Beatrice Offshore Wind Farm Onshore Transmission Works Environmental Statement

Non Technical Summary

October 2012

Beatrice
Offshore Windfarm Ltd

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1 INTRODUCTION

1. This Non Technical Summary (NTS) summarises the Environmental Statement (ES) prepared for the Onshore Transmission Works (the OnTW) (the Project) associated with the Beatrice Offshore Wind Farm (the Wind Farm). The OnTW is the onshore infrastructure required to facilitate export of power from the Wind Farm to the national electricity transmission system (NETS).

2. A planning application for Planning Permission in Principle for the Project will be submitted under the Town and Country Planning (Scotland) Act 1997 (as amended) to The Moray Council (TMC) by Beatrice Offshore Windfarm Limited (BOWL). The accompanying ES has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 as amended (the EIA Regulations).

3. The ES reports the findings of the Environmental Impact Assessment (EIA) which has been carried out to assess the likely significant effects of the OnTW on the environment. The EIA for the Wind Farm and associated Offshore Transmission Works (OfTW) is reported within a separate ES which accompanied the consent application submitted to Marine Scotland Licensing Operations Team (MS-LOT) in April 2012.

4. Environmental effects of the Project have been studied systematically through the EIA process and the results presented within the ES are summarised in this NTS. These documents inform readers of the nature of the Project, likely significant environmental effects, and measures proposed to protect the environment during the construction, operational and decommissioning phases.

5. The Project will connect the Wind Farm into the existing national electricity transmission network via a series of transmission cables running from the landfall area to a new substation where it will connect to the NETS via an interface point at Blackhillock.

6. The Project will consist of:

   - Cable landfall point to the west of Portgordon (the landfall);
   - Approximately 20 kilometres (km) of underground cable leading to the substation site (the cable route); and
   - A new substation at Blackhillock connecting to the adjacent NETS substation (the substation).

7. Further description of the Project is provided in Section 6 of this NTS. A full description of the Project is provided in Section 6: *Project Description* contained in Volume 1 of the ES.

8. The existing NETS substation itself is subject to a separate planning application by Scottish Hydro Electric Transmission Limited (SHETL) (the SHETL Project). The SHETL Project involves the upgrade and expansion of the existing NETS substation. It also incorporates an underground transmission cable, which does not form part of the planning application as it is understood SHETL will be developing this element under Permitted Development rights. The SHETL cable route runs

broadly parallel to the BOWL cable route, crossing at two points. The ES considers the potential effects of the Project in combination with the SHETL Project.

9. There are two possible development options which form the subject of the planning application which this ES accompanies due to the fact that the decision has not yet been made as to whether the electricity generated by the Wind Farm will be transmitted as alternating current (AC) or direct current (DC). A number of factors will determine whether the transmission is AC or DC, the final decision will be made during the detailed design process for the Wind Farm. The proposed substation location for both AC and DC options is the same, however, the proposed substation layouts are different.

2 POLICY BACKGROUND AND THE NEED FOR THE SCHEME

10. There are numerous climate change, renewable energy and land-based planning policies relevant to the Project at an international, national, regional and local level. Climate change and the need to reduce carbon emissions underpin these policies and planning policy has been designed to support and deliver a move to low carbon energy production.

11. At an international level, obligatory targets were set by the United Nations to reduce greenhouse gases for those countries that committed to the Kyoto Protocol. Through this Protocol, the UK committed to reducing greenhouse gas emissions by 12.5% from 1990 levels by 2012. The 2009 Renewables Directive raised this target to 15% by 2020.

12. Various policies have been published at a national policy level in line with European policy objectives. The UK Renewables Obligation objective was to ensure that renewable sources contributed 10% of UK electricity supply by 2010. The Renewables Obligation Scotland Order (ROS) was amended in April 2011 to reflect a new target of generating the equivalent of 100% of Scotland's gross annual electricity consumption by 2020 by renewable sources. The UK Renewable Energy Roadmap 2011 notes that the development of offshore wind farm sites is critical to achieving the capacity to reach the 2020 target of 15% of UK electricity consumption from renewable resources.

13. The Scottish Government has its own renewable energy targets. The Climate Change (Scotland) Act 2009 set an initial greenhouse gas emissions target and stated that this target should be reviewed annually. As at September 2011, the current Scottish targets are:

- At least 30% of all energy demand (heat and transport, as well as electricity) will be from renewables by 2020; and
- An output equivalent to 100% of Scotland's demand for electricity to be met from renewables by 2020.

14. The Scottish Government Renewables Action Plan (2009), updated in 2010, sets out the Scottish Government's key objectives to meet its targets for renewable energy. Objectives include continued development of offshore wind technologies, planning and investing in the necessary grid infrastructure for connecting proposed offshore

wind developments, and ensuring the development of Scotland's offshore wind complements Scotland's marine environment.

15. Scottish land based planning policy at Scottish Government level which are relevant to the Project are contained in:

- Scotland's National Planning Framework 2 (NPF2) (June 2009); and
- Scottish Planning Policy (SPP) (February 2010).

16. NPF2 provides overarching guidance for the terrestrial plan-led system and is required by statute to contribute to sustainable development. The document encourages the development of offshore wind, specifically referring to the potential for an offshore wind farm in the Moray Firth.

17. SPP sets out the Scottish Government's overall policy for land use planning. SPP acknowledges that the Scottish Government's commitment to increasing the amount of electricity generated from renewable sources is a vital part of the response to climate change.

18. The current Scottish Government Economic Strategy (2011) includes a commitment to the development of a low carbon economy and renewable energy industry. One of the key aims sought through the document is to decarbonise electricity generation by 2030. Opportunities exist under the low carbon economic strategy across the whole Scottish economy for business and industry. Within the context of the low carbon transition for Scotland's economy, the strategy sets out the Scottish Government's ambition and immediate actions to increase the value of our low carbon environmental goods and services sector (LCEGS) to more than 10% of the Scottish economy by 2015. This sector includes renewable energy; environmental management and low carbon technologies.

19. The planning application and ES will be submitted to TMC. The Statutory Development Plan for this area comprises:

- The Moray Structure Plan (approved in April 2007) (the Structure Plan); and
- The Moray Local Plan (adopted in December 2008) (the Local Plan).

20. The Structure Plan sets out the overarching strategy for development in TMC area. Importantly, the Structure Plan gives general support to renewable energy development through promoting opportunities for the sensitive development of renewable energy and promoting renewable energy in new development.

21. The Local Plan interprets the strategic policies established within the Structure Plan into detailed site specific policies and requirements to be applied by TMC when making decisions on planning applications. It offers broad support to renewable energy developments based on the appropriate mitigation of environmental variables.

3 EIA PROCESS AND METHODOLOGY

22. The requirement for EIA in Scotland is provided by the Town and Country Planning (Scotland) (Environmental Impact Assessment) Regulations 2011 (the EIA Regulations), which transpose the European Council Directive 85/337/EEC as

amended by Directive 97/11/EC. The EIA for the Project has been carried out in accordance with the EIA Regulations.

23. Environmental assessments have been carried out to identify any effects that may be significant in the context of the EIA Regulations. Mitigation is proposed where appropriate to prevent significant effects, where possible.

24. In accordance with the EIA Regulations, the assessment has also considered cumulative effects. By definition these are effects that result from cumulative changes caused by reasonably foreseeable actions together with the Project.

4 CONSULTATION

25. Consultation was undertaken throughout the EIA process. In support of the application, a stand-alone Pre-Application Consultation Report was prepared which reports in detail the process and outcomes of the consultation on the Project.

26. EIA Scoping was carried out for the Project as part of the wider transmission works Scoping Report (i.e. OfTW and OnTW). The purpose of Scoping is to outline the Project to key stakeholders so that their comments can be incorporated into the EIA process.

27. In support of the Project, a number of public exhibitions took place that were designed to provide an opportunity for the public to ask questions, understand the proposals and provide feedback. Full details of the exhibitions are detailed in Section 4: *Consultation* of the ES (Volume 1) and in the Pre-Application Consultation Report.

28. Consultation will continue between BOWL, decision makers and stakeholders throughout the EIA process. BOWL is committed to ensuring stakeholders, including the public are kept informed of project progress before and during the construction phase, and on commencement of operation.

5 SITE SELECTION AND CONSIDERATION OF ALTERNATIVES

29. This EIA has considered the use of alternative sites, alternative designs and the 'no development' alternative. Alternatives have been evaluated on the basis of technical, engineering and environmental constraints identified during the design and EIA process. This process is reported in Section 5: *Site Selection and Alternatives* of the ES (Volume 1).

30. The site selection process for the OnTW was undertaken to establish the optimum route for the cable from the Wind Farm site to potential onshore grid connection sites. Further options to be considered were concerned with the type of substation required and, the location of landfall and substation.

31. The Wind Farm is required to connect into the NETS via an existing substation on this network. Five existing substations and a new offshore hub were considered. The decision on the connection point took into account these substations, and the cable routes and landfall points to get to them. 13 cable route options were considered between the Wind Farm and the five potential connection points.

32. Landfall options were considered on environmental merit, distance from substation, proximity to centres of population and technical feasibility. Five landfall options were assessed which resulted in land to the west of Portgordon being chosen as the preferred option, despite being part of Spey Bay Site of Special Scientific Interest (SSSI). Consultation with Scottish Natural Heritage (SNH) recommended mitigation to minimise the effects on the SSSI. The other landform options were rejected due to unacceptable impacts on landscape and visual, cultural heritage, ecological or human receptors.

33. The consideration of the landfall and cable routes led to the choice of Blackhillock substation connection. This was due to its relatively short cable route, relative lack of environmental constraints and designations and lower onshore grid constraints compared to the alternatives examined.

34. The terrestrial cable route links the landfall point to the substation. The cable route was identified and designed by taking into consideration technical, physical, social and environmental constraints. The cable route is currently indicative, the exact route will be determined following detailed feasibility assessment as the detailed design stage.

35. The Project substation will connect into the upgraded Blackhillock NETS substation. Nine potential locations were identified along the route where the project substation could be located. These were assessed in terms of landscape sensitivity, proximity of residential properties, proximity of cultural heritage assets, access, and visibility. Two locations were identified as preferred options. Further electrical engineering considerations limited the location to close proximity with the NETS Blackhillock substation and further environmental and engineering considerations determined the preferred location.

6 PROJECT DESCRIPTION

36. The Project contains the following elements:

- Cable Landfall - landfall works including the installation of ducting beneath the SSSI and the installation of three subsea cables across the tidal zone;
- Onshore Cable Route - the installation of approximately 20 kilometres (km) of underground cable between the landfall at Portgordon and the new substation at Blackhillock. The underground cables will be installed beneath agricultural land, public roads, railway lines and watercourses. Cable jointing pits (in locations yet to be determined) will be required at regular intervals along the cable route; and
- Substation - a new electricity Substation to be constructed at Blackhillock adjacent to the upgraded NETS substation at Blackhillock.

6.1 LANDFALL

37. The landfall works will involve the pulling ashore of the offshore cables to connect with the onshore cables in transition bays. The cable will be pulled through underground drilled ducts using a technique known as horizontal directional drilling (HDD). A temporary working area will be required at the landfall.

Temporary construction vehicle access will be required to this area during the works.

6.1.1 HORIZONTAL DIRECTIONAL DRILLING (HDD)

38. The underground ducts which the cable will be pulled through will be formed using HDD. The use of HDD will protect the integrity of the SSSI and ensure that the offshore cables make landfall with minimised environmental effects.

39. The HDD works will involve drilling an arc between the two points (known as the launch site and receiving site), to pass underneath the SSSI.

40. Following the completion of the HDD works, reinstatement work will be completed and all temporary equipment removed.

6.1.2 ONSHORE TRANSITION BAYS

41. Onshore transition bays are required to join the offshore export cable to the onshore cables. The OfTW comprise a maximum of three export cables, and therefore requires up to three onshore transition bays which will be located adjacent to each other.

42. The construction of the transition bays is likely to involve:

- Excavation of the transition bay chambers;
- Construction of the concrete chamber walls utilising shuttering and reinforced concrete;
- Back filling areas around the transition bay; and
- Removal and disposal of any surplus excavated material.

43. The landfall working area will be located on agricultural land and will include a contractor's compound. The compound will have welfare facilities, site offices and the storage of plant and machinery.

44. Adjacent to each transition bay there will be a link box. Link boxes are used at cable joints and terminations to provide easy access for cable testing and fault location purposes. Link boxes will require a number of surface level access covers. The area around the transition bays will be backfilled upon completion of the jointing works, but permanent access will be required to the link boxes during the operational lifetime of the Wind Farm for maintenance purposes.

6.2 CABLE ROUTE

45. The route which the underground cable follows is shown on NTS Figure 1. This is the same for either of the AC or DC options.

46. The majority of the cable route passes through agricultural land under arable cultivation. However, it should be noted, the cable route is currently indicative; the precise location of the cable route will be subject to detailed design and feasibility assessment.

47. The maximum permanent cable route width required will be 13 m. A maximum 30 metres (m) wide temporary working area will be required along the cable route, referred to as the cable corridor.

48. The cable corridor will comprise:

- A set of up to three trenches with a total maximum width of 13 m;
- Construction access for vehicles, which needs to allow the safe tracking of construction vehicles in two directions. This will be 5-6 m wide in each direction;
- Spoil storage areas between trenches and at each side (maximum 3.5m); and
- Fencing.

49. Cable is typically supplied in lengths of 1,000 m, and as such a significant number of cable joints will be required along the approximately 20 km cable route to join these sections. The individual cable lengths will be joined together in jointing bays, the precise location of which will be determined prior to construction. The joints will be positioned in locations that will minimise construction effects and any ongoing maintenance impacts.

50. Onshore HDD works may be required for crossing obstacles if open cut trenching is impractical during cable laying operations along the cable route. Potential locations where HDD works may be required include public roads, railway lines and water courses. The cable corridor width would be increased to a maximum of 40 m in HDD locations to incorporate a working area.

6.3 SUBSTATION

51. There are two possible development options relating to the substation design. This will depend on if the connection is AC or DC.

52. The substation site is situated approximately 1 km to the south of Keith as shown on NTS Figure 1. The substation site covers an area of 13.8 hectare (ha) of which a portion (approximately 4.1 ha for AC and 3.2 ha for DC) will be used for the substation itself. The site is currently used for agricultural purposes.

53. Both the AC and DC substation options have a terraced design in order to minimise landscape and visual effects, and accommodate the slope of the site.

54. Due to the height of both the AC and DC design options and the topography of the substation site, a bund will be constructed around the substation in order to provide screening. The bund will be planted with vegetation and trees which will in time grow to a sufficient height to partially screen the substation. BOWL will liaise with TMC to prepare an appropriate landscaping plan for the site.

6.3.1 AC SUBSTATION

55. A typical AC substation design, appropriate for the capacity of the Wind Farm, forms a wirescape development with a maximum height of 11.5 m and an associated control building with a maximum height of 6 m.

56. A typical layout for the AC substation is shown in Figure 6.3. The final design of the substation is likely to have a smaller footprint and smaller components associated with it as the design at this stage represents a realistic worst case.

57. There are two access points proposed to the substation, one at the northern boundary fence of the site and one on the western boundary fence. The selected

access route will be finalised and confirmed at the detailed design stage. There would be a one way boundary road around the site which will allow components to be delivered to the site and vehicles to access the substation for the ongoing maintenance requirements of the substation.

58. The main components associated with the AC substation are:

- Control Building;
- Reactive Compensation Buildings;
- Supergrid Transformers;
- Transformer Coolers;
- Earthing Transformers;
- Auxilliary Transformers;
- Reactors;
- Reactor Coolers;
- High Voltage Switchgear; and
- Harmonic Filters.

59. These components are all external components. The control building will house power electronics, cooling, telecommunications, protection and control equipment, and a battery room.

6.3.2 DC SUBSTATION

60. A typical DC substation design, appropriate for the capacity of the Wind Farm, is illustrated in Figure 6.4. This development option contains electrical equipment within a building, with some external electrical components. There would be a road around the perimeter fence which will allow for the safe delivery of components and the ongoing maintenance requirements of the substation. The main components associated with this substation design are as follows:

- Control Building;
- DC Converter Building;
- Supergrid Transformers;
- Transformer Coolers;
- Convertor Cooler Banks; and
- High Voltage Switchgear.

61. The control building will house power electronics, cooling, telecommunications, protection and control equipment and a battery room.

6.4 CONSTRUCTION PROGRAMME

62. Based on prior experience, it is anticipated that construction of the cable and substation will take place over a maximum period of 30 months at most, although construction activities will not be continuous over this period in any one location.

63. Generally site working hours will be from 0700 to 1900 Monday to Friday for the cable route construction and 0700 to 1900 Monday to Friday and 0700 to 1300 for the substation.

64. Night work may be required in special circumstances (e.g. during delivery of transformers or during HDD activities) and approval for any additional working hours will be sought from the TMC at the appropriate time.

7 ECOLOGY AND ORNITHOLOGY

65. An assessment of the effects upon ecology and ornithology has been undertaken. The assessment included the following:

- Designated sites;
- Habitats;
- Protected species; and
- Ornithology.

66. The assessment considered effects during the construction, phase of the Project.

67. There are a number of designated sites within the study area, there are no significant effects predicted upon these as a result of the Project.

68. There are a number of habitats within the study area, these include farmland, woodland, watercourses and meadow. There are no significant effects predicted upon any of these habitats as a result of the Project.

69. There is suitable habitat for otter, badger and bats within the study area. There are no predicted significant effects upon these species as a result of the Project.

70. There are a number of birds using the study area for breeding, roosting and foraging. There are no significant effects predicted upon ornithology as a result of the Project.

71. There are no predicted cumulative effects as a result of the Project and the SHETL Project.

8 LANDSCAPE AND VISUAL

72. An assessment of the effects of the Project upon the landscape and visual resource was undertaken. The assessment considered effects during construction, on completion, and after 15 years upon maturity landscaping planting, for a 5 km zone around the substation site and a 0.5 km corridor either side of the cable route.

73. The Project lies within an Upland Farmland landscape character area. During construction and on completion significant effects will occur within 200 to 300 m of the Project. Beyond 500 m, effects will be not significant. 15 years after completion, proposed landscaping mitigation will integrate the development into the landscape setting reducing the significance of the effect. After 15 years no significant effects are predicted except at one viewpoint location within 25m of the substation site.

74. No significant landscape effects will arise in connection with any of the assessed phases of the cable route connection.

75. There will be no significant effects on designated landscapes.

76. With this type of development, in this location, significant visual effects will be focussed near the Project and will not be widespread. Effects will be significant for

all assessed timescales for residents nearest to the substation site (Viewpoint S1 at Auchorties) and users of the path which runs past the site to Cairds Wood. BOWL will liaise with Forestry Commission Scotland regarding the diversion of this path, which will likely follow the edge of the substation fence line.

77. For scattered farms within approximately 1 km of the Project and residential properties on the southern edge of Keith, which are over 1 km from the site (Viewpoint S2), significant effects will not arise during the construction phase. The completed Project will have a significant visual effect on local residents with views of the substation site and for users of footpaths in the vicinity. As mitigation planting matures, at year 15, effects on these receptors will no longer be significant.

78. No significant effects will occur further into the town of Keith. There will be locations in and near the town where the substation is visible (e.g. Viewpoint S4 on Union Terrace) but these effects will not be significant.

79. The site will not be seen from the majority of main roads. The clearest views will be from a 1.5 km stretch of the B9014 (Viewpoint S5), which is roughly 1.5 km from the site, but effects will not be significant.

80. The Isla Way, a long-distance route between Dufftown and Keith crosses the countryside to the west of the substation site, passing within 0.6 km of the substation site. Significant effects will arise during construction and on completion, but effects will reduce to not significant after 15 years.

81. There are other paths from which the substation will be visible, including the path to the summit of Meikle Balloch, the most prominent viewpoint in the study area. Effects will not be significant.

82. Effects of the cable route on local residents will be limited to the construction phase and will arise within approximately 200 m of the cable route. National Cycle Route 1 crosses the cable route at Portgordon. Views of construction activity of the cable route will be available for very short sections of the route and as such effects will not be significant.

83. With the proposed SHETL Project at Blackhillock, cumulative landscape character effects will arise due to the proximity of the two substations. In terms of combined views, significant effects will arise for all assessed timescales in the immediate vicinity of the substation site. Significant combined visual effects will also arise on completion for residents and footpath users on the southern edge of Keith (Viewpoint S2 at Seafield Walk, Keith). There will be other places where a cumulative visual effect will be noticeable, for example from Meikle Balloch (Viewpoint S6) or from the B9014 west of Keith (Viewpoint S5), or Union Street (Viewpoint S4), but these will not be significant.

9 ARCHAEOLOGY AND CULTURAL HERITAGE

84. An assessment of the effects of the Project upon the archaeology and cultural heritage resource has been undertaken. The assessment, comprising desk-based study and walkover survey, has been undertaken to identify cultural heritage assets that may be affected by the construction and operation of the Project.

85. There are numerous recorded assets within the cable corridor reflecting the fact that the general area has seen activity throughout history and that the geology and agricultural regime is conducive to the formation of cropmarks, facilitating the identification of later prehistoric assets that would otherwise be unrecorded. There is an appreciable concentration of recorded archaeological assets near the coast and the potential for unrecorded archaeology to be present within the cable corridor is considered high. Elsewhere along the cable corridor, and at the substation site, this potential is considered moderate.

86. None of the archaeological assets identified are of national importance or designated and it is unlikely that any unrecorded assets of national importance are present. Consequently, preservation by record is an appropriate strategy. Following implementation of this strategy all residual construction effects will not be significant; the physical loss of subsurface features being offset by the realisation of their value as sources of data.

87. Keith Conservation Area lies to the north of the substation. Glimpsed views along its streets of the hills to the south are important to its setting. Effects upon its setting have been mitigated through design and the effect is considered to be not significant.

88. No significant cumulative effects have been identified.

10 GEOLOGY, SOILS AND LAND USE

89. A desk-based study of geological, soils and land use data has been carried out in order to identify potential assets that may be affected by the Project and establish their current condition.

90. The only known site designated for its geomorphological features within the study area is Spey Bay SSSI. The landfall area is located within this designated site. HDD under the SSSI is proposed to protect the integrity of the SSSI and ensure that the offshore cables make landfall with minimised environmental effects.

91. There are no other known ground features of significance for their geological importance or sites designated as geological SSSIs in the study area which the Project is likely to have an effect upon. Effects on geology are therefore considered to be not significant.

92. Predicted effects associated with disturbing contaminated land are not significant.

93. Implementation of good practice measures will ensure that any effects to soils are minimised. Effects on soils are considered to be not significant.

94. Predicted effects associated with agricultural land loss are not considered to be significant.

11 NOISE AND VIBRATION

95. An assessment of the noise and vibration impact of the Project has been carried out. Potential effects have been assessed in accordance with British Standards (BS) and other relevant guidance. The effects of noise and vibration from the construction,

operation and decommissioning of the landfall, cable route and substation were considered for the closest noise sensitive receptors (i.e. houses) to the Project.

11.1 NOISE

96. The noise levels created by general construction activities of the cable route, landfall and substation were assessed in accordance with guidance contained in BS 5228 (2009) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 1: Noise*. The level of noise likely to be generated by construction activities has been calculated and assessed against published criteria. Cable Route construction could result in noise levels at potentially significant levels at some houses, but due to the short duration (typically no more than one day) of these levels, this effect is not considered to be significant. Significant effects were predicted for landfall construction work. Mitigation, such as ensuring adequate separation between the construction work and closest houses will be employed, where practicable, with the aim of reducing these effects to a non-significant level. Where such separation is not practicable, additional mitigation will be identified during the detailed design process and agreed in writing with TMC. Construction of the substation was found not to generate significant noise effects, due to the distance to the nearest houses.

97. HDD activities at the cable route and landfall were assessed using the same methodology as for general construction activities. Significant effects were predicted for day, evening and night activities at the cable route and landfall. Day and evening activities require mitigation, such as ensuring adequate separation between the HDD equipment and closest houses, where this would be practicable. Where such separation is not practicable, additional mitigation will be identified during the detailed design process and agreed in writing with TMC. Night-time activities will require additional mitigation such as temporary acoustic screening or enclosure of the HDD equipment. These will be identified in discussion with the appointed HDD Contractors during the detailed design stage for the cable route, and agreed in writing with TMC.

98. Noise levels as a result of increased traffic on the Strategic Access Route during construction of the Project were calculated using the method described in *Calculation of Road Traffic Noise* (Department of Transport, 1988) (CRTN). It was found that the increased traffic levels on the Strategic Access Road (when compared with existing levels) would produce no significant noise impact. Hence, no mitigation is considered to be required.

99. Noise levels as a result of increased traffic on the Local Access Routes during construction of the Project were assessed following the methodology described in BS 5228. It was found that the increased traffic levels on the Local Access Roads would produce no significant noise impact. Hence, no mitigation is considered to be required.

100. The cumulative effects of the construction of the Project and the SHETL Project have been considered. It was found that cumulative construction noise, including cumulative construction traffic noise, would not produce significant effects. Cumulative construction traffic noise was predicted not to require any mitigation.

101. Operational noise effects for the substation were assessed in accordance with guidance contained in BS 4142 (1997) *Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas* and using criteria agreed in consultation with TMC. Operational noise levels were predicted and assessed against the agreed noise criteria. The effects were considered to be not significant. Noise will be taken into consideration in the detailed design process to ensure that noise limits specified in any planning conditions applied will be adhered to.

102. It was found that there is the potential for significant cumulative noise effects from the operation of the Project and SHETL Project substation. Cumulative operational noise effects will therefore be taken into consideration in the detailed design process. Further consultation will be carried out with TMC in order to agree appropriate criteria for cumulative noise. Where necessary, additional mitigation will be incorporated into the design of the substation in order to meet these criteria.

103. Noise effects associated with decommissioning were considered to be not significant for all elements of the Project.

11.2 VIBRATION

104. The proposed construction, operation and decommissioning of the landfall, cable route and substation elements of the development are not expected to generate significant levels of vibration at the identified receptors.

12 HYDROLOGY

105. An assessment was undertaken in respect of the Project on the hydrological resource.

106. The hydrology assessment comprises the results of a baseline desk-based assessment and walkover survey in order to identify all potential water resource assets within the study area during the construction, operation and decommissioning of the Project. There are a number of embedded mitigation measures incorporated into the Project design. This embedded design mitigation includes the crossing of sensitive watercourses by HDD where required.

107. The assessment considered the effects of the Project upon river catchments, surface hydrology, hydrogeology, flooding, Groundwater Dependent Terrestrial Ecosystems (GWDTES), designations, fisheries and public and private water supplies.

108. After taking the project design mitigation into consideration, there are no significant effects upon any of the aforementioned resources as a result of the Project. In terms of the EIA Regulations, there are no significant effects on water resources.

109. Cumulative effects have been identified as being not significant.

13 ACCESS, TRAFFIC AND TRANSPORT

110. An assessment of the Project upon access, traffic and transport has been undertaken, comprising desk-based studies, walk-over survey and traffic surveys to

establish the characteristics of the existing transport network surrounding the Project.

111. Traffic volumes associated with both the landfall works and cable routes would be very low and would not give rise to any significant effects. The substation is estimated to be the highest traffic generator during the construction stage. The substation is forecast to generate an additional 88 vehicle movements per day in the worst case month of construction which equates to 7.4 trips per hour (3.7 inbound trips and 3.7 outbound trips). This effect is not considered to be significant.

112. Cumulative traffic effects associated with the construction phase of the SHETL Project have been considered. If both projects were to be constructed at the same time, then an additional 50 heavy goods vehicle movements per day would be added to the overall worst case trip generation. This effect is not considered to be significant.

113. Traffic generated during the operational and decommissioning phases would be minimal and would not give rise to any significant effects.

14 SOCIO-ECONOMICS, TOURISM AND RECREATION

114. An assessment of the effects of the Project upon the socio-economics, tourism recreation resource has been undertaken.

14.1 SOCIO-ECONOMICS

115. The effects of the construction phase of the Project on employment opportunities arising is considered to be of moderate positive significance. This is significant in terms of the EIA Regulations.

116. A cumulative effect of moderate positive significance is also predicted during the construction phase of the Project in combination with the SHETL Project. This is considered to be significant.

117. The predicted effect of the Project on employment during the operational phase is assessed as being of negligible significance. This is not considered to be significant.

118. A predicted cumulative effect of negligible significance arises when the Project is assessed alongside the SHETL Project. This is not considered to be significant.

14.2 TOURISM AND RECREATION

119. As effects on tourism are considered to derive from landscape and visual impacts which have been described in Section 8 of this NTS for key tourism receptors such as the Isla Way and National Cycle Route 1.

120. The effect of the construction of the Project upon recreation is considered to be of minor adverse significance. This is not considered to be significant.

121. A minor adverse effect is predicted as a result of the construction phase of the Project combined with the SHETL Project upon the tourism and recreation resource. This effect is not considered to be significant.

15 OTHER ISSUES

122. An assessment of the effects of the Project upon other issues not covered elsewhere in the ES. A desk based assessment has been undertaken. This assessment examines the effects upon the following:

- Gas Pipelines;
- Electrical Infrastructure;
- Water and Wastewater Infrastructure;
- Telecommunications;
- Electromagnetic Fields;
- Health and Safety; and
- Air Quality.

123. This assessment has concluded that there are no unacceptable effects upon any of the aforementioned matters during the construction, operational or decommissioning phases.

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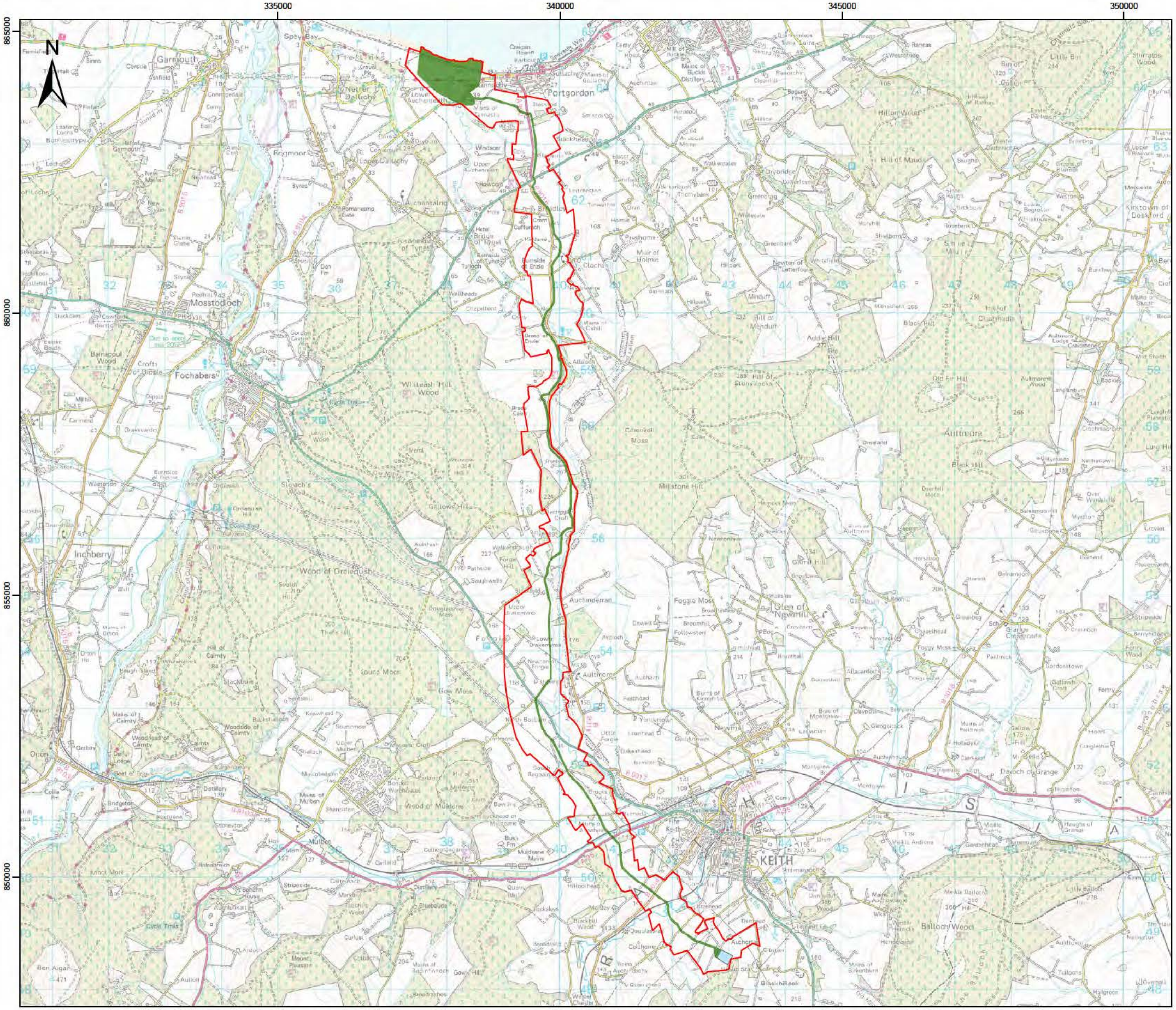

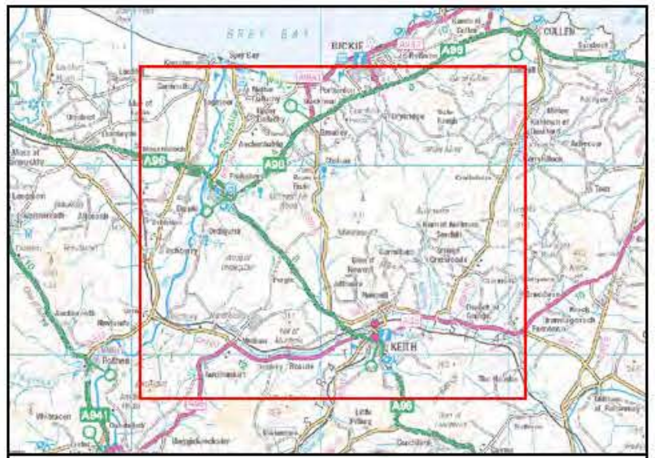

Legend

- Project Red Line Boundary
- Landfall Area & Indicative Cable Corridor
- Substation Footprint

0 1 2 4 km

UK Offshore Development

NTS Figure 1

Onshore Transmission Works Location Plan

Drawn	MM	Checked	RS	Approved	RS
Date	13/09/2012	Scale	1:70,000 @ A3		
Drawing Number	BEA-MAP-ONTW-BOWL-303			Revision	02
Datum	OSGB36	Projection	BNG		

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File ref: E:\GIS_Scottish\Projects\Beatrice\mxd\ES\ONSHORE\NTS\BEA_MAP_ONTW_BOWL_303_Location_Plan _NTS_1_v02.mxd

343000

849000

N

148m

141m

142m

Track

Denhead

Auchorties

Track

Track

Track

Track

Track

Gibston

Little Gibston

El Sub Sta

Blackhillock

Blackhillock Croft

Legend

- Substation Footprint
- Indicative Cable Corridor
- Access Road Option A
- Access Road Option B
- Proposed SHETL Substation Compound

0 50 100 200 m

UK Offshore Development

NTS Figure 2

Cumulative Substation Layout

Drawn: MM	Checked: RS	Approved: RS
Date: 18/09/2012	Scale: 1:5,000 @ A3	
Drawing Number: BEA-MAP-ONTW-BOWL-304		Revision: 01
Datum: OSGB36	Projection: BNG	

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File ref: E:\GIS_Scottish\Projects\Beatrice\mxd\ES\ONSHORE\NTS\BEA_MAP_ONTW_BOWL_304_Cumulative_substation_layout_NTS_2_v01.mxd