strong influences on coastal character, with the exception of Drone Hill in the Scottish Borders, and potentially Kenly in Fife. There may be localised cumulative effects in relation to the latter, but Drone Hill is more distant. No significant cumulative effects are predicted.

##### 14.8.4.2.2 Cumulative effects on landscape character

129. The landscape impact assessment has not identified any significant impacts upon landscape character areas from the Project. Due to its offshore location, there is no potential for the presence of the Offshore Wind Farm to transform any LCT into a 'wind farm landscape'. Given the low magnitude of impact identified in the stand-alone assessment, and the limited potential for offshore development to give rise to cumulative impacts on landward character, it was judged that no significant effects would occur, and therefore no detailed assessment of cumulative effects on onshore landscape character, as represented by LCTs, has been undertaken.
130. There is an increasing number of single turbines or small clusters of turbines of varying size across the landscape of the study area, which has had some effect on landscape character in places. The additional presence of the Offshore Wind Farm is not considered likely to contribute significantly to such effects, due to its different scale, form and marine location.

##### 14.8.4.2.3 Cumulative implications for landscape designations

131. The St Andrews to Fife Ness LLA and East Neuk LLA cover areas that, as noted above, are likely to experience significant cumulative effects on coastal character as a result of views of the Offshore Wind Farm and Inch Cape. This will lead to further effects on qualities related to outlook and remoteness, but will not further affect any of the other qualities for which the areas are designated. There may be more limited effects on the Tentsmuir LLA and St Andrews Links LLA.

##### 14.8.4.2.4 Cumulative effects on visual amenity

132. Significant cumulative effects have been predicted for high-sensitivity viewers at several representative viewpoint locations. These are all located on the Fife coast, in locations where the Offshore Wind Farm will be clearly visible alongside the proposed Inch Cape Offshore Wind Farm. The

combined views of both offshore wind farms from these locations will result in a large sector of the seaward view being occupied by wind turbines. Similar effects would be anticipated if the consented Inch Cape scheme were present in place of the proposed scheme. This combination will not give rise to cumulative effects on views from East Lothian due to the greater distance of Inch Cape. Cumulative impacts arising from the combination of the Offshore Wind Farm and Seagreen Phase I are not anticipated to be significant, again due to the greater distance of the latter from shore.

133. The Forthwind turbines will be visible in successive views from locations in Fife and East Lothian, but the distances between them, and the developed coastal backdrop that these turbines are seen against, will reduce the potential for cumulative effects. There are very few locations where both the Offshore Wind Farm and the Kincardine Offshore turbines will be seen together, and any resulting effects will not be significant.
134. When considering onshore turbines, there are no coastal wind farms or proposals that are likely to be seen in combined views of the Offshore Wind Farm, with the exception of the consented Kenly Wind Farm in Fife that may be seen in more distant views from north and south, as well as local successive views. Other operational and consented wind farms are set back from the coast, in upland areas such as the Lammermuirs and Sidlaw Hills. Compared with the Offshore Wind Farm, they have distinctly different appearance and context in views, and significant cumulative effects are not anticipated.
135. At night, significant cumulative effects are predicted where aviation and/or navigation lights of more than one offshore wind farm are visible at relatively close range, and where the Offshore Wind Farm being closer is likely to have a greater additional effect. This is anticipated for high sensitivity receptors along the areas along the northeast Fife coast, including people in St Andrews and coastal settlements, campsites and caravan parks.
136. Onshore wind farms do not, generally, include lighting. Future proposals for larger turbines in the Lammermuirs may require lighting, but this will be distant from the Offshore Wind Farm, and cumulative effects are not anticipated.
137. Cumulative effects predicted at representative viewpoints are presented in Table 14.23, and at representative night-time viewpoints in Table 14.24.

Table 14.23 Cumulative Effects at Representative Viewpoints

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of cumulative impact	Level of cumulative effect
2	Beach Road, Kirkton, St Cyrus	49.0	High	Low	Minor
5	Dodd Hill	43.9	Medium	Low	Minor
6	Braehead of Lunan	39.0	High	Low	Minor
7	Arbroath Signal Tower	30.8	High	Low	Minor
8	Carnoustie	31.7	High	Low	Minor
9	Dundee Law	44.9	Medium	Very low	Negligible
10	Tentsmuir	31.8	High	Medium	<b>Moderate</b>
11	Strathkinness	33.1	High	Low	Minor
12	St Andrews, East Scores	28.2	High	Medium	<b>Moderate</b>

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of cumulative impact	Level of cumulative effect
13	Fife Ness, Lochaber Rock	15.5	High	High	Major
14	Anstruther Easter	21.8	High	Medium	Moderate
15	Largo Law	36.8	Medium	Low	Minor
16	Isle of May	16.3	High	High	Major
17	North Berwick Law	33.0	High	Low	Minor
18	Dunbar	28.0	High	Low	Minor
19	Innerwick	30.4	High	Low	Minor
20	Coldingham Moor	32.8	Medium	Low	Minor
21	St Abb's Head	33.0	High	Low	Minor
22	St Andrews, West Sands	29.9	High	Medium	Moderate
23	Crail	18.4	High	Medium	Moderate
24	Scottish Seabird Centre, North Berwick	32.4	High	Low	Minor
25	Tantallon Castle	29.3	High	Low	Minor
26	Broad Sands, North Berwick	34.9	High	Low	Minor
27	A198, North Berwick	30.2	High	Low	Minor
28	A199, East Linton	36.1	Medium	Low	Minor
29	Hopetoun Monument	42.0	High	Low	Minor

Table 14.24 Cumulative Effects at Representative Night Time Viewpoints

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of impact	Level of effect
N1	King's Road, Arbroath	30.1	High	Low	Minor
N2	Carmyllie	38.4	Medium	Low	Minor
N3	East Haven	31.7	High	Low	Minor
N4	St Andrews, East Scores	28.2	High	Medium	Moderate
N5	Crail	18.4	High	Low	Minor

No.	Viewpoint	Distance from Wind Farm Area (km)	Sensitivity	Magnitude of impact	Level of effect
N6	North Berwick Seabird Centre	32.4	High	Low	Minor
N7	Dunbar	28.0	High	Very low	Negligible
N8	A199, East Linton	36.1	Medium	Very low	Negligible

#### 14.8.4.2.5 Sequential effects

138. Users of routes in East Lothian, including the coastal tourist route and John Muir Way, will have views of the Offshore Wind Farm, followed by views of the Forthwind turbines seen against a backdrop of development in Fife. Significant effects are not anticipated. Users of the Fife Coastal Tourist Route and Fife Coastal Path will have close views of the Forthwind turbines seen against the view to the Bass Rock and the outer Firth, followed by views towards the Offshore Wind Farm. Rounding Fife Ness, Inch Cape and Seagreen will be seen in sequence. Cumulative effects on views are predicted to be up to major (significant) for walkers on the Fife Coastal Path, and moderate (significant) for road users. Users of the Angus Tourist Route travelling north or south will have combined but oblique views of the Project and Inch Cape, and more distant Seagreen. Continuing on this route, Kincardine Offshore Wind Farm will also be seen, though separated from the Project by some distance. Significant cumulative effects are not anticipated.

#### 14.8.5 Inter-relationships

139. Effects on visual amenity are related to effects on the setting of historic environment features (see Chapter 13: Cultural Heritage). Where significant effects on setting have been identified within 35 km of the Offshore Wind Farm, these may be combined with significant effects on visual amenity experienced by visitors to these sites.

### 14.9 Mitigation and Monitoring

140. The assessment of impacts, both in isolation and cumulatively, on landscape and visual receptors has predicted effects resulting from the presence of the Offshore Wind Farm ranging from negligible to major.

141. It is acknowledged that traditional methods of landscape and visual mitigation, such as screen planting, are ineffective for wind farm development. Mitigation for wind farms is generally limited to the reduction of potential direct effects through detailed siting, and the reduction in adverse aesthetic effects through wind farm design (see Annex 1 to Appendix 14.1).

142. As set out in Section 14.7.1, mitigation of landscape and visual effects relies on post-consent design processes that may help to reduce the levels of the identified effects. For the purposes of this SLVIA, the effects set out in Appendix 14.1, and summarised in this Chapter, are the residual effects of the Project.

### 14.10 Summary of Residual Effects

143. This chapter has assessed the potential effects on landscape and visual receptors of the construction, operation and decommissioning of the Project, both in isolation and cumulatively. Table 14.25 summarises the impact determinations discussed in this chapter and presents the post-mitigation residual significance.

Table 14.25: Summary of predicted impacts of the Project

Potential Impact	Significance of Effect	Mitigation Measures	Residual Significance of Effect
<b>Construction</b>			
Impact of landfall construction activities on landscape receptors at Thorntonloch Beach	Minor	N/A	Minor
Impact of landfall construction activities on visual receptors at Thorntonloch Beach	Minor	N/A	Minor
<b>Operation</b>			
Impact of the Offshore Wind Farm on coastal character	<b>Moderate</b> in east Fife and north-east East Lothian, minor or negligible elsewhere.	None identified.	<b>Moderate</b> in east Fife and north-east East Lothian, minor or negligible elsewhere.
Impact of the Offshore Wind Farm on landscape character	Minor or negligible.	N/A	Minor or negligible.
Impact of the Offshore Wind Farm on visual amenity	Up to <b>major</b> within 22 km, up to <b>moderate</b> within 35 km, no more than minor beyond 35 km.	None identified.	Up to <b>major</b> within 22 km, up to <b>moderate</b> within 35 km, no more than minor beyond 35 km.
Impact of aviation and navigation lighting on coastal character	Up to <b>moderate</b> along the eastern Fife coast, minor or negligible elsewhere.	None identified.	Up to <b>moderate</b> along the eastern Fife coast, minor or negligible elsewhere.
Impact of aviation and navigation lighting on landscape character	Minor or negligible.	N/A	Minor or negligible.
Impact of aviation and navigation lighting on visual amenity	Up to <b>moderate</b> within 30 km, minor or negligible beyond.	None identified.	Up to <b>moderate</b> within 30 km, minor or negligible beyond.
<b>Cumulative Effects</b>			
Cumulative impacts on coastal character arising from the additional presence of the Offshore Wind Farm	<b>Moderate</b> in east Fife and south-east Angus, minor or negligible elsewhere.	N/A	<b>Moderate</b> in east Fife and south-east Angus, minor or negligible elsewhere.
Cumulative impacts on landscape character arising from the additional presence of the Offshore Wind Farm	None.	N/A	None.
Cumulative impacts on visual amenity arising from views of the Offshore Wind Farm in addition to other wind farms	Up to <b>major</b> where both Neart na Gaoithe and Inch Cape viewed at closer range. Minor or negligible elsewhere.	N/A	Up to <b>major</b> where both Neart na Gaoithe and Inch Cape viewed at closer range. Minor or negligible elsewhere.

## 14.11 References

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