Channel Energy Limited

Atlantic Array Offshore Wind Farm

Environmental Statement

Non-Technical Summary

June 2013

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Channel Energy Ltd (CEL) have been awarded EU TEN-E funding to support the development of the Atlantic Array Offshore Wind Farm located in UK territorial waters. The funding will be used to support desktop and onsite environmental impact assessment studies for the project. The studies will form part of the formal documentation that will accompany the Development Consent Order which CEL is required to submit to the Planning Inspectorate. The sum of €1,096,076 has been granted and the process to reclaim this funding is ongoing.
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Glossary

AGLV – Area of Great Landscape Value, a local designation identifying valued landscapes.

AONB – Areas of Outstanding Natural Beauty are nationally designated landscapes, originally designated under the 1949 National Parks and Access to the Countryside Act and now protected further under The Countryside and Rights of Way (CROW) Act 2000.

BCZL – Bristol Channel Zone Ltd, a wholly owned subsidiary of RWE npower renewables (RWE NRL).

CEL – Channel Energy Limited. A wholly owned subsidiary of BCZL and the company developing the Atlantic Array project.

CEMP – Construction Environmental Management Plan

CoCP – Code of Construction Practice.

DCO – Development Consent Order is the permission required for Nationally Significant Infrastructure Projects.

EEZ – Exclusive Economic Zone; an area over which a state has special rights over the exploration and use of marine resources, including the production of energy from the wind.

EIA – Environmental Impact Assessment is a means of identifying a project’s likely significant environmental effects.

ES – Environmental Statement, a report that sets out the findings of the Environmental Impact Assessment.

GVA – Gross Value Added. A measure in economics of the value of goods and services produced in an area, industry or sector of an economy.

HDD - Horizontal Directional Drilling is a construction method that involves drilling under obstructions, such as roads or rivers to avoid the use of open trenches.

HRA – Habitat Regulation Assessment required to determine likely significant effects of a development on European designated sites, including SACs and SPAs.

ICNIRP – International Commission on Non-Ionizing Radiation Protection.

IPC – Infrastructure Planning Commission.

Landfall – Where the offshore export cables come ashore.

MCZ - Marine Conservation Zone, a Marine Protected Area designated under the Marine and Coastal Access Act 2009.

MW – Megawatt, unit of measurement used to describe the power generated by wind turbines. A megawatt is equal to 1,000,000 watts.

NGET – National Grid Electricity Transmission.

NM – Nautical Miles (1 nm is equivalent to 1.852 km).

NPS – National Policy Statement.

NSIP – Nationally Significant Infrastructure Projects are large projects which support the economy and vital public services. They are defined under Part 3 of the Planning Act 2008.

NTS – Non-Technical Summary.

PEI – Preliminary Environmental Information, information provided as part of the public consultation process outlining the findings of the EIA process to date. PEI is required under the Planning Act 2008 and defined under the Infrastructure

Planning Inspectorate – the independent body that examines applications for NSIPs and makes recommendations on the application to the appropriate Secretary of State.

RWE NRL – RWE npower renewables.

SAC – Special Area of Conservation, a site designated for its ecological value under the European Habitats Directive.

Scour - Erosion of soft surface sediments which can occur around the base of marine structures as a result of localised currents.

Scour protection - Materials placed around marine structures to prevent formation of scour.

SoCC – Statement of Community Consultation which describes how the project developer proposes to consult with the local community about the project.

SPA – Special Protection Area, a site designated for its value for birds under the European Birds Directive.

SSSI – Site of Special Scientific Interest, a site designated for its biodiversity or geological value at the national level under the Wildlife and Countryside Act 1981 (as amended).

Statutory consultee – those bodies, defined under The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, whom the Planning Inspectorate must inform of NSIPs and consult with them.

Transition chamber – Where the offshore export cables are joined to the onshore cables.

ZTV – Zone of Theoretical Visibility, the area around the proposed development from which it may theoretically be visible.
1 Introduction

1.1 Channel Energy Limited (CEL) is proposing to develop a wind farm of up to 1200 megawatts (MW) of generating capacity within the outer Bristol Channel, known as the Atlantic Array Offshore Wind Farm. For the purposes of this document, the Atlantic Array Offshore Wind Farm is referred to as Atlantic Array.

1.2 Atlantic Array would be located approximately 22 kilometres (km) from the south Wales coast, 15.5 km from the north Devon coast and 13.5 km from Lundy Island, at its closest points.

1.3 Atlantic Array is defined as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008. As such there is a requirement to submit an application for development consent for the wind farm to the Planning Inspectorate.

1.4 This document is the Non-Technical Summary (NTS) of the Environmental Statement (ES) for Atlantic Array.

1.5 This NTS provides information about the project, the studies undertaken and also a summary of effects of the project.

1.6 For more detailed information readers should consult the full ES which is divided into two main volumes, with an additional three volumes of annexes. Volume 1 of the ES (and Annex Volumes 3 and 5) relate to the offshore elements of the project, with Volume 2 (and Annex Volume 4) relating to the onshore components. Details on how to access the full ES are provided below.

The Applicant

1.7 CEL is a wholly owned subsidiary of Bristol Channel Zone Ltd (BCZL), itself a wholly owned subsidiary of RWE Npower Renewables Limited (RWE NRL).

1.8 RWE NRL is one of the UK’s leading renewable energy developers and operators. The company is committed to developing and operating wind farms, hydroelectric plants and biomass plants to generate sustainable electricity. The company currently operates 21 hydroelectric schemes and 30 wind farms in the UK including three offshore wind farms, Greater Gabbard (in which it holds a 50% share) located 25 km off the coast of Suffolk and North Hoyle and Rhyl Flats, located 7 km and 8 km off the coast of north Wales respectively.

1.9 The company is also currently constructing a large offshore wind farm; Gwynt y Môr, 13 km off the north Wales coast.
Project Overview

1.10 Atlantic Array is a proposed Round 3 offshore wind farm with a planned installed generating capacity of up to 1200 MW. The project comprises both the offshore wind farm and associated offshore and onshore transmission infrastructure.

1.11 The location of the project is shown on Figure 1.1.

1.12 The project comprises the following main components:
- Offshore wind turbines, including associated turbine support structures and foundations;
- Offshore electrical infrastructure (e.g. inter-array cables and offshore platforms for substations) and export cables;
- Offshore meteorological masts and associated foundations;
- A landfall site with associated jointing between the offshore and onshore cable;
- Onshore underground cable route; and
- Onshore substation and connection to the National Grid.

1.13 At this stage in the development process, the electrical output of the turbines to be used (measured in megawatts) and consequently the actual number of turbines and overall generating capacity of Atlantic Array is not fully determined. These factors would be dependent upon the generating capacity of the turbines available at the time of construction. A range of turbines with generating capacity between 8 MW and 5 MW is currently being considered. The maximum number of turbines within the project design envelope ranges from 150 to 240 respectively, with a resulting installed capacity of up to 1200 MW.

1.14 With respect to onshore infrastructure, a grid connection agreement was signed between CEL and National Grid Electricity Transmission (NGET) in 2006. This identified the connection point as the existing Alverdiscott 400 kV substation, approximately 5 km to the south east of Bideford, in the Torridge district of north Devon.

1.15 If the application for development is successful, construction of the onshore infrastructure is anticipated to commence in 2016 and construction of the offshore infrastructure approximately 1 to 2 years later. Works may be undertaken using a phased approach whereby the project is constructed in up to three phases. Further details are given in Section 5.
Purpose of the Environmental Statement

1.16 The ES has been prepared in order to assess the effects of the project on the environment. The scope of the ES includes both the offshore and onshore elements of Atlantic Array. This NTS summarises the likely effects associated with both the onshore and offshore components of Atlantic Array.

1.17 Section 2 of this NTS provides an outline of the consents process, followed by an outline of the approach to Environmental Impact Assessment (EIA) (Section 3) and an overview of the site selection process for the project (Section 4).

1.18 A description of the project is provided in Section 5, followed by an overview of the environmental effects of the offshore elements of the project in Section 6 and of the onshore elements of the project in Section 7. Combined effects are considered in Section 8.

1.19 Consultation regarding the project has been ongoing. Preliminary Environmental Information (PEI) was produced in September 2011 for consultation with the local community under section 47 of the Planning Act 2008. A draft ES was submitted for consultation in June 2012 as part of the formal consultation under section 42 of the Act. Feedback on both the PEI and draft ES has been taken into account and, where appropriate and practicable, has been used to amend and improve the project and the final ES.

1.20 The ES and this NTS accompany the application made to the Planning Inspectorate for development consent for the project. Details of how consultees and members of the public may respond to the application, together with details of how to register as an interested party can be found on the Planning Inspectorate website at:

http://infrastructure.planningportal.gov.uk/
2 Consenting Process

Renewable Energy

Introduction to Round 3

2.1 The Crown Estate owns virtually all of the UK seabed out to 12 nautical miles (nm). Under the Energy Act 2004 (as amended), The Crown Estate is able to licence the generation of renewable energy on the UK continental shelf within the Renewable Energy Zone (REZ), which extends out to a maximum of 200 nm, and as such has been working with the offshore wind energy industry in an ongoing programme of offshore wind development.

2.2 This programme commenced with ‘Round 1’ wind farms, which comprised small offshore wind farm projects of typically less than 100 MW capacity. The Crown Estate’s second round of leasing, Round 2, commenced during 2003. Round 2 projects are generally larger scale and located further from the coast.

2.3 In 2008, following consultation, The Crown Estate identified nine offshore zones around the UK for the third round of offshore wind development (Round 3). The development rights for the nine zones were then offered through a competitive tender process.

2.4 Following this tender process RWE NRL, as BCZL, won the rights to develop a wind farm within the Bristol Channel Zone. CEL is taking the Atlantic Array project forward with The Crown Estate, which is investing as a development partner in Atlantic Array up to the point of consent.

Renewable Energy Policy

2.5 UK energy requirements have traditionally been met by fossil fuels and nuclear energy. The United Kingdom Government has concluded that there is a strong need for offshore wind generation in order to meet international climate change obligations and domestic targets for renewable energy, as well as replacing existing generating capacity reaching the end of its lifespan and ensuring security of supply to minimise reliance on imported energy.

2.6 The 2010 National Renewable Energy Action Plan confirmed the UK’s commitment to source 15% of its energy from renewable sources by 2020. While biomass, hydroelectricity and wave and tidal generation are all considered to have an important role to play, the Action Plan states that offshore wind is a key area for development and will play a key role in meeting the 2020 target.
2.7 The Welsh Government published the policy document ‘Energy Wales: A Low Carbon Transition’ in 2012, setting out commitments to a ‘whole system transition to low carbon energy’ aiming to meet the decarbonisation targets set at EU level, provide energy security and resilience and deliver, through energy markets, affordability and a credible framework for long term investment.

2.8 The UK’s commitment to renewable energy has been embodied in the National Policy Statements (NPS), the requirement for which was set out by the Planning Act 2008.

2.9 More recently, the Government has published the Energy Bill, confirming its commitment to the 2020 renewables target and a commitment to a target for decarbonisation for the electricity sector from 2030. The Energy Bill is expected to receive Royal Assent later in 2013.

2.10 Atlantic Array would contribute up to 1200 MW of new renewable generating capacity, sufficient to provide the approximate annual energy needs of 900,000 homes¹. The development therefore represents a significant contribution towards ambitious European, national and regional renewable energy targets.

### The Planning Act

2.11 Under the legislation in the Planning Act, the development of an offshore wind farm of over 100 MW is classified as a Nationally Significant Infrastructure Project (NSIP) and requires a Development Consent Order (DCO). Applications for development consent are examined by the Planning Inspectorate. Following consideration of the application, the Planning Inspectorate makes a recommendation to the Secretary of State. For offshore wind farm projects, the Secretary of State for Energy and Climate Change makes the final decision on whether or not to grant the DCO for the project. This process replaces the former satellite, surface-based and airborne measurement systems. This enables a calculation to be made to estimate the average annual energy production for the site based on 240 turbines each of rated capacity 5 MW. The energy capture predicted, and hence derived homes equivalent or emissions savings figures may change as further data are gathered. Equivalent homes supplied is based on an annual energy consumption per home of 4700 kWh. This figure is supported by recent domestic electricity consumption data available from The Digest of UK Energy Statistics and household estimates and projections from the UK Statistics Authority.

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¹ Energy predicted to be generated by the project is derived using long term wind speeds calculated by meteorological models seeded with historic weather data obtained from
Infrastructure Planning Commission (IPC) procedure for NSIPs.

2.12 The DCO will replace a number of consents formerly required for a project of this type. The application will provide for the project in its entirety, i.e. both the offshore and the onshore aspects, with electrical grid connection works comprising ‘associated development’ under the new regime. For Atlantic Array, a deemed marine licence will be applied for within the DCO application process for works within English territorial waters, the terms of which will be drafted in discussion with the Marine Management Organisation (MMO). For the part of the project falling within Welsh territorial waters, the authority to issue a marine licence rests with the Welsh Ministers and will be applied for separately. The terms of the licence will be drafted in discussion with the Natural Resources Wales marine licensing team.

2.13 The decision on consenting the project will also be made having regard to any requirements of the UK Marine Policy Statement.

Environmental Impact Assessment

2.14 The legislative framework for EIA is set at the European level by European Directive 2011/92/EU, which codifies Directive 85/337/EEC, as amended. The EIA Directive requires that EIA be undertaken in support of an application for development consent for certain types of project.

2.15 Offshore wind farms are listed in Annex II of the EIA Directive as ‘installations for the harnessing of wind power for energy production (wind farms)’.

2.16 For NSIPs that require development consent under the Planning Act, the requirements of the EIA Directive have been transposed into UK legislation by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009, as amended. Within this document, these are referred to as the ‘EIA Regulations’. The EIA Regulations apply to offshore wind farms of over 100 MW.

2.17 The ES and this NTS have been produced to provide information on the identification and assessment of the likely significant environmental effects of Atlantic Array to accompany the development consent application.
3 Approach to Environmental Assessment

Scoping

3.1 Scoping is the process of identifying the issues to be addressed during the EIA process. A Scoping Report was submitted to the former IPC in April 2010. This set out details of the proposed scope of environmental assessments to be undertaken for both the offshore and the onshore elements of Atlantic Array.

3.2 A Scoping Opinion was issued by the IPC in May 2010, together with the responses received by the IPC from its consultees. Additional responses from the IPC consultees and others were also provided after this date.

3.3 The scoping exercise highlighted a number of areas that consultees wished to see addressed within the EIA. These responses, together with other consultation responses provided throughout the EIA process, have been taken into account in identifying the scope for the EIA. This scope has also been informed by the nature, size and location of the project.

Consultation

3.4 The Planning Act sets out CEL’s duty to undertake formal pre-application consultation on the project with members of the public, those with an interest in the land affected by the project and prescribed statutory bodies. The public are consulted under section 47 of the Act, while statutory bodies are consulted under section 42.

3.5 Statutory consultees have been consulted throughout the development of the project. A series of meetings have been undertaken with key consultees to exchange information and survey results, agree methodologies and receive comments on the approach to EIA as well as the Habitat Regulations Assessment.

3.6 Landowners have also been informally consulted throughout the development process, including completion of a questionnaire in relation to existing land uses.

3.7 With respect to formal community consultation, CEL published its Statement of Community Consultation (SoCC) in July 2011 in local newspapers, setting out the proposed approach to the formal consultation process for the project.

3.8 The consultation process has used a range of communication tools, including the project website

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2 The project website can be visited at: http://www.npower-renewables.com/atlanicarray
newsletters, briefings and comments forms. Public exhibition events were also held across north Devon and south Wales in September 2011 and July 2012.

3.9 A Preliminary Environmental Information (PEI) document, together with a Non-Technical Summary, was produced in September 2011 in support of the duty to consult the local community under section 47 of the Planning Act 2008.

3.10 A draft ES was submitted for consultation in June 2012. This stage included the formal section 42 consultation under the Planning Act. CEL also widened this consultation to include an additional informal round of public consultation supported by a second series of public exhibitions.

3.11 CEL has continued to address the issues raised and comments made throughout the EIA process and in finalising the application. The consultation process is summarised in the Consultation Report which accompanies the DCO application.

Approach to EIA

3.12 The likely effects on the environment which may arise from the construction, operation and decommissioning of Atlantic Array have been assessed in accordance with relevant EIA regulations and guidance.

Baseline Conditions

3.13 The existing and likely future environmental conditions in the absence of the project have been identified. These are known as ‘baseline conditions’. The baseline condition of the site and study area form the basis of the assessment, enabling the likely significant effects of the project to be identified.

Mitigation

3.14 The EIA process is an integral part of the project appraisal and design process. During the EIA process, the likely environmental effects have been considered and these issues have been taken into account within an ongoing design process. The process of EIA has therefore been used as a means of informing and changing the design.

3.15 The project assessed within the ES and for which the development consent application is made therefore includes a range of measures that have been designed to reduce or prevent significant adverse effects arising. In some cases these measures result in enhancement of environmental conditions. The assessment of effects has therefore taken into account all measures that form part of the project and to which CEL is committed.
Assessment of Effects

3.16 The ES sets out an assessment of the likely effects during the construction, operation and decommissioning phases of the project. This is based on consideration of the likely magnitude of the predicted impact and the sensitivity of the affected receptor.

3.17 Significance levels are defined separately for each topic using the terms substantial, major, moderate, minor or negligible.

Cumulative Effects and Inter-Relationships

3.18 The EIA Regulations require consideration of cumulative effects, which are effects on a receptor that may arise when the project is considered together with other proposed developments in the area.

3.19 The approach to the assessment of cumulative effects of Atlantic Array and the list of other development types to be considered as part of the cumulative assessment have been agreed with the local authorities and relevant consultees.

3.20 The EIA Regulations also require consideration of the inter-relationships between topics that may lead to environmental effects. For example, changes in traffic flows may lead to changes in air quality or noise. An overall project assessment has been undertaken that considers the potential inter-relationships, including receptor led effects (multiple effects on a single receptor) and project lifetime effects (effects arising throughout the various phases of the project on a single receptor).

3.21 This assessment also considers any receptors subject to combined effects of the offshore and onshore project elements.
4 Site Selection

4.1 This section outlines the main alternatives considered for the Atlantic Array project. In addition, it sets out the main reasons for the selection of the project elements.

Offshore

4.2 The Atlantic Array site has been subject to ongoing site selection and refinement activities since 2005. The initial investigation into the potential development of a wind farm in the outer Bristol Channel was undertaken by a north Devon based company, Farm Energy. A subsidiary of Farm Energy, Channel Energy Ltd (CEL), undertook a preliminary assessment of the feasibility of an offshore wind farm in the outer Bristol Channel and subsequently secured a grid connection agreement at Alverdiscott. In September 2008, RWE Npower Renewables Limited (RWE NRL) acquired CEL and the development assets for the proposed Atlantic Array offshore wind farm including the grid connection agreement.

4.3 In June 2008, The Crown Estate announced a third round of offshore wind leasing, which included details of eleven zones in waters off the coastlines of England, Scotland and Wales. The indicative development zones identified were subject to an extensive consultation process with key stakeholders including representatives from environmental, commercial fishing, military and shipping interest groups. This process led to a refinement of the tendering round (which became known as ‘Round 3’) to focus on nine zones in a second iteration in September 2008. One of these, Zone 8, was located within the Bristol Channel.

4.4 During 2009, the Department of Energy and Climate Change (DECC) undertook a Strategic Environmental Assessment (SEA) of plans for an additional 25 gigawatts (GW) of offshore wind capacity by 2020 to be developed in UK waters. The spatial area covered by the SEA included territorial waters of England and Wales where the water depth is around 60 m or less, thus including the Round 3 development zones under consideration by the Crown Estate. Following the SEA process, and having regard to the consultation responses received, the UK Government adopted the offshore wind farm plan for an additional 25 GW. Following completion of the SEA by DECC and production of an Appropriate Assessment by the Crown Estate under the Habitat Regulations, the Crown Estate proceeded with the tendering of the Round 3 zones.

4.5 In preparation for the tender round, RWE NRL commenced a programme of surveys to further inform their understanding of the zone, building on the work
undertaken by Farm Energy. The result of this assessment was the selection of a project area for Atlantic Array in the central area of the zone, bounded by deeper water to the west and shipping routes to the east, together with a smaller project in the north east of the zone which it called Atlantic East. Following subsequent consultation and more detailed assessment of constraints, development of this eastern area is no longer being progressed.

4.6 Since award of the development rights for the zone from The Crown Estate in January 2010, the Atlantic Array offshore site boundary has been refined. This follows consultations undertaken with key stakeholders as part of the iterative EIA process and further investigation into the existing environmental and human parameters of the site.

4.7 Although CEL have undertaken the refinement and revision of the project design on an ongoing basis as knowledge of the site has increased, there have been some notable milestones in this process. A series of changes to the project boundary were made before the Preliminary Environmental Information (PEI) was published in support of the community consultation in autumn 2011. These changes were based on avoiding effects on shipping and the Ministry of Defence areas at the north western boundary of the original site.

4.8 Further assessments and the feedback from the community consultation have informed further refinement. This resulted in a significant reduction in the physical area of the project, as well as a substantial reduction in the maximum number of wind turbines being considered, a reduction in the number of offshore electricity export cables and offshore substations and the removal of the eastern cable corridor option.

4.9 The outcome of the changes provided a reduction in the overall extent of the project at the western, northern and north eastern boundaries and reduced the width of the view occupied by the proposed wind farm from viewpoints in south Wales, north Devon and from Lundy. The distance between the Welsh coast and the array was substantially increased; the closest point being the Gower at 22 km (previously 16 km).

4.10 The reduced site extent avoids an area at the north western corner of the array, which had been identified as being used by marine mammal and seabird species as key foraging and feeding grounds, together with any attendant effects on prey species. Other benefits included reduced potential for bird collision risks (through reduction in the number of turbines); decreased areas subject to underwater noise effects; and reduction in areas close to marine dredging or
overlapping with commercial fishing grounds and shipping.

4.11 After consultation on the draft ES with statutory bodies (under Section 42 of the Planning Act), a further series of extensive project reductions were undertaken. The changes included a reduction in both the total project area, the maximum number of turbines being proposed, building upon the alterations made in response to the community consultation of 2011.

4.12 The changes resulted in further reductions in the potential ecological, visual and seascape effects of the project, increasing the separation distance between the project and the coasts of Lundy and north Devon as well as reducing the extent of the view on the horizon. Noise emission durations have significantly decreased along with the area affected by noisy construction activities to minimise effects on fish and marine mammals in the area. The potential for bird collisions has also been further reduced as well as the potential for overlap with fishing grounds and any impact on navigation. In order to accommodate all of these changes, the project has a reduced total capacity (now 1200 MW); the revised project boundary is shown in Figure 1.1.

**Onshore**

4.13 Onshore site selection activities to connect Atlantic Array to the existing National Grid infrastructure began in 2005 with early feasibility study work on both sides of the Bristol Channel.

4.14 Connection options were discussed with National Grid in August 2005. At that time National Grid considered that, given the significant new generation activity in south Wales, particularly around Pembroke and Swansea, it would not be possible to connect Atlantic Array to south Wales for a considerable period. In contrast, National Grid noted that south west England was a net importer of power.

4.15 Having considered where the grid in the south west of England could be accessed in proximity to the wind farm, a grid connection agreement at Alverdiscott was signed between CEL and National Grid Electricity Transmission (NGET) in 2006.

4.16 More recent discussions with National Grid in 2011 confirmed that the south Wales circuits remain congested and that a connection into any location in south Wales would be considerably more expensive for NGET than a south west England option. The discussion was informed by a formal assessment
carried out by National Grid which compared different options.

**Landfall Options**

4.17 A number of landfall options leading to Alverdiscott were investigated. The initial shortlist consisted of Cornborough Range, Instow Sands, Saunton Sands and Woolacombe (see Figure 4.1).

4.18 For each of these four options, work was undertaken to consider potential cable route options between the landfall sites and the existing substation at Alverdiscott. After considerable survey work, a shortlist of landfall options and associated cable routes was presented in the Scoping Report in April 2010. CEL selected the Cornborough Range landfall option in November 2010 following ecological studies on three short listed cable routes and discussions with statutory stakeholders.

**Cable Route**

4.19 The project team has been working with landowners at Cornborough Range, Alverdiscott and along the identified cable route to obtain the rights to lay and maintain cables and construct the substation should the project receive development consent. These discussions, together with the consultation process, have also gathered information relevant to route selection or micro-siting away from local features.

![Figure 4.1: Short Listed Landfall Options](image-url)
Figure 4.2: Onshore Cable Route
4.20 The proposed cable route was shown within the Preliminary Environmental Information and at public exhibitions in 2011. Subsequent to this consultation, the following changes were adopted:

- Reduction of the maximum number of cable circuits from ten to eight, allowing the construction width to decrease from 60 m to 54 m to reduce effects on nearest residential receptors and environmental features;
- Selection of the northern route option near Littleham in order to minimise effects on residential receptors and existing infrastructure, such as septic tanks and soakaways.

Substation

4.21 The siting of the Atlantic Array substation has also been decided through a process of assessment of alternative locations. A range of environmental constraints have been considered when determining the best location for the substation, including landscape, visual, ecology and noise effects. Taking these into account, the proposed site to the west of the existing substation site was selected.

4.22 Following the September 2011 public consultation, further changes were adopted, including:

- Refinement of technology options at the substation site, allowing a reduction in the substation site area from 13.5 ha to a built area of approximately 9.5 ha. This gives a total substation site area of 13.4 ha, including earthworks and the access road;
- Allowance of a buffer along the southern side of the site adjacent to the existing watercourse.

Changes Following Section 42 Consultation

4.23 The draft ES was published in June 2012 and was subject to formal consultation with statutory bodies. In their consultation responses, a number of consultees acknowledged that the environmental effects had been minimised through the site selection process and, in particular, through the selection of the Cornborough Range landfall option.

4.24 Following the consultation on the draft ES a number of further changes were made, including:

- Further consideration of access arrangements for the construction work site to the west of the River Torridge and at Woodville Farm. This has led to the requirement for limited additional temporary land take to allow access to the work site to the west of the river from the existing highway. In addition, the temporary works area near Woodville Farm has been relocated to a site directly off Tennacott Lane.
to allow direct access into the works area from the highway;

- Consideration of the use of two drilling rigs at the landfall site to reduce the duration of works; and
- Amendments to the planting scheme at the substation site to allow for existing utilities.
5 Project Description

Offshore

5.1 The final layout of the proposed wind farm would be optimised to maximise the energy yield from the site and to minimise environmental effects. Ultimately the number of turbines installed and the precise layout would depend on the individual capacity of the chosen wind turbines. Table 5.1 provides the dimensions for an indicative range of turbines.

<table>
<thead>
<tr>
<th>Indicative turbine size (MW)</th>
<th>Max. number</th>
<th>Indicative hub height (m above LAT)</th>
<th>Max. rotor diameter (m)</th>
<th>Max. blade tip height (m above LAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>240</td>
<td>110</td>
<td>140</td>
<td>180</td>
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<tr>
<td>8</td>
<td>150</td>
<td>125</td>
<td>180</td>
<td>220</td>
</tr>
</tbody>
</table>

Note: LAT = Lowest Astronomical Tide.

5.2 The project would be limited to 1200 MW of installed capacity. Therefore, the number of turbines installed would be determined by their rated capacity, i.e. the amount of electrical power a turbine would produce. The number of turbines which would be installed at Atlantic Array would not exceed 240. The largest turbines that may be installed would have a maximum tip height of 220 m and an indicative hub height of 125 m above sea level. If turbines of a rated capacity smaller than 5 MW or larger than 8 MW are installed, their physical characteristics would be within the limits defined within Table 5.1.

5.3 Foundations are required to securely support the wind turbines, meteorological masts and offshore substation platforms to the sea bed, whilst withstanding loads from the wind and the marine environment. They also provide safe access and a safe working environment for operational and maintenance activities. A range of foundation types are being considered. These include:

- Multipile or jacket foundations, which typically consist of four main legs which are linked by a lattice of cross-braces. Each leg is secured to the sea floor using a driven or drilled pin-pile or may be held in place by a suction caisson (similar to an inverted bucket, the hydrostatic pressure and the seabed properties provide the force required to hold the structure in place);
- Gravity base structures, which comprise a large diameter base constructed of reinforced concrete or steel which sits on the seabed to support the
turbine tower. The gravity base solution relies on the dead weight of the structure to support the turbine, and to maintain position and verticality;

- Floating concepts are being developed to meet the challenges of a growing offshore wind industry, which seeks to develop projects in areas of deeper water. Floating structures are fixed to the seabed using a number of techniques, such as tension legs, or catenary chains, attached to drag anchors, suction caissons, gravity anchors or pin piles. The supporting structure may sit completely below or across the water line;
  - Suction monopods, which utilise a single suction 'bucket' to support a steel/concrete columnar structure. The weight of the water above the bucket and the soil strength provide the force required to hold the structure in place; and
  - Tripod and braced column structures, similar to multipile/jacket foundations. These typically comprise a central steel column braced to three legs that are pinned to the seabed. Suction caissons may be used as an alternative to pin-piles.

5.4 Figure 5.1 illustrates indicative foundation types. Further details of the foundation options being considered are presented in the ES (Volume 1: Chapter 5, Project Description).

5.5 In addition to the turbines, Atlantic Array would include up to five meteorological monitoring stations. Meteorological stations are essential to provide meteorological and oceanographic data from the site. It is anticipated that at least one meteorological station would be installed in advance of the main construction period to provide data to inform the detailed project design. The necessary consent for this structure would be obtained separately from the consent for the main wind farm development.

5.6 Atlantic Array would include between two and four offshore substations. The location of these would be determined once the turbine layout has been decided. The power from the turbines would be delivered to the substation by sub sea cables. Transformers housed in the substations would step up the voltage for delivery to the shore via the export cables.

5.7 Submarine cables are required to connect turbines together into groups or strings. Each string is then connected to an offshore substation. Up to eight higher voltage cables would then export electricity from the offshore substations towards the shore, where they would be joined to the onshore cables.
Figure 5.1: Indicative Foundation Types
5.8 The length of submarine cable required is dependent upon the detailed turbine layout, the number of offshore substation platforms and the voltage capacity of the cables selected. The layout would be carefully chosen as part of the final project design, which would include undertaking a cable routing and burial risk assessment, that will take account of any obstructions, including sensitive habitats or wrecks.

5.9 The offshore cables would be buried where possible, and protected where it is not feasible to do so, to prevent movement of the cables, to limit potential environmental impacts and to prevent any navigational risk to other marine users.

5.10 Possible cable installation techniques include:

- Ploughing: The cable is simultaneously laid and buried. The cable plough lifts a section of the seabed deposit and lays the cable below it. The seabed deposit is then returned to its original position;
- Trenching: A remotely operated vehicle fitted with a cutting attachment is used to cut a trench into the seabed as the cable is simultaneously laid. This option may be required where stiff clay or rock is present; and
- Jetting: The cable is first laid on the seafloor. A remotely operated vehicle equipped with high pressure water jets then proceeds along the cable route, fluidising the seabed around the cable, allowing the cable to be lowered.

5.11 Further details of the cable installation options are provided in the ES (Volume 1: Chapter 5, Project Description).

Onshore

5.12 Atlantic Array would require development onshore, comprising electrical infrastructure to allow the electricity generated by the offshore wind turbines to be transferred into the National Grid transmission system. The onshore development would include the cable landfall site at Cornborough Range and the onward cable route from the landfall location to the existing 400 kV substation, located at Alverdiscott, north Devon.

5.13 The onshore cable route would be approximately 14.3 km in length from the landfall to the substation. A new substation would be required adjacent to the existing substation at Alverdiscott to transform the voltage coming in from the wind farm to the voltage being distributed via National Grid.

5.14 From the landfall site, up to eight cable circuits would be buried underground along the proposed cable corridor to the new substation at Alverdiscott. The
landfall and cable laying activities would be temporary and land within these construction areas would be reinstated to its former use after construction, with hedgerows replanted. The proposed substation at Alverdiscott would be an operational structure, designed to remain in situ during the life of the Atlantic Array project.

Onshore Cable Route

5.15 The cables would be buried underground within trenches. One cable circuit would be accommodated within each trench. Therefore, up to eight trenches would be required.

5.16 The cables would be buried underground at a typical depth of approximately 1.2 m. The burial depth would usually range between 0.9 m and 2.5 m, with 2.5 m only exceeded where the route is required to cross beneath features such as pipelines, land drains, highways or rivers.

5.17 Cables would be supplied in lengths. Where two cable lengths meet they would need to be joined together via a jointing bay, which would also be used to allow access for testing and repair of cables. Cable joints would be required approximately every 800 m to 1,100 m along the route.

5.18 The cable route construction corridor would be fenced from stock and public access. Allowances would be made for private land access, stock crossing and relevant environmental constraints. The topsoil and subsoil would be removed and stored separately in order to retain its integrity. Required drainage works would be undertaken to protect land and waterways and contain any movement of sediment.

5.19 The onshore cables would be buried within a temporary construction corridor of up to 54 m wide. The construction corridor would allow for up to eight cable trenches, a temporary construction access road, storage for topsoil and subsoil on both outer edges of the corridor and appropriate separation distances. An indicative construction corridor cross section is shown in Figure 5.2.

5.20 Access routes to the construction corridor and construction work sites have been agreed in principle with Devon County Council. It is recognised that the existing road network along much of the route is constrained by narrow roads. Therefore proposed construction work sites have been located, where possible, adjacent to existing major roads such as the A39. From these locations it is proposed that construction traffic would utilise the temporary haul
road within the 54 m construction corridor to access other parts of the route.

5.21 Once the cable installation work is completed, the haul road would be removed and the ground reinstated using the stored topsoil and subsoil. The temporary works site areas would be removed and the land reinstated to its former condition. Once installed, the cables would occupy a corridor approximately 34 m wide.

5.22 Hedges would be replanted using locally sourced native species. Suitably qualified and experienced contractors would be used to undertake the reinstatement, which would be based on restoring the hedge to match the remaining hedgerow at each location.

Landfall and Cable Route Crossings of the A39 and River Torridge by Horizontal Directional Drilling (HDD)

5.23 A technique known as Horizontal Directional Drilling (HDD) would be used to pass the cable underground beneath the following features:

- The cliffs at Cornborough Range, as these form part of the Mermaid’s Pool to Rowden Gut Site of Special Scientific Interest (SSSI), which is designated for geological reasons;
- The A39, which represents one of the main routes through the project area for both local and longer distance traffic; and
- The River Torridge and its floodplain, the A386 and the Tarka Trail.

Figure 5.2: Indicative Cross-Section – Construction Corridor for Cable Installation (Not to Scale)
Landfall

5.24 The landfall site is located to the south of Westward Ho! at Cornborough Range. At this location, an HDD operation undertaken from the proposed landfall site would drill beneath the cliffs, exiting in the sea bed. The proposed landfall site is located at a low point in the cliffs to the north of an existing wastewater outfall pipe associated with the South West Water wastewater treatment works.

5.25 The cliffs at Cornborough Range form part of the Rowden Gut to Mermaid’s Pool Site of Special Scientific Interest (SSSI), which is designated for geological reasons. The use of the HDD technique has been selected to pass beneath the exposed rock strata for which the site is designated. The construction work site would be located behind the cliff top and coastal path.

A39

5.26 The cable route would cross the A39 between Ford and Abbotsham Cross, east of the roundabout at Abbotsham Cross. It is proposed to utilise HDD for this crossing as the A39 represents one of the main routes through the project area for both local and longer distance traffic.

River Torridge

5.27 The cable route would cross the River Torridge to the south of Bideford and to the south of the Torridge Estuary SSSI. At the crossing location, the A386 runs to the west of the river and the Tarka Trail is located to the east. It is proposed to utilise HDD for this crossing in order to minimise effects on the river, A386 and the Tarka Trail.

5.28 The drill length would be approximately 600 m long and would start and finish beyond the river floodplain.

Substation

5.29 A new onshore substation is proposed adjacent to the existing National Grid 400 kV substation at Alverdiscott, which lies approximately 5 km to the south east of Bideford. This substation would be designed to transform the voltage delivered from the wind farm into that suitable for distribution via the national grid transmission system.

5.30 The existing 400 kV substation is located within a grassland field used as grazing land, with a variety of overhead lines crossing the land and connecting to the substation. The proposed substation would occupy a maximum built area of approximately 9.5 ha and a maximum total area of 13.4 hectares (including
earthworks and access roads) located to the west of the existing substation on either side of the existing access road. The land use is currently a combination of arable and pasture.

5.31 Buildings would be provided within the substation to accommodate equipment. Such buildings may be up to 14 m high. Access to the substation would require relocation of the existing substation access road.

5.32 The substation is anticipated to be un-manned during operation and is only likely to require lighting during visits.

5.33 A landscape strategy has been developed for the substation site in order to screen the development as far as practicable, together with providing ecological habitat.

Construction Programme

5.34 The offshore components and onshore substation for Atlantic Array may be installed in a single phase (1200 MW) or in up to three phases of smaller developments (approximately 400 MW each). If the application for the development is successful, it is anticipated that construction would commence in 2016, although some works may commence earlier.

5.35 Offshore construction is currently expected to commence in 2017. A single build for the offshore wind farm (1200 MW) is anticipated to take up to 72 months to complete, comprising consecutive construction periods. Each phase of the wind farm would be commissioned in stages; for example the first electricity generated from a completed stage would be 2018, assuming construction starts in early 2017.

5.36 The development may be undertaken in phases, for example three 400 MW phases, which would comprise of three 24 month construction periods. There is potential for an interval in activity between each construction phase. If built in phases the total offshore construction period, from the start of installation of phase 1 to the end of the installation of phase 3, may be up to 11 years, and the gap between phases may be up to six years. The total time over which offshore construction would actually take place would remain the same, i.e. estimated at up to 72 months.

5.37 Offshore construction would be undertaken in accordance with a Construction Environmental Management Plan (CEMP). The CEMP sets out the key management measures that contractors would be required to adopt and implement. These measures have been developed based on those identified during
the EIA process and are set out within the ES. They include strategies and control measures for managing the potential environmental effects of construction and limiting disturbance from construction activities as far as reasonably practicable.

**Onshore**

5.38 In the event that the Atlantic Array substation is built in a single phase, the duration is anticipated to be approximately three years. If the works are undertaken using a phased approach, each phase may take up to two years. It is possible that the construction phases for the substation may not be continuous (if the construction phases offshore are not continuous). The total duration (with gaps between phases) may be up to 11 years.

5.39 Cable installation may be undertaken either by direct burial or by installation of cable ducts:

- Installation of all cables directly within the excavated trenches (direct burial, single phase installation); or
- Installation of cables for the first phase and installation of ducts for future phases (phased installation).

5.40 In both cases, there would be no more than a single phase of trenching to install cables or ducts, followed by restoration of the affected areas.

5.41 Construction would be undertaken in accordance with a Code of Construction Practice (CoCP). The CoCP is included within the ES and sets out the key management measures that contractors would be required to adopt and implement. These measures have been developed based on those identified during the EIA process and are set out within the ES. They include strategies and control measures for managing the potential environmental effects of construction and limiting disturbance from construction activities as far as reasonably practicable.
6 Offshore Effects

Physical Processes

6.1 The existing environment has been described using data collected from the site by CEL and a review of the existing knowledge about this area and the Bristol Channel generally. The information collected by CEL has been found to be broadly consistent with existing knowledge; including scientific research, government research and statistics and feedback from statutory bodies.

6.2 Atlantic Array lies within an area of large tidal range (up to approximately 10 metres in the east of the site) and strong currents (up to 1.5 m/s in parts of the site). The proposed development site is also relatively exposed to waves originating in the north Atlantic. The maximum significant wave height recorded during the collection of on-site data during 2010 was 5.5 m, although wave heights are found to reduce from west to east across the site. Large (up to approximately 20 m) sand waves are present on the seabed in the north and north west of the site.

6.3 The findings of the assessment indicate that there would only be small and localised changes to waves and tidal currents in the wind farm area, with no effect on features such as sandbanks and shorelines. There would also be no significant effects on sediment movements driven by tide or wave action either close to the wind farm or at the coastlines, effects which have been investigated using computer simulations. Cumulative effects with other developments were also found to be insignificant. The most measurable effects during construction result from foundation installation works when short term, small-scale increases in suspended sediment concentrations occur. However, the assessment showed that that rapid dispersal by the tide quickly reduces the extent of this effect.

6.4 During the operational phase, the most measureable effects were related to scour on the seabed. However, these too would be localised to the foundation structures, where a minor adverse effect is identified, with negligible effects identified across the wider area.

Seabed and Intertidal Habitats and Animals

6.5 Samples of the seabed in and around the Atlantic Array site, and the animals living on and within it, have been collected and analysed. The results of the field surveys were compared to existing information on the area and wider region with the finding that the Atlantic Array area is generally typical of the wider Bristol Channel in terms of habitats and animals. Three main habitat types
characterise the area. The majority of the area comprises coarse gravelly seabed, with sandy sediments dominating the centre of the development site and areas of rocky seabed occurring primarily across a wide area outside the development site to the east and southeast, as well as an area to the north of Lundy.

6.6 The gravel areas support a relatively wide range of animals including worms, molluscs, barnacles and other species growing on the surface of pebbles and stones found in these areas. Sandy areas were found to support relatively few animals. Rocky areas were characterised by a range of animals living on the surface of the seabed including tube-building worms, crustaceans, echinoderms (starfish/urchins), anemones and various other encrusting species. Fast currents were evident across the site, generally reducing the variety of animals which occurred, including those in some of the rocky areas.

6.7 The assessment has considered the potential effects on seabed animals and their habitats from the construction, operation and decommissioning of Atlantic Array. This included, for example, the assessment of effects arising from suspended sediments and deposition during the construction of the project which could affect sensitive species as well as the loss of habitats underneath the wind farm structures when the Atlantic Array is in place. The assessment has also considered the potential for the project to add to the effects on seabed habitats and animals arising from other developments or activities in the region (cumulative effects).

6.8 None of the assessments found that significant adverse effects are likely to occur on seabed habitats or species, with either negligible or minor adverse effects identified. Effects were found to be localised and, with the exception of permanent habitat loss beneath wind farm structures, temporary in nature.

6.9 Cumulative effects arising from the wind farm when considered together with aggregate extraction and commercial fishing activities are considered to result in a potentially minor adverse effect, which is not significant.

6.10 Intertidal areas were characterised during a walkover survey, which identified a wave cut platform of rock at the landfall location of Comborough Range. This platform supported a relatively wide range of seaweeds, a tube-building worm of ecological interest, and various crustaceans and mollusc species.

6.11 No effects are anticipated to occur to intertidal habitats or species since the project is proposing to avoid any works directly in this area by drilling (using HDD)
underneath the shoreline to connect the electrical cables at the coast.

**Fish and Shellfish**

6.12 The fish and shellfish that are found in and around Atlantic Array have been described by reviewing existing information and by sampling the site using commercial fishing trawls, scientific trawls, potting surveys and fish larvae and egg surveys. The studies identified a fairly wide range of fish species, as expected for the Bristol Channel area, including species of commercial and/or conservation value. Several species are reported to have spawning and/or nursery areas in the vicinity of Atlantic Array, including plaice, sole, cod, sandeel, sprat and herring (although the nearest herring spawning ground is located some 20 km from Atlantic Array). However, the site-specific egg/larvae surveys recorded only sprat and sandeel eggs/larvae within the development area. Few juvenile fish were recorded during the surveys to support the use of the area as a nursery ground, although there was some evidence of young rays within the site.

6.13 Of the shellfish species in the Bristol Channel, only the spawning ground of the European lobster overlaps the development site, although edible crab might overwinter in the area as they have been recorded from the south of the site and suitable seabed is present within the array area. The Bristol Channel, and therefore the Atlantic Array site, is also within a general migration area for Atlantic salmon, twaite shad, allis shad, river and sea lamprey, sea trout and common eel.

6.14 The assessment has considered the potential effects arising from all phases of the Atlantic Array development, including construction phase increases in suspended sediments and subsequent deposition effects; disturbance, including noise effects from piling and electromagnetic fields (EMF) generated by electricity cables; habitat loss; and the potential for new habitat to be created by the wind farm structures, together with attendant reef effects. Cumulative effects arising from Atlantic Array when combined with effects from other developments or activities have also been examined.

6.15 No significant adverse effects were identified during the study with all effects, both adverse and beneficial, from the project found to be negligible or minor. Temporary and long term habitat loss/disturbance was deemed to be of negligible significance to fish and shellfish resources as the proportion of habitat lost is relatively small and the associated habitats are widespread and common within the Bristol Channel. Noise disturbance effects on fish communities were found to be of minor
significance as the mitigation proposed would ensure that piling noise would mostly result in avoidance behaviour; any potential injury or mortality would be limited to less than 50 m from the piling activities. No significant barrier effects on migrating fish were predicted to result from the project.

6.16 The cumulative effects of Atlantic Array with aggregate extraction activities and cumulative noise effects from other projects in the Bristol Channel would be limited to minor adverse effects.

Marine Mammals

6.17 The distribution of marine mammals in and around the Atlantic Array site has been described using available information and by surveys conducted over a 12 month period. This included monthly visual observations made from boats, underwater sound recordings taken using hydrophones towed behind the boat during these surveys, and data collected from static sound recorders deployed underwater in four locations throughout the period of the surveys to record the calls of dolphins and whales. Additional data was also collected over a 24 month period during bird surveys conducted from boats and aeroplanes across the site.

6.18 Harbour porpoise, short-beaked common dolphin and grey seal occur year-round at Atlantic Array. Minke whales use the area during the summer and a range of scarcer species have also previously been recorded. Grey seal sightings were widely distributed. Figure 6.1 illustrates harbour porpoise sighting rates in the area.

6.19 The construction phase of a wind farm development in particular has the potential to disturb or harm these species due to the use of piling for some foundation types which may be used for the wind farm structures. The assessment of effects on marine mammals has therefore included detailed studies and computer modelling of factors including piling noise (which could cause disturbance or even hearing damage if not controlled), risk of collision with boat propellers, potential EMF effects from electricity cables and indirect effects from disturbance of prey species.

6.20 With mitigation measures in place, all effects, both for Atlantic Array alone and in combination with other projects, have been assessed as being of minor adverse significance. Importantly, effects were considered to be reversible, with recovery to baseline levels occurring once piling stops. Even though there is confidence in the findings, monitoring commitments have been made by CEL to address some of the perceived underlying uncertainties with regard to marine mammal behaviour in response to construction noise.
Figure 6.1: Harbour Porpoise Sighting Rates
6.21 Due to the potential risk of injury or disturbance to marine mammals during construction, a special permission (European Protected Species (EPS) license) may be applied for prior to commencement of the works.

**Birds**

6.22 The use of the Atlantic Array area, and indeed that of the wider Bristol Channel Zone, by birds has been determined by surveys from boats and aerial surveys from aeroplanes over a period of more than two years as well as several surveys undertaken at dawn/dusk and during the night time. The species recorded include a range of true seabirds such as petrels, shearwaters, gannet, skuas, gulls, terns and auks.

6.23 The sensitive species identified through the baseline characterisation work and consultation comprise Manx shearwater, guillemot, razorbill and storm petrel, gannet, lesser black-backed gull, herring gull, great black-backed gull, kittiwake and puffin.

6.24 Potential effects on birds include disturbance by construction activities, including vessels, avoidance of or displacement from the wind farm area which, for example, the birds may use for feeding, collision risk with the turbines when the birds are flying and potential indirect effects on prey (fish). Cumulative effects arising from other projects, in this case predominantly other wind farms, have also been considered.

6.25 The majority of effects have been assessed as having effects of minor adverse significance. However, during the operational phase, the first stage of the assessment indicated a possible moderate adverse effect due to potential collision with the rotating turbine blades for the regional populations of herring gull and great black-backed gull. The same situation was identified for possible moderate adverse effects on smaller colonies at some Sites of Special Scientific Interest (SSSI) for kittiwake, herring gull, and great black-backed gull. Further analysis was required to determine whether there was an effect upon the sustainability of the populations of these species. This analysis showed that the number of birds potentially affected would not have a significant effect on the relevant populations.

6.26 One other species was calculated to be subject to a potential moderate adverse effect during operation from ‘displacement’, where birds avoid the wind farm area and therefore need to feed and forage elsewhere within the region. This was for razorbill from three local SSSI colonies, however again the detailed sustainability analysis revealed no significant effects at these sites would be predicted to arise.
Figure 6.2: Gannet

6.27 Cumulative effects from other projects were also considered for disturbance and indirect effects upon prey during construction and decommissioning and for displacement and collision during operation.

6.28 The cumulative effect from the impact of disturbance from increased boat traffic was considered to be of minor significance for all ten sensitive receptors. Minor adverse effects due to indirect effects upon prey were also predicted for Manx shearwater, kittiwake, guillemot and razorbill.

6.29 Manx shearwater was considered for both the cumulative impacts of collision with the turbines of Atlantic Array and other offshore wind farms in the wider region; and displacement from Atlantic Array when added together with displacement from other offshore wind farm areas across the region. A minor adverse effect was predicted for both of these potential cumulative impacts.

Nature Conservation

6.30 The Bristol Channel region encompasses a large number of sites that are designated as being important for nature conservation. These include a number of Special Protection Areas (SPAs) designated for certain bird species; Special Areas of Conservation (SACs), which protect certain types of seabed habitats and species; Sites of Special Scientific Interest (SSSIs), which are designated for wildlife or geological interests; and Marine Conservation Zones (MCZs), which are designated to conserve marine plants and animals, habitats or features of geological interest. The project area does not coincide with any currently designated site.
6.31 Although there were proposals for several MCZs in the general area of Atlantic Array, the only currently existing or proposed MCZ in proximity to the project is Lundy, located just southwest of the Atlantic Array development site and formerly a Marine Nature Reserve (MNR).

6.32 An MCZ network in Welsh Territorial Waters is also being developed by the Welsh Government. The approach here is to use the MCZ mechanism to designate existing Marine Protected Areas with higher levels of protection. Options for Highly Protected MCZs are currently being drafted. None of these sites would directly overlap the project site or cable route.

6.33 A wide array of other sites ranging from international to local level designations occur across the region and the data collection programme undertaken under the specific topics, for example marine mammals, birds and marine ecology, has been used to identify features of specific importance within all areas likely to be affected by the Atlantic Array proposal.

6.34 The assessment identified that effects on the seabed habitats and species features of SACs in the area throughout the project lifecycle would be of negligible or minor adverse effect significance. The effects predicted on important migratory fish species were found to be of minor adverse significance. Effects on marine mammals associated with designated sites were also identified as minor adverse.

6.35 In terms of SPA sites, the assessment on the bird species at these protected sites identified negligible or minor adverse effects. There were moderate adverse effects identified for some bird species at specific SSSI colonies during the operational phase of the project through collision with turbine blades for kittiwake (Lundy and Gower Coast SSSIs), herring gull (SSSI colonies of Lundy, St. Margaret’s Island and Castlemartin Range) and great black-backed gull (SSSI colonies of St. Margaret’s Island, Skokholm and Skomer, Offshore Islets of Pembrokeshire, Steep Holm and Grassholm) and from operational displacement of razorbill from the SSSI colonies of Lundy, St. Margaret’s Island, Gower Coast and the West Exmoor Coast and Woods, however all such effects were found to be not significant following further assessment as described in the bird section above. None of these were considered to have significant effects on the designated sites.

6.36 The assessment of cumulative effects arising from Atlantic Array in combination with other projects throughout the region concluded no significant effect for any designated site.

6.37 The effects on the important nature conservation sites have been assessed in detail, but European level and
Ramsar sites are subsequently considered as part of the HRA process, the findings of which are reported in the separate report to inform the Habitat Regulations Assessment (HRA) that accompanies the application for development consent (Document Reference 5.3). This document, and the screening process completed to date (that is identifying sites which need to be included in the detailed assessment and those for which no further consideration is necessary), has been developed in consultation with the statutory nature conservation bodies in both England and Wales.

**Commercial Fisheries**

6.38 The commercial fisheries assessment work undertaken to date has enabled a characterisation of the baseline environment with regard to fisheries in the wider Bristol Channel region and the site itself. This has identified that in common with much of the wider region, the site is fished by commercial vessels, although it does not represent a unique fishing area for any one vessel or vessel type, rather part of wider grounds that are fished at various times of year.

6.39 UK vessels dominate the fishery, although Belgian and French vessels also fish the area, with key species being sole, bass, rays, squid, lobster, crab and whelk. The fishery has seasonal variation, with a peak of landings in summer months.

6.40 The assessment has taken account of direct and indirect effects upon commercial fisheries including aspects such as loss of area, displacement, safety and ecological effects upon targets species. Overall, the effects from construction and decommissioning have been assessed as being of negligible or minor significance on the fishing sector. There are exceptions, however, related to a small number of vessels which were identified as being more dependent upon the Atlantic Array area itself, principally due to a lesser ability to fish alternative grounds relative to the majority of the fishing fleet.

6.41 During operation, the potential for long term loss of fishing grounds has been identified for potting or trawling vessel skippers unable to continue to fish within the Atlantic Array site due to obstructions. Taking a worst case approach, the assessment evaluated effects on the assumption that fishing would not continue within the area when the project was built, and again this led to an increased significance of effect on a small number of vessels which were more reliant on these fishing grounds than the rest of the fleet.

6.42 The trawling sector has been identified as being most likely to be affected, though both trawling and potting
would be subject to the loss of fishing areas within the project boundaries. A wider effect has also been identified arising from the displacement of fishing effort to surrounding grounds, with consequent increase in pressure on vessels that fish these areas and the resources they target.

6.43 The assessment also identified potentially beneficial effects, particularly for potters, once the wind farm is operational through the introduction of hard substrates in form of foundations and scour protection which may provide suitable habitat for key target species such as lobster. Even if potting was not to resume within the project area, the benefits of increased stocks of such shellfish species within the project area may increase the numbers of these target species in areas adjacent to the project.

6.44 Other fisheries (netting and lining) may experience minor adverse effects during the construction phase due to pile driving noise affecting distribution of species, however this sector, which is relatively small and uses the area sporadically, could also gain benefits from the reef effect of the wind farm structures and associated scour protection.

Seascape and Visual

6.45 The project lies approximately 22 km from the coastline of south Wales, 13.5 km from Lundy Island and 15.5 km from north Devon at its closest points. The offshore turbines are therefore expected to be visible from locations along the coast in clear weather conditions.

6.46 A computer generated Zone of Theoretical Visibility (ZTV) has been produced. This identifies locations within a 50 km radius of the offshore wind farm where it may be theoretically possible to see the wind farm. The ZTV is based on topographical height data only and does not take account of structures or vegetation which may obscure views of the wind farm. There would also be some limitations as to the degree of visibility of the turbines due to the distance of the development from the coastline. These limitations arise for a number of reasons, including:

- The curvature of the earth;
- Atmospheric refraction;
- Visual acuity threshold, below which an object would go undetected. The threshold varies from person to person;
- Prevailing atmospheric and weather conditions.

6.47 The ZTV defines the study area for the visual impact assessment.
6.48 There are a range of sites covered by landscape and/or seascape designations within the area of land and seas surrounding Atlantic Array, including nationally designated landscapes: Pembrokeshire Coast National Park; Exmoor National Park; Gower Area of Outstanding Natural Beauty; Cornwall Area of Outstanding Natural Beauty and the North Devon Area of Outstanding Natural Beauty.

6.49 Given the importance of the area, detailed seascape analyses have been completed to assess the significance of the project’s effects on the landscape, seascape and visual resources of the area, as well as effects on the settings of historic landscapes and monuments.

6.50 Substantial revisions to the size of the project boundary and reduction in the maximum number of turbines being considered have been made to limit the impact of the wind farm on the character of the seascape and landscape. However, the project is of sufficient scale to result in the creation of a new and distinct wind farm seascape character unit in the Bristol Channel. The proposal would have an influence over both the seascape surrounding the project and areas of land in south Wales and south west England. However, any change as a result of the proposal would not be of sufficient magnitude to fundamentally alter the character of the overall landward area of the seascape units within the study area.

6.51 The assessment has highlighted that the project would more readily fit within the existing character of open and featureless seascapes in the area, whereas in areas where the project would be visible together with a landscape which is wild, unmanaged and small in scale, the effect on views is more likely to be significant. Some significant effects were identified, particularly where the proposed development would form a dominant new element within the sea when viewed together with Lundy.

6.52 Where views of the proposal are possible, effects would decrease with distance. Overall, 16 of the 52 land based viewpoints and all seven of the sea based viewpoints were identified as likely locations where significant effects would occur during the day. Only 3 viewpoints from Lundy and 4 sea based viewpoints would also potentially experience significant effects at night.

6.53 Significant effects on visual receptors (people) and special qualities relating to seaward views and their source of artistic inspiration would be likely to occur within very limited coastal areas of the Gower AONB and the North Devon AONB. Effects on the special qualities of the AONB which relate to seaward views
and the wildness, remoteness and tranquillity of the area would also be significant in some coastal locations. However, it is anticipated that significant effects would be very limited in either Pembrokeshire National Park or Exmoor National Park, due to the large separation distance from the proposal.

6.54 Within Pembrokeshire receptors at Caldey Island and users of the Pembrokeshire Coast Path between Old Castle Head and west of Tenby would experience a sequence of views where the effects would be significant. Within Exmoor users of the South West Coast Path in the vicinity of Little Hangman would also experience a sequence of views where the effects would be significant.

6.55 The assessment has assumed excellent visibility. In reality, views would be subject to the prevailing meteorological conditions, suggesting that the proposals would not be visible from many of the landward elements of the study area for much of the year. Should meteorological conditions be taken into account the significance of effects on visual receptors are likely to diminish.

6.56 There would be no significant effects on any identified historic seascape character type. However, significant effects at heritage sites on land are predicted to occur at St Govan’s Chapel (Pembrokeshire), at the Gower Landscape of Outstanding Historic Interest and at Lundy Island.

6.57 Importantly, there would be no physical effect on or loss of any landscape features or elements within nationally designated landscapes within the study area. Furthermore all of the operational effects on seascape, landscape and visual receptors identified within the ES would have a lifetime of up to 25 years and would be fully reversible, following the decommissioning of Atlantic Array.

6.58 Photomontages, which represent how the wind farm will look at different points along the coast are provided in Volume 5 of the ES.

6.59 The assessment has not identified any seascape, landscape or visual receptor or heritage assets for which the cumulative effects of Atlantic Array and any other scheme or schemes would be greater than the effects of Atlantic Array alone.

**Marine Archaeology**

6.60 Features of archaeological interest, including known and unknown wreck sites and historic submerged landscapes that might once have been occupied have been described using historic data, literature review and seabed imaging surveys which provide information on
both the surface of the seabed and features which may lie beneath the surface.

6.61 The combined results of the desk-based assessment of archaeological data sources and review of geophysical data collected from the site and cable route revealed:

- 11 charted sites recorded by the UK Hydrographic Office and the Royal Commission on the Historic and Ancient Monuments of Wales, four of which have been verified with marine geophysical data;
- Five uncharted wrecks identified during the archaeological assessment of geophysical data (and rated A1, a site of anthropogenic origin and archaeological interest);
- 140 further geophysical anomalies of anthropogenic origin and archaeological interest (rated A2, a feature of uncertain origin of possible archaeological interest);
- Eight channels of probable prehistoric date and potential archaeological interest within the sub-bottom profiler data; and
- The potential for as yet undiscovered sites and material, including: in situ submerged prehistoric sites and derived artefacts; prehistoric and later wreck material relating to maritime activities within the study area; and the remains of crashed aircraft.

6.62 Whilst the construction of the wind farm could affect the archaeology present in the area, mitigation has been outlined (for example the application of exclusion areas around known wreck sites) which would mean that no adverse effects would occur. All construction works would proceed with due regard for the need to protect remains under a process termed an Archaeological Written Scheme of Investigation.

**Shipping and Navigation**

6.63 Shipping in the Bristol Channel comprises commercial shipping serving important ports such as Port Talbot, Newport, Swansea and Cardiff along the coast of south Wales, Ilfracombe and Appledore in north Devon and Bristol and Avonmouth in the Severn Estuary. Other shipping activity includes commercial fishing, recreational craft and marine aggregate dredging.

6.64 To assess the effects on shipping a number of surveys have been undertaken to gain an understanding of the numbers and types of vessels that use the area together with the routes that they follow. The information on vessels using the area have been used to inform a Marine Navigation and Safety Risk Assessment (MNSRA) to evaluate the impact on shipping and the safety of navigation of the Atlantic Array. The assessment has also been undertaken with
the aid of computer modelling, a ship simulator facility and through consultation with marine stakeholders.

6.65 The assessment was conducted on the assumption that a number of assumed controls would be applied, for example the charting, marking and lighting of the project area and the establishment of safety zones during the construction period of the project.

6.66 The assessment found that some effects would require more controls to be put in place to ensure the safety of navigation once the project was built. These measures, which would be adopted as part of the scheme design, include an active vessel traffic monitoring and management system to ensure no unacceptable effects on safe navigation occur.

6.67 All measures would be implemented in agreement with relevant authorities, including the Maritime and Coastguard Agency and Trinity House.
**Noise**

6.68 The offshore construction activities associated with the proposed development would generate noise and vibration. The assessment of both underwater and airborne noise and vibration has been assessed in detail using computer modelling. No impact is anticipated in terms of vibration.

6.69 The noise effects at onshore and offshore recreational areas, residential properties and public rights of way would be of negligible to minor adverse significance during the construction, operation and eventual decommissioning of the wind farm. It is possible that some of the pile driving periods may be perceptible on Lundy, the north coast of Devon and the south coast of the Gower Peninsular for some of the time, depending upon atmospheric conditions and local weather conditions affecting background noise levels that may mask the piling noise. This would apply when piling activity is in the areas of the site closest to these locations.

6.70 Overall, however, all of the noise generated across the lifecycle of the project would be well within accepted standards.

6.71 The amount of underwater noise that might be generated has been used to inform the assessment on species that might be impacted, particularly by the highest noise levels generated during any piling works for wind farm foundations. These include species such as fish and marine mammals. The results of these assessments have been given in the sections above.

6.72 No significant cumulative noise effects were identified or predicted to occur.

**Other Marine Users**

6.73 The sea around the Atlantic Array is subject to use by a variety of other human users and is occupied by existing infrastructure. This includes:

- Existing subsea cables;
- Marine aggregate dredging;
- Telecommunications systems and
- Military practice and exercise areas.

6.74 The project area is crossed by telecommunications cables, though none of these are currently active. All active cables outside the main array area are at sufficient distance to ensure sufficient separation to allow safe maintenance of the cables. Agreement would also be reached with the owners of the cables to allow wind farm cables to cross them where necessary. Discussions with the operators of these links are
ongoing to agree a solution that would maintain their capacity and reliability.

6.75 Other telecommunications systems, including radio, television and microwave links, have also been assessed with solely minor effects predicted. There remains a possibility that some interference on television signals may arise for some residences in Devon who currently receive television broadcasts via transmissions from Wales. However, if any such effects do occur, there are mitigation measures which can be applied to remove any significant adverse effects occurring.

6.76 Marine aggregate extraction activities occur in proximity to Atlantic Array and a further area which may be licensed in the future occupies an area on the northern border of the site. The project design provides a separation distance from dredging activity that will ensure navigational safety.

6.77 The Bristol Channel is used for a variety of military practice and exercise activities (PEXA), with the closest being the firing danger area at Manorbier, which lies 7.4 km from the northern edge of Atlantic Array. This separation avoids disruption to the ranges and ensures maritime safety.

6.78 In addition to PEXA areas, desk-based research has indicated that there is some potential for unexploded ordnance (UXO) within the project area, with military activity during World War II activities the likely source of this. Prior to construction, site surveys would be undertaken at any locations where risks have been identified and where structures or cables would be placed to ensure no impact on safety would occur.

6.79 No significant effects were identified on any of the other marine users as a result of Atlantic Array, either alone or cumulatively with other projects and activities.

**Aviation**

6.80 The Bristol Channel region and the area around Atlantic Array supports existing civil and military aviation activity. The military and civil aviation assessment has encompassed potential effects on the interests of the National Air Traffic Services Limited (NATS), NATS (En-Route) Limited (NERL), the Ministry of Defence (MOD) and the Civil Aviation Authority (CAA) as well as airports in the south west region for all phases of the project, with operational effects presenting the most potential for impacts to arise. Cumulative issues with other projects or activities have also been assessed.

6.81 Consultation and assessments have identified that the main potential issue for Atlantic Array relates to interference with primary radar systems that track aircraft. The potential for the turbines to comprise an
obstacle to aircraft has also been discussed with relevant stakeholders.

6.82 The assessment has indicated that with standard controls applied to structures the project would not represent a hazardous obstacle to aircraft. This would include the placement of suitable lighting on selected turbines in line with the CAA guidelines.

6.83 The increase in the levels of air traffic associated with Atlantic Array support operations was identified as a modest rise and provided for within the level of existing air traffic services for the region.

6.84 There were three existing radars which might be affected by the turbines due to interference in some parts of the area that the radars cover. However, mitigation strategies have been identified for two of these and consultation is ongoing with MOD to resolve the remaining issue at the Manorbier range.

6.85 The cumulative assessment identified no potential significant effects on aviation or radar, largely due to the location of Atlantic Array and the area of unaffected airspace around the site.

**Recreation and Tourism**

6.86 Tourism is an important aspect of both the north Devon and south Wales regions. The regions are recognised as centres of excellence for water sports, including surfing, kayaking, sailing, boating, fishing and swimming, as well as being home to many popular day trip tourist destinations due to the natural beauty and coastal/rural atmosphere.

6.87 Concerns were raised during the consultation about the potential for tourism to be affected by the presence of the wind farm, with a consequent effect on the tourist industry in the region. It has also been recognised that potential impacts on tourism and indeed recreation in the area, as elsewhere, are influenced by personal attitudes to offshore development.

6.88 A number of visitor and business focused surveys have been completed relating to the impact of wind farm development on tourism activities, in the UK and Europe. These have largely indicated that the effect upon tourism is neutral or positive.

6.89 Much of the research relating to the impact of wind farm developments on tourism activity focuses on perceptions of the developments on the quality of landscapes and seascapes. However, there is little evidence to prove conclusively that a link between changes in the character of a landscape and actual visitor behaviour exists.

6.90 Where a positive impact of wind farm development is anticipated, the rationale tends to focus on the potential
for developments to provide a new visitor attraction (which may attract those who are simply curious about wind energy or eco-tourists with a more in depth interest in renewable energy). Some surveys (e.g. North Hoyle Business Survey) also point towards a perceived positive impact on the image of the area as a result of offshore wind developments.

6.91 During the construction phase of the Atlantic Array development there may be some disruption to offshore recreational activities such as sailing, diving and boat-based angling in the vicinity of the wind farm. Vessels would be restricted by construction safety zones whilst the wind farm is being built, however, no significant long term effects are predicted on offshore recreation.

6.92 No significant disruption of recreation at the coast is anticipated during the installation of cables, as this is being undertaken by drilling underneath the shoreline to avoid affecting this area. No effects are predicted on activities such as surfing in either north Devon or south Wales as the modelling studies on the potential effect of the wind farm on waves at the coast indicated any effects on waves or sediment transport would be limited to the immediate project area with no significant change at coastal locations.

6.93 Potential effects on the tourism economy have also been assessed for all phases of the project including both coastal and inland locations. The assessment identified that there would be some changes to the current existing tourism economy in a small number of areas during the construction, operational or decommissioning phases of the project; however none of these effects were identified as being significant.

6.94 Overall there is no significant effect expected on recreation or tourism activities or the associated tourism economy in the area as a result of the wind farm either alone or cumulatively.

**Socio-economic Effects**

6.95 The detail of the construction strategy for the project is not yet decided, particularly in terms of which port or ports might be used for the construction and operation or maintenance of Atlantic Array and so a scenario based approach was taken to inform the assessment of potential socio-economic effects that would be associated with the project. The approach considered the impact of the construction, operation and decommissioning phases of the development on local and regional impact areas in the south west of England and south west of Wales. The results of the modelling predicts effects, for example job creation, for the two regions separately and so the upper ranges of jobs
created or economic benefits to each could not occur for both regions simultaneously.

6.96 The assessment identified that the most significant effect is that of an increase in employment, including access to jobs for local residents, and for the regional economy through the value of goods and services produced in the region (termed Gross Value Added, or GVA) produced by Atlantic Array.

6.97 In terms of the UK, the scenarios upon which the assessments were made identified that Atlantic Array would support around 7,600 full time equivalent (FTE) person years of employment in the UK during the preconstruction and construction phases, with total employment during operation of some 8,607 FTE person years, which is the equivalent of 430 full time jobs across the UK. Regionally, the assessment has predicted the creation of up to 405 full time jobs in south west England during the construction phase and up to 32 full time operation phase jobs. The equivalent for south Wales created up to 335 full time construction and 145 full time operation phase jobs.

6.98 In a UK-wide context, the lifetime expenditure of Atlantic Array has been calculated to be in the region of £5.7 billion, of which £3.8 billion is related to the development and construction costs and it is estimated that more than half of this would be spent with suppliers in the UK. The assessment also identified the potential generation of between £4 million and £20 million during the pre-construction and construction phase to the local south west Wales economy and up to £358 million to the regional economy. For south west England, these figures were between £6 million and £10 million for the local economy and up to £387 million in the regional economy.

6.99 In terms of change from the situation that exists now on the regional economies and employment rates, the overall scale of effects from the construction and operation of the wind farm is deemed to be low for south west England and medium for south west Wales (due in large part to the comparatively smaller economy of south west Wales) and of minor to moderate beneficial significance respectively.

6.100 In terms of wider economic effects, in both regions (south Wales and south west England) no significant effects were predicted for the commercial fishing or shipping industries during the project lifecycle, with an effect of minor significance for demand on housing and other local services during construction mainly due to the potentially beneficial effect on jobs in the region during this phase of the development.

6.101 At the end of the 20 to 25 year lifetime of the project, the decommissioning of the wind farm would also
support jobs across the UK as a whole, with a total of up to 1,600 FTE person years within the temporary period over which decommissioning would take place. Given the types of skills which would be needed and the locations of contractors which can provide these skills, there is scope for between 20% to 40% of this to be retained in the local and regional areas respectively.
7 Onshore Effects

Landscape and Visual

7.1 There are a number of sites covered by landscape designations within the onshore study area, including the North Devon Area of Outstanding Natural Beauty (AONB) and the North Devon Biosphere Reserve (see Figure 7.1).

7.2 The landfall site and approximately the first 3.4 km of the cable corridor lie within the North Devon AONB. The landfall site is located within a largely undeveloped coastline of steep rocky cliffs of varying heights.

7.3 The design of the cable route has taken into account the presence of existing features of landscape value. The landfall site was selected based on a range of factors, including avoidance of designated areas such as the core area of the Biosphere Reserve and reduced cable length within the AONB. More locally, the cable route design has sought to avoid features of interest such as wooded areas and residential properties. As a result of this selection process, woodlands have been largely avoided by the cable route. No woodlands or trees are located on the proposed substation site.

Effects on Landscape Character

7.4 During the construction phase, temporary effects on landscape character would occur along the cable route as a result of the presence of the temporary work areas and hedgerow crossings. A temporary significant (major) effect on landscape character within the AONB may be experienced as a result of the presence of the landfall HDD works during the construction phase. Following completion of the works, land would be restored to its former use and hedgerows would be reinstated. Following restoration, effects would reduce to minor adverse and would not be significant in terms of the EIA Regulations.

7.5 Effects on the local character areas and types arising from the cable route and HDD works would range from none to moderate adverse (temporary) at worst for the duration of the works, reducing to negligible (for most character areas) or minor adverse (for the most sensitive areas) following completion of the works.

7.6 At the substation site, no designated sites are present and the effects during construction would be limited to barely perceptible views from designated landscapes and direct effects on local landscape character. The construction phase for the substation would lead to minor adverse effects on landscape character at worst.
Figure 7.1: Landscape Designations
7.7 During the operational phase, effects on landscape character would be largely limited to the substation site. The ordinary condition of the landscape and lack of widespread important or particularly attractive landscape features or designations, combined with the presence of an existing substation and pylons, provides the opportunity for introducing the additional elements of the substation without unacceptably significant adverse effects. The changes that would occur as a result of the proposed development would not lead to the loss of any key landscape elements.

7.8 The existing character areas and types provide an extensive setting for the proposed development. This landscape, although predominantly agricultural, contains a number of urban and industrial elements, settlements and networks of transport infrastructure. The proposed substation would form an addition to the existing power supply infrastructure. In distant views, the proposed substation would be indiscernible and the character of the wider landscape would not be affected. Effects on landscape character would be in the range none to minor adverse and would not be significant in terms of the EIA Regulations.

Visual Effects

7.9 With respect to visual effects, the cable route is located close to very few residential properties or rights of way. There would, however, be temporary effects on a small number of properties and on users of the South West Coastal Path and the Tarka Trail during the construction phase. For locations closest to the cable route, landfall and other HDD work sites, the effect may be significant (up to major adverse) on a localised and temporary basis at the highest sensitivity receptors. Following completion of the construction works, no significant effects associated with the cable route or HDD works are likely.

7.10 Visual effects at the substation site during construction would occur at properties in the surrounding area and in longer range views from rights of way, villages and local roads. For the substation the significance of visual amenity during construction would generally be considered as minor adverse, increasing to moderate adverse for a small number of close range viewpoints.

7.11 The local community, in the form of residents of villages and farms, as well as those using the public rights of way, are the most sensitive visual receptors that would be most affected by the proposed substation during operation. Effects would generally be up to minor adverse for views from high sensitivity receptors such
as residential properties. For the closest viewpoints, effects would initially be moderate adverse. Once the proposed planting is established, effects would reduce to minor adverse. None of the effects arising from the substation would be significant in EIA terms.

7.12 Effects during decommissioning are not anticipated to exceed those during the construction phase.

**Ecology and Nature Conservation**

7.13 The cable route has been designed to avoid direct contact with hedgerows, woodland and vegetated watercourses where possible.

7.14 Surveys indicate that a range of species is present, including some common reptiles, dormice, otters and a number of bird and bat species. Results suggest that there are very few active badger setts along the proposed cable route or in the vicinity of the substation.

**Designated Sites**

7.15 No internationally designated sites are present on or within 2 km of the cable route or the substation location. As far as possible, such designated sites and their main features of interest have been avoided in the identification of the proposed cable route and substation location.

7.16 With respect to nationally designated sites, the cable route crosses beneath the River Torridge approximately 1 km to the south of the Taw/Torridge Estuary Site of Special Scientific Interest (SSSI). At this point, the river is designated as the Torridge Estuary County Wildlife Site (CWS). In addition, there is a Local Nature Reserve located in this area (Kynoch's Foreshore Local Nature Reserve). Figure 7.2 indicates the location of statutory designated sites.

7.17 The cable route would be installed beneath the River Torridge using HDD, which would ensure that effects on the river at this location (which is designated as a Local Nature Reserve and County Wildlife Site) are reduced as far as possible. This, in turn, would ensure that effects on nearby nationally and internationally designated sites would be avoided. Effects on designated sites would be none to minor adverse in terms of significance, which is not significant in terms of the EIA Regulations.

**Woodland**

7.18 The proposed cable route has been selected to avoid any areas of woodland as far as possible.
Figure 7.2: Statutory Sites
7.19 There is one very narrow band of woodland along a watercourse which could not be avoided. This consists of low woodland/widened hedgerow dominated by willows, with some blackthorn, ash and younger oaks.

7.20 Effects on this feature would be minor to moderate adverse and may be significant on a temporary basis.

7.21 The width of work in this area would be minimised and would be replanted with similar species typical of this stretch of vegetation on completion. Therefore permanent effects would be negligible.

7.22 Works elsewhere would result in minor adverse effects on small areas of woodland habitat during construction at worst.

Hedgerows

7.23 Due to the nature of the north Devon area, the cable route would cross a number of hedgerows. This would result in the temporary removal of hedgerow to allow cable installation. Gaps in hedgerows would be reduced where possible. Temporary significant moderate adverse effects on hedgerows are anticipated in the short term. Following cable installation, the hedgerows would be reinstated on a 'like for like' basis. Therefore, following reinstatement, no significant long term effects are likely.

7.24 Hedgerow would be permanently removed at the substation site. The project includes the provision of a landscape strategy, which includes areas of new woodland and hedgerow planting. The loss of hedgerow would therefore represent a temporary effect, which would be compensated for by the provision of new hedgerow habitat. This would result in an overall slight net increase in hedgerow length. The longer term effect on hedgerows would therefore be negligible.

Bats

7.25 The project would have temporary moderate adverse (significant) effects on bats as a result of the temporary loss of sections of hedgerow, which could affect foraging and commuting routes during construction. Measures to allow bats to continue to use the hedges overnight during the construction period would limit these effects. Following construction, hedge restoration would ensure that no significant long term effects are likely.

7.26 No bat roosts or trees with high roosting potential are required to be removed by the project. A single bat roost for soprano pipistrelle bats has been identified in a location close to the HDD works near the River Torridge. Measures, such as fencing, are included as
part of the project to limit this disturbance such that no significant effects are predicted.

Dormice

7.27 The project would have a temporary moderate adverse (significant) effect on dormice using hedgerows affected by the construction works. Measures to reduce effects of the scheme on dormice have been incorporated into the project, including phased seasonal habitat clearance measures intended to avoid the need to physically move dormice from their familiar territories, while ensuring they are not injured by the construction works. The reinstatement of all hedges and provision of new habitat as a result of the landscape planting scheme would ensure that there would be no long term significant adverse effects. Given the proposals to include a good diversity of planting, the reinstated sections of hedgerow may offer benefits to dormice in the longer term, with improved opportunities for foraging over the current situation.

Watercourses and Other Habitats

7.28 The project would have some minor adverse effects on local watercourses crossed by the cable route. Such effects would be temporary and would not be significant in terms of the EIA Regulations. Watercourse flows would be restored following cable installation. The procedure for crossing watercourses will be agreed with Devon County Council.

7.29 The project largely avoids other sensitive habitats of particular value for ecology and nature conservation as it is broadly located within improved grassland pasture and arable land. Some small areas of semi-improved grassland would be affected but construction methods would ensure that soil layers are replaced appropriately to allow for habitat restoration following construction.

Otters

7.30 Potential for disturbance to otters is limited and routes from the River Torridge to known foraging areas such as Jennetts and Gammaton Reservoirs would not be obstructed by the scheme. No otter holts or other places of rest have been identified in any locations which would be affected by the cable route, HDD work sites or substation. Effects are considered to be minor adverse (not significant) and temporary.

Birds

7.31 The project would have limited effects on receptors such as breeding, migratory and overwintering birds, many of which are important elements of the designation for sites such as the Taw/Torridge Estuary
and Northam and Braunton Burrows. Assessment has shown that these effects would be minor adverse, as the scheme would put measures in place to minimise disturbance to these species. While some foraging habitats may temporarily be affected, these are commonplace and widespread across the local area. Effects on nesting birds would be avoided by careful timing of habitat clearance. Therefore, no significant effects are predicted.

Reptiles

7.32 Small populations of reptiles, mainly slow worms and some common lizards have been identified which would be temporarily affected by the project. Measures have been incorporated into the project to ensure that reptiles identified close to the development are moved to areas of safety. Therefore, no significant effects are predicted.

Biodiversity Offsetting

7.33 Defra has developed the biodiversity offsetting scheme in order to deliver measurable biodiversity benefits in compensation for losses. A number of pilot areas have been identified to test the offsetting approach. Within Devon, three areas have been identified to trial offsetting, including the North Devon UNESCO Biosphere Reserve.

7.34 Taking into account the comments received during the section 42 consultation process, CEL has committed to the provision of funds to allow new hedgerow to be created through the biodiversity offsetting scheme. This hedgerow would be provided off site at a location within north Devon selected as suitable by the authorities responsible for administering the biodiversity offsetting scheme.

Operation and Decommissioning

7.35 During the operational phase, additional effects would be very limited. The implementation of a suitable drainage strategy would ensure that no long term effects on the watercourse at the southern boundary of the substation or the species that it supports are likely.

7.36 Effects during the decommissioning phase are likely to be less than during construction as cable trenches would not need to be re-opened. Some potential for disturbance may exist, which could be controlled through the implementation of an environmental management plan.
Historic Environment

7.37 Four Scheduled Monuments have been identified within the study area around the project and have been avoided by the proposed route. The closest of these are a limekiln at Hallsannery, on the western edge of the River Torridge over to the south east of the cable route, and Higher Kingdon, located approximately 450 m to the west of the cable route on the approach to the substation (see Figure 7.3).

7.38 In addition, a number of listed buildings are present within the area, including two Grade I buildings, five Grade II* listed buildings, a Grade II* Registered Park and Garden of Special Historic Interest and a number of Grade II listed buildings. The construction corridor avoids these features.

7.39 The phased programme of archaeological survey confirmed the presence of a small number of archaeological sites that had been identified by the desk based study and also found several additional sites. These new sites included evidence for possible Late Iron Age / Early Roman field systems on either side of the River Torridge along with a potential large enclosure located just to the west of Littleham Cross that was not previously identified.

7.40 Potential effects on the historic environment have been reduced through the selection of the Cornborough Range landfall site and the design of the route to date. More detailed routing and design of the substation has allowed the avoidance of known features, such as the Scheduled Monument at Higher Kingdon.

Effects on Buried Archaeology

7.41 Buried archaeological remains are present within land that would be affected by the construction phase of the project. None of the archaeological remains that would be affected during construction are designated.

7.42 However, a collective medium level of value is considered to be appropriate for buried archaeological remains affected by the cable route and HDD works as some of the identified sites have the potential to contribute to regional research objectives. The assessment has identified moderate adverse effects on buried archaeological sites during construction of the cable route and the HDD works. These effects would be permanent but would be offset through a programme of detailed investigation ahead of and during construction followed by the provision of the results of the investigation in appropriate formats.
Figure 7.3: Heritage Features
7.43 The proposed substation would also result in some effects on buried archaeology. The value of the archaeological resource in this area is considered to be low and no significant effects are anticipated.

7.44 A watching brief would be maintained during construction works in order to identify and protect any further finds of historic importance.

7.45 The operational and decommissioning phases of the project would not result in any significant additional effects on buried archaeology.

Effects on Higher Kingdon

7.46 The Roman marching camp that forms part of the Scheduled Monument at Higher Kingdon is located approximately 500 m west of the proposed substation site. The significance of this heritage asset and of the adjacent triple ditched enclosure arises primarily from their potential to yield evidence of past human activity.

7.47 Although nothing is visible on the ground in this area, the setting of the two sites makes some contribution to their significance.

7.48 The visual assessment indicates that the proposed substation would be visible from the eastern part of the Roman marching camp but not from the triple ditched enclosure. However, during construction some elements of construction plant may be visible from most if not all of the Scheduled Monument. This should be considered within the context of the 360° views available from the Monument, i.e. the construction would only fall within a small part of the overall view. The effect is considered to be minor adverse and would not be significant in terms of the EIA Regulations.

Effects on Built Heritage

7.49 Consideration has been given to the potential effects of the construction of the works on built heritage features. For most of the identified heritage resources, the construction works would be relatively distant and effects from the construction works are unlikely.

7.50 One significant effect has been identified; a moderate adverse temporary effect on the closest Grade II listed house to the cable route. On completion of the works, the land would be restored to its existing use and the effect at this location would be negligible in the longer term.

Effects on Historic Landscape

7.51 The cable route, HDD works and substation are located within an agricultural landscape that includes arable land and pasture. The field pattern varies and a review of the historic landscape characterisation has shown
several types of enclosure here dating from the medieval and post-medieval periods. The operational phase of the proposed scheme would not have any substantive effect on the overall historic landscape.

Hydrogeology, Geology and Ground Conditions

7.52 The coastal cliffs at Cornborough Range form part of a Site of Special Scientific Interest (SSSI) (Mermaid’s Pool to Rowden Gut) designated for geological reasons. This area is also part of the Abbotsham Coast (Westphalian) Geological Conservation Review site.

7.53 The cable route and substation site are underlain by Carboniferous bedrock that comprises mudstone, sandstones and siltstones.

7.54 No licensed groundwater abstractions have been identified within or near to the proposed route or substation and no source protection zones have been defined in this area.

7.55 Numerous private water supply sources have been identified in the area surrounding the project, although some of these are now disused. The widespread occurrence of shallow wells used for private water supply indicates reasonable water quality within shallow groundwater.

7.56 The area generally comprises open agricultural land with limited potential for significant contamination. A single historic landfill site has been identified to the west of the cable route on the western side of the River Torridge. The cable route has been designed to avoid this site.

Effects on Designated Sites

7.57 The cable landfall construction work site is located at the cliff top to the south of Westward Ho! at Cornborough Range. The cliffs at Cornborough Range form part of the Rowden Gut to Mermaid’s Pool SSSI, designated for its geological interest. The SSSI relates to a 5 km section of coastal cliff and foreshore exposure. In addition, the cliffs are designated as a Geological Conservation Review site. It is proposed that HDD would be used to drill cables beneath the exposed rock strata for which the site is designated. This approach has been discussed with Natural England and is designed to avoid any direct effects on the SSSI and avoid any loss of exposure of the designated strata. On the basis of this approach, there would be no significant effect on the SSSI or Geological Conservation Review site.
**Contamination Effects**

7.58 The main stages of the construction phase that could have an effect on hydrogeology, geology and ground conditions are the construction and excavation of cable trenches, the construction and operation of the construction work sites, HDD at the landfall site and excavation of the substation foundations.

7.59 The project has been designed to avoid known areas of contamination, such as landfill sites, in order to minimise the risk of mobilisation of existing areas of contamination. The project would include a range of pollution and runoff control measures to protect groundwater resources and land quality during the construction phase, implemented through the CoCP. Predicted effects are in the range negligible to minor adverse.

7.60 During operation, there would be some limited need for maintenance at the substation and, to a lesser extent, at cable jointing bays. Protocols would be in place to ensure such works were undertaken in a controlled manner to ensure that the potential for contamination would be limited.

7.61 The decommissioning phase may result in some effects similar to those considered for the construction phase. The principal effect at this stage relate to the storage and handling of hazardous materials. The use of protocols developed with the appropriate authority would be sufficient to control such effects.

**Effects on Groundwater and Private Water Supplies**

7.62 A number of private water supplies have been located close to the cable route construction corridor. However, many of these supplies are no longer utilised. The closest source used to supply dwellings is approximately 50 m from the proposed cable route and approximately 20 m from a temporary access route. Overall, taking into account the measures proposed to be implemented through the CoCP, effects on private water supplies during construction are not likely to be significant and would be minor adverse at worst. No significant effects on private water supplies are anticipated during any phase of the project.

7.63 Changes to the groundwater system are unlikely to occur for the majority of the route due to the shallow depth and location of the cable route. However, for localised areas where groundwater may be encountered, measures would be put in place to allow water to be managed and disposed of without significant effects on sensitive receptors.
Hydrology and Flood Risk

7.64 The proposed landfall, cable route and substation are located within the catchment of the River Torridge. The River Torridge has its source close to the border between Devon and Cornwall, to the south west of the project. The River Torridge reaches this confluence with the River Taw near Instow to the north of the project, before discharging to the Bristol Channel at Bideford Bay.

Effects on Flood Risk

7.65 The installation of cables at the landfall site at Cornborough Range would be undertaken by HDD techniques. This would avoid the need for any trenching through the cliffs and would therefore avoid effects on the natural flood protection provided by the low cliff in this location. The proposed landfall work site is located at the cliff top and falls outside the area of flood risk. Therefore, the construction works in this area would result in negligible effects in relation to flood risk.

7.66 The River Torridge is the only major watercourse on the cable route. At this location, HDD would be used to pass beneath the channel and the associated floodplain. There would be no intrusive works to the river bed, banks or within the floodplain.

7.67 Construction works would be undertaken from work sites located on either side of the river, outside of the floodplain. Therefore, the construction works in this area would result in negligible effects in relation to flood risk.

7.68 The works would require crossing of some minor watercourses and their floodplains. However, in all cases, any flow present in the watercourses would be diverted and returned downstream of the works. Measures would be taken during cable excavation to control runoff.

7.69 Following completion of the works, watercourses would be restored and the flow returned. Minor adverse effects on flood risk are predicted to occur on a temporary basis. These effects would reduce to negligible on completion of the works.

7.70 The proposed substation itself lies outside of any areas of identified floodplain. The substation and ancillary works would occupy an area of up to 13.4 ha. In addition, a temporary construction work site of approximately 1.6 ha would be required. This would result in the creation of new areas of hardstanding, which could potentially increase the rate of runoff from the land.
Figure 7.4: Watercourses and Flood Plains
7.71 Siting of the substation has taken into account flood risk and policy guidance. The site is considered to be appropriate for the proposed use.

7.72 Construction effects would be controlled through the use of a construction drainage strategy to ensure that the rate of runoff would be controlled.

7.73 A Flood Risk Assessment has been undertaken to consider the operational flood risk associated with the proposed development. This indicates that the use of attenuation would ensure that discharge could be controlled to a rate of run off equivalent to a greenfield (undeveloped) site. The significance of effect would therefore be negligible. Overall, no significant effects on flood risk have been identified for any phase of the project.

Effects on Water Resources

7.74 The construction of the cable route would require the crossing of a number of minor watercourses. A range of measures are proposed to control runoff and to ensure that the risk of pollution through spillage is minimised. Following completion of the works, watercourses would be restored to their original condition. Taking into account the measures proposed, the effect on water quality is considered to be minor adverse. Effects on the structure of the minor watercourses crossed by the cable route may be moderate adverse in some cases. However, this would be a temporary significant effect and the watercourses would be restored following completion of the construction works such that effects in the longer term would not be significant.

7.75 During HDD works, it is not anticipated that any works would be required in the floodplain. Measures would be in place to prevent pollution or damage of the River Torridge, including control of substances used during the drilling works. As a result of the use of HDD for the laying of cable beneath the River Torridge, sediments would not be disturbed. Taking into account the measures proposed to control effects on water quality, no significant effects on the River Torridge are anticipated.

7.76 With respect to the substation, effective pollution and runoff control measures would ensure that the risk of pollution through spillage is minimised during construction. In addition, it is proposed that water quality monitoring would be undertaken for the watercourse to the south of the site before, during and after the works. As a result effects would be negligible to minor adverse.

7.77 During operation, activities at the substation site would be limited to routine maintenance. General
maintenance would be carried out to pre-defined procedures designed to control contamination. Known sources of potential contamination, such as transformers, would be located within bunded areas. The drainage strategy would include measures to control the quality of runoff, including capture and treatment of site runoff prior to discharge. In addition, the location of the substation site has allowed for a buffer of a minimum of 8 m from the watercourse to the south of the site to ensure that no spillage directly to the watercourse would be possible. Overall, no significant effects on water resources are anticipated to arise during construction, operation or decommissioning of the substation.

Agricultural Land Use and Soils

7.78 The landfall site, onshore cable corridor and substation are generally located within land in agricultural use around Bideford.

7.79 A review of available information in relation to soil types has been undertaken, together with an auger boring survey. The agricultural land in the area is characterised by two main soil types, those developed over the geological Bude formation, consisting mainly, but not entirely of sandstones, and those developed over the Bideford and Crackington Formations consisting of mudstones and siltstones.

7.80 Agricultural land quality is conventionally assessed by applying the MAFF Agricultural Land Classification system. This places land into one of 5 grades, with Grade 1 the highest and Grade 5 the worst quality, according to the degree to which its physical characteristics impose long-term limitations on its agricultural use (range of crops, yields, consistency of performance, inputs required etc.).

7.81 Survey work has found that the majority of the land within the study area should be graded a mixture of grade 3a or 3b, with isolated soil profiles eligible for Grade 2 where light textured, deeper soil profiles are identified.

7.82 Visits to the area found the land in the western part of the route to be dominated by grassland used for a variety of livestock based enterprises. To the east of the estuary, much of the land on the higher flatter ridge running west to east towards the substation location is currently being used for arable crops, with grassland fields restricted to more sloping areas of land and also in the fields adjacent to the estuary.
Effects on Agricultural Land Quality

7.83 Construction of the project would result in effects on soils and agricultural land quality. There would be a temporary loss of approximately 84 ha of predominantly grades 3a and 3b quality land associated with the cable route and the development of construction work sites. This would result in a minor to moderate adverse effect, which may be significant on a temporary basis. As cable lengths are laid, the soils would be stripped, stored and then restored back to their original agricultural use such that no significant effects are predicted after the completion of the cable route works.

7.84 At HDD work sites, which would remain in place for the duration of the construction period, the permanent effect on soils and agricultural land quality would be negligible following restoration of these areas.

7.85 There would be a permanent loss of agricultural land quality resulting from construction of the cable jointing bays and the substation. This would lead to the loss of a total of approximately 14 ha of agricultural land, of which a maximum of approximately 2.8 ha comprises the ‘best and most versatile’ grade 3a quality land. Taking into account the land quality, it is considered that this would be a minor adverse effect, which would not be significant in terms of the EIA Regulations.

Effects on Farming Framework

7.86 Effects on the farming framework would occur during the construction phase of the project. There would be a temporary loss of approximately 84 ha of agricultural land associated with the cable route and the development of the construction work sites. The cable corridor and associated work sites would affect a total of 22 landholdings comprising agricultural land. The farms affected are mainly livestock or mixed farming enterprises.

7.87 The construction of the cable corridor is likely to cause temporary disruption at a local level to a number of holdings within the local farming framework, caused by a number of potential impacts including the direct loss of land, effects on farm access routes and land drainage.

7.88 However, these minor to moderate effects (which may be significant on a temporary basis) would not lead to any farming enterprise being rendered unworkable. The reclamation of these areas following construction would enable them to be reintegrated into the current landholdings so that the effect following reclamation would be negligible.

7.89 Permanent losses of agricultural land from farm holdings would occur where jointing bays are
constructed, as well as at the substation site. The construction of the substation and associated planting would result in the permanent loss of approximately 18.6 ha of land from a single farm holding. However, this is a large mixed farm holding and whilst the loss of this land would result in changes to the day to day management of the holding, it would not affect the wider local farming framework. In addition, there would be small losses from a number of holdings where the cable jointing bays are located. In total these losses would amount to approximately 0.53 ha, which is of negligible significance. There would also be a loss of approximately 0.1 ha of land from a single large landholding at the landfall where the joint transition bays are located. Overall, the significance of the permanent loss of land on the farming framework is assessed to be minor adverse, based largely on the loss of land from a single farm holding as a result of the construction of the substation. This would not be significant in terms of the EIA Regulations.

Traffic and Transport

7.90 The proposed works are located in north Devon, near Bideford. The closest motorway junction to the site is junction 27 of the M5 to the A361. To the south east of Barnstaple the A361 connects with the A39 that bypasses the south of Barnstaple and continues to the west towards Bideford. The cable route crosses beneath the A39 to the south west of Bideford.

7.91 The centre of Bideford is characterised by dense urban conditions with many side roads, accesses, pedestrian and cycle movements, buses and a variety of junction types.

7.92 The surrounding road network is primarily rural. Roads in many areas are limited in width, bounded on one or both sides by high walls and hedges, with tight bends and limited forward visibility and poor visibility at junctions.

7.93 It is recognised that the existing road network along much of the route is constrained by narrow roads. Therefore proposed construction work sites have been located, where possible, adjacent to existing major roads such as the A39. From these locations it is proposed that construction traffic would utilise the temporary haul road within the 54 m construction corridor to access other parts of the route.

7.94 Having regard to the available routes and constraints, routes for light and heavy vehicles to gain access to the project have been agreed in principle with Devon County Council.

7.95 All construction works would be accessed from the construction work sites using the agreed routes. No
vehicles would be permitted to access construction works using local routes other than those agreed with Devon County Council. Construction traffic would not be permitted to leave the temporary cable route haul road using the local road network, other than via the agreed routes (except to continue along the cable route where the cable route crosses the highway).

7.96 The construction of the cable route would require the crossing of a number of local roads and private accesses. Where the cable route crosses local roads and private accesses, access to properties and settlements would be retained. The duration of any local road closures are anticipated to be a period of weeks and would not be likely to exceed two months for any one road closure. The CoCP includes a range of measures to minimise effects. The final details of the proposed construction methods to maintain accesses to private dwellings would be set out in detailed Method Statements provided by the contractor and would be agreed with Devon County Council.

7.97 Delays to drivers using roads around Abbotsham and Littleham would comprise minor to moderate adverse effects over the short term. At Tennacott Lane, it is proposed to introduce traffic management measures so that vehicular access to properties to the south can be maintained. The works near West Ashridge would be phased to ensure continued access to the properties. For these properties, minor adverse short term effects are anticipated. At Abbotsham Court, pedestrian access would be maintained throughout the works. There may be some restrictions on vehicle access for very limited periods. At this location effects may be moderate adverse, which would be significant in the short term.

7.98 In terms of effects on driver delay, there would be a predicted increase in HGV movements on Gammaton Road during cabling works, which is expected to give rise to a negligible to minor adverse effect. The effect on Gammaton Road would be temporary.

7.99 The condition of Gammaton Road would be assessed and, if needed, works undertaken to reinforce and/or repair the carriageway before, during and after construction work has taken place. This would have a negligible effect on travellers whilst carriageway works were undertaken given the short term nature of any such repair works.

7.100 The construction works at the landfall would require heavy vehicles to access the work site via the lanes around Rickard’s Down. It is proposed to manage these movements to minimise the effects on pedestrians and other highway users. The effect would
be minor adverse over the medium term in terms of driver delay and pedestrian amenity.

7.101 With respect to access to other HDD work sites, effects in terms of local properties, traffic through Bideford and pedestrian amenity would be minor adverse.

7.102 The construction of the substation would generate extra traffic, which would have a minor adverse effect on Stony Cross in terms of pedestrian amenity and severance. During the earthworks phase of construction there is predicted to be a temporary moderate adverse effect on Stony Cross, St John’s Chapel and Newton Tracey. This would be considered significant during this part of the construction works on a temporary basis.

7.103 The transport of abnormal loads to the substation site would be undertaken using an agreed route and would require temporary route closures and other works to accommodate the passage of abnormal loads. This would lead to a minor adverse effect in terms of driver delay. The improvement of the roads around Gammaton Cross in order to facilitate the passage of abnormal loads would lead to a minor beneficial effect on travellers on a long term basis.

7.104 No significant transport environmental effects are predicted during the operational phase. Although some transport environmental effects are expected during decommissioning, these effects would not exceed those predicted for the construction phase and would be managed through an environmental management plan to be agreed with relevant consultees prior to the works.

Noise and Vibration

7.105 The cable route, HDD work sites and substation are located predominantly within rural areas. A baseline survey has been undertaken for residential properties close to the proposed substation site. Results indicate that no single noise source in the area dominates the noise levels at the survey locations. Noise levels are influenced by meteorological sources (wind, wind through trees and bushes and rain); nearby wildlife (birds, farm animals, barking dogs); intermittent nearby road traffic noise; farm machinery; and aircraft passing overhead.

7.106 Noise and vibration during the construction, operation and decommissioning of the cable route and substation have been predicted and assessed in accordance with relevant international, national and local standards and guidance. Noise has been predicted using a detailed computer noise model.

7.107 The project includes measures to control construction noise impacts, including the implementation of a CoCP.
Taking these measures into account, the results of the noise and vibration assessment indicate that the significance of effects from the construction of the cable route, HDD works and the substation would be negligible.

7.108 The exceptions to this would be the closest properties to the River Torridge HDD drilling site (minor to moderate adverse effects). Further mitigation measures have been set out for these receptors, including the use of noise barriers, where required. Implementation of these measures would reduce the significance of effects to negligible.

7.109 During the operation of the project, effects are expected to be limited to the operation of the substation. Modelling of the substation indicates that the significance of effects would be minor adverse, taking into account the measures adopted to control noise effects such as acoustic enclosures. Noise would be controlled through a noise limit to be implemented as a condition of the consent, through the DCO.

7.110 During decommissioning, effects would be limited to activities at the jointing bays and at the substation site. As a worst case it has been assumed that effects arising along the cable route may be similar to those during construction, with the possible addition of concrete breaking activities. Modelling has been undertaken to indicate the likely effects associated with decommissioning of the substation. This indicates that effects during decommissioning of the cable route and the substation would be negligible.

Community Effects

7.111 The landfall site and cable corridor up to the A39 are located within the North Devon AONB. The beach at Cornborough Range is publicly accessible via the coastal path and is used by the local population and tourists. Surfers also use the coastal path to access the beach. Land at Kipling Tors to the north and at Abbotsham Cliff to the south is under the ownership of the National Trust.

7.112 Recreational or tourist facilities located within the area comprise the section of beach described above and an extensive network of public footpaths and bridleways. In addition, there is an area of land to the east of the Wings Business and Training Centre at Lendon Barn, Abbotsham, through which the cable route passes.

7.113 Near the landfall, the cable route would pass beneath the South West Coast Path, a National Trail route running for 630 miles along the coast. At the River Torridge, the route would pass beneath the Tarka Trail.
Figure 7.5: Public Rights of Way, Recreational Routes and Facilities
7.114 The cable in these areas would be constructed using HDD such that these routes would not be directly affected.

7.115 The district of Torridge, within which the onshore components of the project are located, has a broad economic base with tourism related employment forming an important element in the local area. The economy in the area includes hotel and other tourist accommodation, camp sites and caravan parks, country parks, historic gardens, fishing facilities and visitor attractions. In addition, there are a range of uses associated with the Taw-Torridge estuary, including the Appledore shipyard, local lifeboat station, summer ferry and vessel moorings.

7.116 Effects on the use of recreational and tourist resources would only arise during the construction phase of the onshore works. These effects would be limited to those locations where the onshore cable trench crosses a public right of way and other routes used by walkers, cyclists or horse riders. During the construction works these routes would need to be temporarily closed or diverted, although the effects would be temporary and localised. These effects would be minor adverse.

7.117 No other recreational and tourist resources would be directly affected during construction phase, although users of routes close to the directional drilling and cable installation works, such as the South West Coast Path and the Tarka Trail, are likely to be aware of the construction works. Access would be maintained to holiday accommodation and other recreational or tourist facilities such as fishing lakes.

7.118 Those public rights of way and routes used by walkers, cyclists or horse riders affected during the construction phase of the project would be reinstated to their previous condition following the completion of the construction works and public access would continue to be provided by the existing public rights of way network. The operation of the onshore cables and substation would therefore have no significant effects on these resources.

7.119 Decommissioning is unlikely to have any significant effects on public rights of way and other recreational/tourist resources within the study area.

7.120 An independent socio-economic study has been undertaken by BVG Associates to investigate the potential impact of the Atlantic Array Offshore Wind Farm on the local economy of south west England. This study drew up four socio-economic scenarios to represent different possible choices of port for the project and to calculate the impact that these could have on the local economy and jobs.
7.121 In relation to the onshore works, all four scenarios assume that during the installation phase of the project, there would be some local construction activity associated with the onshore substation building and the onshore cable. During the construction period it is estimated that local suppliers could generate additional gross value added to the local economy; that is the value of goods and services produced in the local area as a result of the project. In addition, it is estimated that the project would generate additional employment over four years, resulting in a negligible to minor beneficial effect.

7.122 The operation and maintenance of the onshore substation is estimated to account for all the long term local economic and employment effects. Although the maintenance activities relating to a substation are not intensive, they are calculated to generate additional gross value added to the local economy and support a very small number of local full-time equivalent employees annually over the lifetime of the project.

**Air Quality**

7.123 Air quality in the district of Torridge is generally very good and Torridge District Council has not designated any Air Quality Management Areas as concentrations of all pollutants are below the relevant objectives and limit values.

7.124 An assessment of the air quality effects associated with the onshore elements of the Atlantic Array project has been undertaken. For the operational phase, no sources of atmospheric pollutants are proposed. The assessment has therefore focused on the risks associated with dust emissions associated with the construction and decommissioning phases of the project.

7.125 Dust control measures would be implemented as part of the project. For nuisance dust, the main potential effect could be the soiling of surfaces, particularly window sills, cars and laundry. Any such effects arising would be temporary and localised. However, dust control measures would be incorporated as part of the project taking into account good practice guidance. Implementation of the CoCP would ensure that dust levels would be controlled such that there would be no perceptible nuisance to humans. Furthermore, levels of dust are anticipated to be below the level at which ecological receptors may be affected.

7.126 Taking this into account, together with good baseline air quality conditions and overall low population density, it is considered that the significance of dust effects would be negligible to minor adverse.
Electric and Magnetic Fields

7.127 The impact of electric and magnetic fields (EMFs) that would be produced by the onshore electricity transmission assets for Atlantic Array have been assessed.

7.128 All equipment that generates, distributes or uses electricity produces EMFs. As a consequence of their design, some types of electrical equipment do not produce an external electric field. This applies to underground cables and gas insulated switchgear (GIS) equipment. These are enclosed in a metal sheath (a protective metal layer within the cable) and have solid metal enclosures respectively, which shield the electric field. Therefore, the assessment has focused on magnetic fields.

7.129 Magnetic fields are found in all areas where electricity is in use (e.g. offices and homes), arising from electric cabling and equipment in the area. Magnetic fields are not significantly shielded by most common building materials or trees but do diminish rapidly with distance from the source.

7.130 As the nearest residential properties to the proposed substation are located over 200 m away, the new GIS components of the proposed substation would not result in a measurable change in the background magnetic field at the nearest property. This is due to the rate at which magnetic fields drop with distance from electrical distribution assets.

7.131 The closest residential property to the cable corridor is located approximately 40 m away from the edge of the corridor footprint. The maximum calculated field at this location would be within residential background magnetic field levels.

7.132 The magnetic fields produced by the onshore infrastructure would therefore be fully compliant with public exposure guidelines. Therefore, no significant effect is anticipated.

Cumulative Effects

7.133 Cumulative effects with other proposed development in the vicinity of the onshore elements of the Atlantic Array project have been considered. A number of allocated sites are proposed in the draft Local Plan, in addition to several proposed energy developments in the vicinity of the proposed Atlantic Array substation. For a limited number of topic areas, there is potential for cumulative effects to arise. However, in each case it is not considered likely that any combined effect would be of a higher level of significance than that assessed for individual developments.
8 Combined Effects

Inter-related Assessment of Effects

8.1 Inter-related effects are those that may arise through the interaction of individual effects on a single receptor. These occur where a number of separate effects, such as noise and air quality, affect a single receptor, for example people. The EIA has identified that scope exists for inter-related effects, particularly on some visual receptors and various animal species. However inter-related effects would not be any more significant than those individual effects identified during the assessment.

Potential for Cumulative Effects

8.2 The potential for additive effects to arise from the cumulative effects of Atlantic Array in conjunction with other projects (existing or planned) or other ongoing activities have been assessed under each topic of the ES. Although there is potential for cumulative effects to arise, it is considered that any combined effect would not be of a higher level of significance than that assessed for individual developments.

Potential for Transboundary Effects

8.3 The potential for transboundary effects (the effect on neighbouring European Member States) has been considered with respect to each of the assessed effects within the individual topics of the EIA. The distance between the Atlantic Array and the boundary of the exclusive economic zone (EEZ) of the nearest member state, the Republic of Ireland, (at 100 km) means that it is concluded that any significant direct or indirect transboundary effects are unlikely. For mobile species (such as marine mammals or certain migratory bird species), effects are not anticipated to be of international concern in population terms or at the site level where these species are named features of the designated sites. These findings on European protected sites will be considered by the competent authority as part of the Habitats Regulations Assessment (HRA) process. No significant effects on economic interests, for example from effects to the operation of fishing or commercial shipping across international boundaries, are predicted.
9 Summary

9.1 This NTS provides a summary of information presented in the ES and is published as part of the application for development consent.

9.2 When built, Atlantic Array would have a capacity of up to 1200 MW and provide new renewable generating capacity, sufficient to provide the approximate annual energy needs of 900,000 average UK households. The project would provide a notable contribution to the UK’s renewable energy targets.

9.3 The Atlantic Array project area has been selected after some seven years of assessment. The current site is considered to represent the most viable location for the development of a wind farm of this size within the Bristol Channel Zone when taking into account environmental, engineering, operational, social and commercial factors.

9.4 The construction and operation of Atlantic Array is likely to generate economic benefits through the creation of new jobs and opportunities throughout all levels of the supply chain.

9.5 The potential effects of Atlantic Array on the environment have been subject to detailed EIA in accordance with relevant regulations and guidance. As part of this EIA process, consultation has already been carried out with a wide range of stakeholders and this will continue with both the local community and statutory bodies as part of the planning application process.

Further Information

9.6 More detailed information on the Atlantic Array project is included in the full ES document of which this document is the summary. The ES documents and supporting information can be downloaded from the Planning Inspectorate website or from the Atlantic Array project website at the following address:

http://www.npower-renewables.com/atlanticarray

9.7 Copies of the ES on DVD can be requested:
▪ By post:
Atlantic Array Offshore Wind Farm,
RWE Npower Renewables Limited,
Auckland House,
Lydiard Fields,
Swindon,
Wiltshire, SN5 8ZT
▪ By email – atlanticarray@npower-renewables.com

9.8 A charge will be made for paper copies.