Your Energy

ENVIRONMENTAL STATEMENT ADDENDUM

WEST WIGHT PROJECT

Isle of Wight

August 2006

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1. Foreword

Background

1.1 On the 26 May 2006 the West Wight wind farm planning application was submitted by Your Energy Limited (YEL) to the Isle of Wight Council (IoWC). The planning application is for six wind turbines and ancillary infrastructure. This includes the turbine structures, crane pads, a meteorological mast, switching station, underground cabling and temporary and permanent access roads.

1.2 Once the application was submitted, the IoWC undertook a full consultation exercise. The public, interested organisations, statutory consultees and specialists within the IoWC were able to comment on the ES and other submitted documents.

1.3 The comments received by the IoWC were compiled and forwarded to YEL. The comments received relating to the planning application highlighted the need for clarification of various points made in the document.

Purpose of this Addendum

1.4 The purpose of the Addendum is to address the comments raised by the IoWC on behalf of the public and consultees by providing supplementary background information that supports the conclusions reached in the environmental impact assessment process. This document is the result of discussions and dialogue between IoWC and YEL, and its aim is to assist the planning authority in making a decision on the application based on all relevant and correct information.

1.5 The proposal for six turbines as set out in the original planning application and ES has not been amended, and it should be stressed that no new issues are raised in this Addendum.

Structure of the Addendum

1.6 The Addendum answers first those questions concerning how recent developments in planning policy relating to renewable energy are relevant to statements made in the planning supporting statement (SS) of the application. The remainder of the Addendum refers to information included in the environmental statement (ES) and follows the same structure as the submitted document. The information provided here is in response to the IoWC's comments. In some cases new figures, tables or supplementary text have been provided, or alternatively the original text has been included with relevant modification. Each of the individual sections explains the context and reasons for providing clarifying information. Cross-referencing with the ES has been included where appropriate to show precisely how the changes relate to the original document.

The planning supporting statement

2. Planning policy context

2.1 Paragraph 3.3 of the SS refers to the 2003 Government White Paper *Our Energy Future - Creating a Low Carbon Economy*. In January 2006 the Government announced a review of the White Paper through a consultation document entitled *Our Energy Challenge*, but this was not referred to in the SS as no further public announcements had been made. Since the submission of the planning application, however, there has been progress on the review, and an interim report entitled *The Energy Challenge* was published in July 2006.

2.2 This is not a revised Energy Review to take the place of the 2003 document: that will be published at the end of 2006 or in early 2007. This document sets out the results of the consultation exercise that will inform the Review when it is published. However, the report contains material information, and a formal statement on renewable energy.

2.3 Chapter 5 of *The Energy Challenge* deals with the mix of different forms of generation, and the section starting at paragraph 5.16 specifically considers the renewables sector. Paragraph 5.58 deals with planning issues, noting that for on-shore wind proposals securing planning permission can be an especially difficult process with developers facing much uncertainty and a significant risk of delays.

2.4 The Government's intentions in relation to planning issues are set out at the beginning of section 7, in particular in paragraph 7.6, where the factors relevant to the consideration of a planning application are set out. These include:

- the wider benefits of a proposal are not visible within the locality, and local opposition can be strong - as is the case for this proposal
- there is a lack of a clear Government policy identifying strategic need
- there is a lack of time limits within the process, and the lack of such a framework inhibits decision-makers, especially planning Inspectors, from reducing time spent by limiting issues for consideration.

2.5 The need for a national planning framework for energy projects is identified, and for "radical, joined-up action": it is clear that the intention is for the forthcoming White Paper Review to include proposals for fundamental changes to the planning system.

2.6 While that is for the future, and the existing White Paper remains in place, the Government has felt the need for greater clarity on the strategic issues relating to renewables to be provided now. Accordingly, a statement of need has been included in *The Energy Challenge* as Annex D, reproduced below in box 1. This is to be used as a material consideration alongside PPS22. The last two paragraphs of Annex D are directly relevant to this proposal.

We remain committed to the important role renewables have to play in helping the UK meet its energy policy goals. In this publication we are reiterating previous commitments we have made, not least in the 2003 Energy White Paper and Planning Policy Statement 22 on renewable energy (PPS22), on the importance of renewable generation and the supporting infrastructure. We intend this to reconfirm the UK Government policy context for planning and consent decisions on renewable generation projects.

As highlighted in the 2006 Energy Review report, the UK faces difficult challenges in meeting its energy policy goals. Renewable energy as a source of low-carbon, indigenous electricity generation is central to reducing emissions and maintaining the reliability of our energy supplies at a time when our indigenous fossil fuels are declining more rapidly than expected. A regulatory environment that enables the development of appropriately sited renewable projects, and allows the UK to realise its extensive renewable resources, is vital of we are to make real progress towards our challenging goals.

New renewable projects may not always appear to convey any particular local benefit, but they provide crucial national benefits. Individual renewable projects are part of a growing proportion of low-carbon generation that provides benefits shared by all communities both through reduced emissions and more diverse supplies of energy, which helps the reliability of our supplies. This factor is a material consideration to which all participants in the planning system should give significant weight when considering renewable proposals. These wider benefits are not always immediately visible to the special locality in which the project is sited. However, the benefits to society and the wider economy as a whole are significant and this must be reflected in the weight given to these considerations by decision makers in reaching their decisions.

If we are to maintain a rigorous planning system that does not disincentivise investment in renewable generation, it must also enable decisions to be taken in reasonable time. Decision makers should ensure that planning applications for renewable energy developments are dealt with expeditiously while addressing the relevant issues.

PPS22 makes clear that regional planning bodies and local planning authorities should not make assumptions about the technical and commercial feasibility of renewable energy projects, and that possible locations for renewable energy development must not be ruled out as unsuitable in advance of full consideration of the application and its likely impacts. Planning policies, in Regional Spatial Strategies and Local Development Documents, should not place unjustified restrictions on renewable developments; they must be flexible to cope with technological and other change over time.

However, there will be certain areas with more readily available access to renewable resources that will be more attractive for developers, for example, where wind speeds are greatest. As such, as we increase the level of renewables, in line with our energy policy goals, there will be occasions when proposals are received for renewables projects that are located closely enough together potentially to have cumulative impacts. Decision makers will have to work closely together with statutory advisers, such as English Nature, to consider the handling of assessments of the cumulative impact of such proposed developments. Cumulative effects, like the impacts of individual projects will not, however, necessarily be unacceptable or incapable of reduction through mitigation measures.

Box 1. Annex D of *The energy challenge*

Environmental statement

3. Non-technical summary

3.1. Paragraph NTS11 and corresponding NTS table 1 were included in the ES to provide a context for the surrounding properties in relation to the positions of the proposed turbines. This information was provided to support the description of the application site, and not as part of a formal assessment. The IoWC raised questions regarding the absence of Prospect Cottage in the original table. This is acknowledged and has now been rectified on the table and figure included here.

3.2. The table below substitutes NTS table 1, and it shows all the closest properties to each of the turbines. It also shows properties that were selected as being representative of groups of properties in the surrounding area. It can be seen from the table that no property is closer to the turbines than Churchill Farm, which was included in the original work.

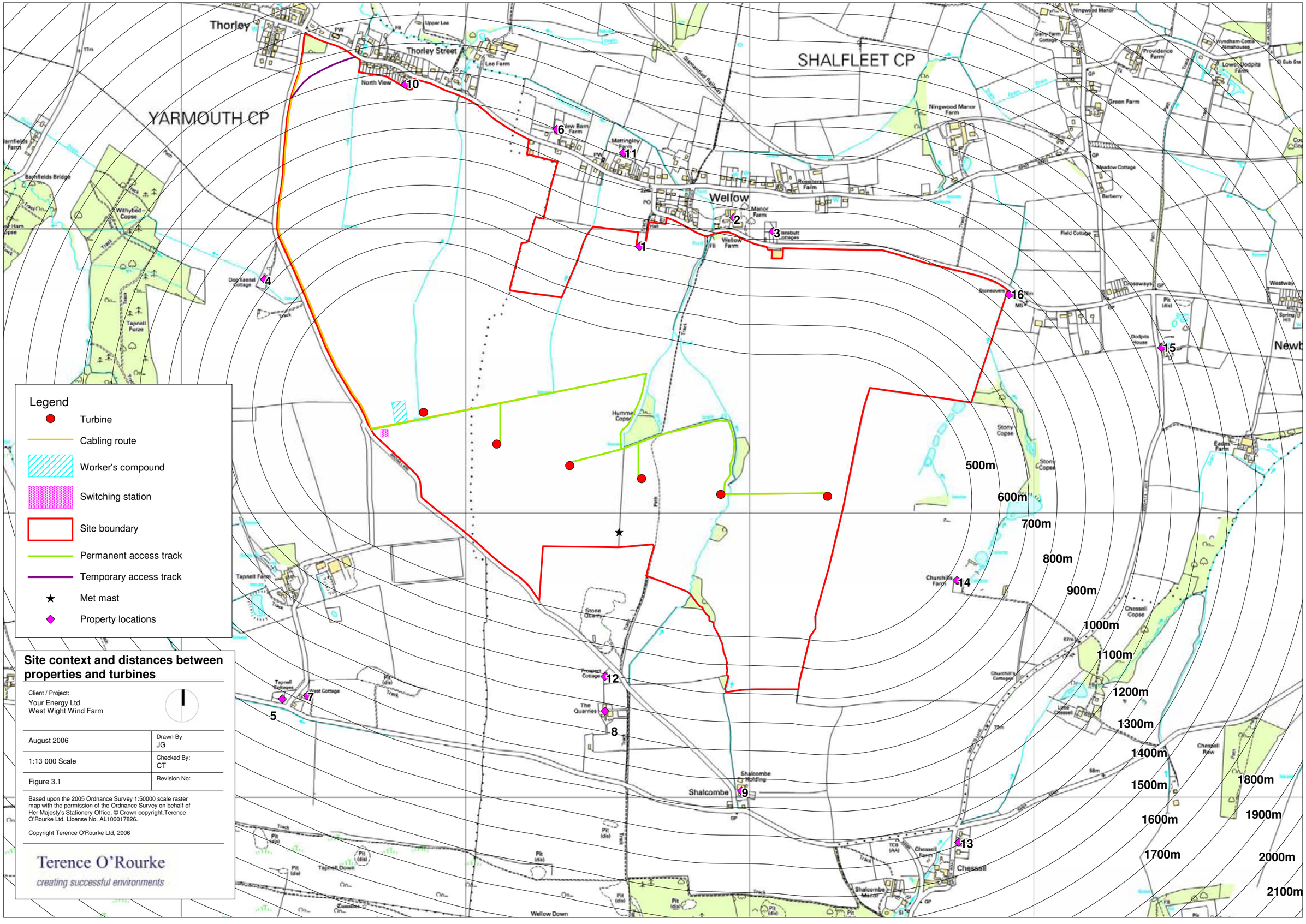
Property name	Turbine number	Distance (m)
Hartshole Cottage	T3 T4	820 830
Manor Farm	T3 T4	1,040 990
Danesbutt Cottages	T4 T5 T6	990 950 960
Dog Kennel Cottage	T1	720
No. 8 Tapnell Cottage	T1 T2	750 900
New Barn Farm	T1 T2	1,070 1,080
West Cottage	T1 T2	1,080 1,100
The Quarries	T3 T4 T5	880 840 870
Shalcombe	T5 T6	1,040 1,050
North View's closest property	T1	1,140
Mattingley Farm	T2	1,110
Prospect Cottage	T3 T4 T5	750 710 760
Chessell Pottery	T6	1,300
Churchill Farm	T6	550
Dodpits House	T6	1,280
Stoneovers	T6	960

Table 3.1: distances between neighbouring properties and turbines

3.3. To ensure that no properties on the site layout plan (figure NTS2) were missed, Addendum figure 3.1 (provided at the end of this chapter) shows concentric rings at certain distances from the line of turbines.

3.4. It was requested by the IoWC that the meteorological mast is included on plans in the ES. Figure NTS2 is therefore modified with this change as shown in figure 3.2 of this Addendum.

3.5. Figure NTS 3 is replaced by figure 3.3 of this Addendum. This figure shows the proposed routes for construction vehicles overlaid on an Ordnance Survey base rather than a schematic drawing as provided in the original ES. Further detail is provided in the traffic and transport section of this Addendum (chapter 16).



Legend

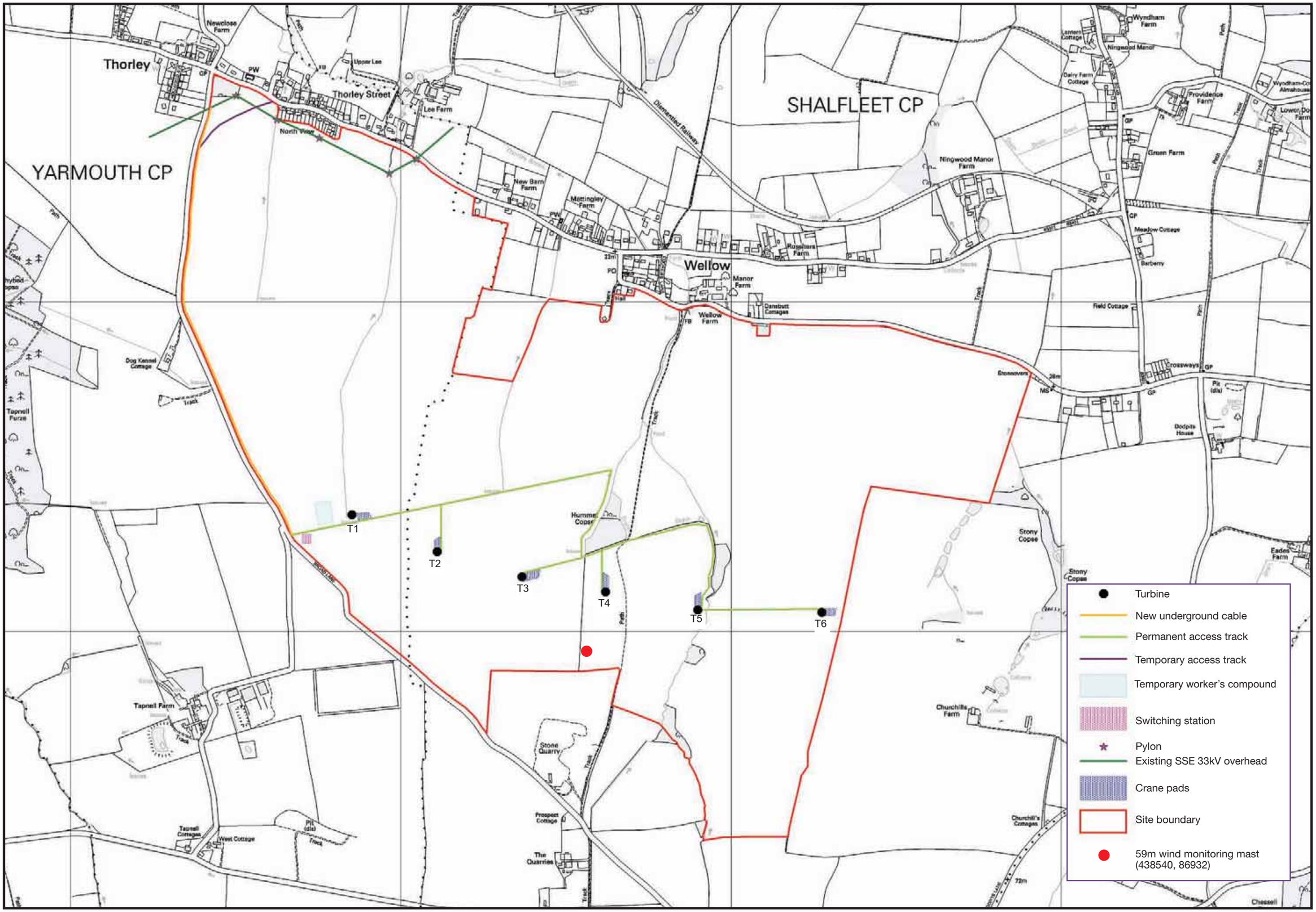
- Turbine
- Cabling route
- Worker's compound
- Switching station
- Site boundary
- Permanent access track
- Temporary access track
- Met mast
- Property locations

Site context and distances between properties and turbines

Client / Project:
Your Energy Ltd
West Wight Wind Farm

August 2006	Drawn By: JG
1:13 000 Scale	Checked By: CT
Figure 3.1	Revision No:

Terence O'Rourke
creating successful environments


YARMOUTH CP
SHALFLEET CP
Thorley
Thorley Street
Wellow
Newclose Farm
Upper Lee
Lee Farm
North View
New Barn Farm
Mattingley Farm
Manor Farm
Wellow Farm
Danebutt Cottages
Roosters Farm
Ningwood Manor Farm
Wyndham Farm
Ningwood Manor
Lantern Cottage
Dairy Farm Cottage
Providence Farm
Green Farm
Meadow Cottage
Barberry
Field Cottage
Crossways
Dodpits House
Eades Farm
Stoneovers
Dismantled Railway
Dog Kennel Cottage
Tapnell Furze
Tapnell Farm
Tapnell Cottages
West Cottage
Stone Quarry
Prospect Cottage
The Quarries
Hummer Copse
Stony Copse
Churchills Farm
Churchill's Cottages
T1
T2
T3
T4
T5
T6
Turbine
New underground cable
Permanent access track
Temporary access track
Temporary worker's compound
Switching station
Pylon
Existing SSE 33kV overhead
Crane pads
Site boundary
59m wind monitoring mast (438540, 86932)

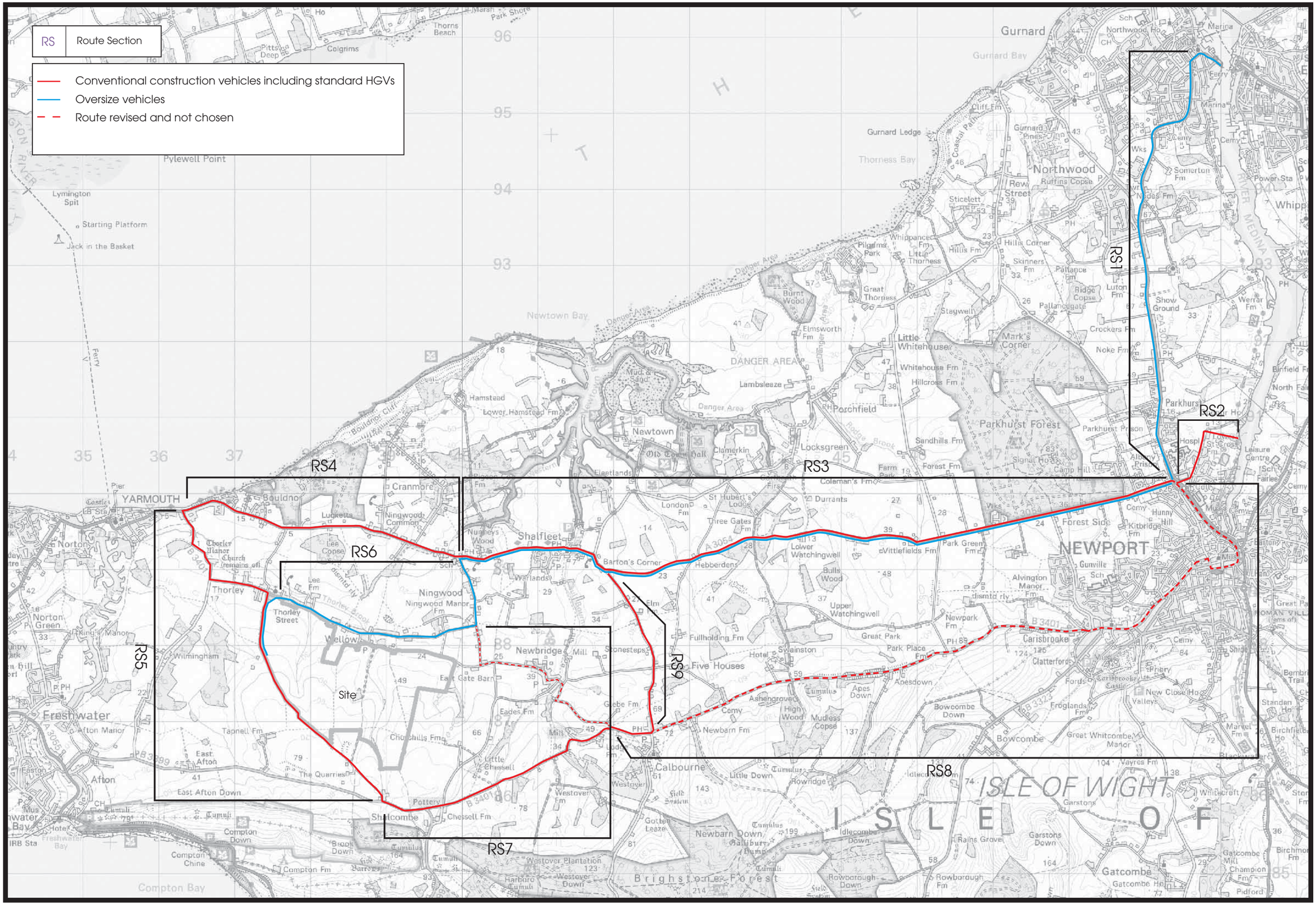


Figure 3.3 : Proposed vehicle routing in local road network

4. Introduction

4.1 No clarifying information requested.

5. Alternatives

Development of the wind farm design

5.1 The IoWC has requested further explanations regarding the development of the wind farm design. The following areas are discussed in this chapter.

a) How the applicant has sought to minimise the landscape and visual impacts of the wind turbine locations.
b) How the applicant has sought to minimise the landscape and visual impacts of the access tracks.
c) The justification of a tip height of 100m and whether there has been any consideration of a lower height.
d) Justification for the location of the site outside of the AONB, bearing in mind the impact that there is within the AONB.
e) Information on the impact of the wind farm being used by Vestas for R&D purposes.

Minimising the landscape and visual impact of the wind turbines

5.2 The design of a wind farm is an iterative process, which aims to balance all of the technical, commercial, environmental and planning requirements. The West Wight project has been under development for more than six years and has been subject to a number of scoping studies and consultations. During this time the design has evolved to take account of the many concerns and comments raised during this process.

5.3 Having selected the Vestas V82 as the preferred wind turbine for the Project (see below for details of the turbine selection process) the wind farm layout design sought to implement all practical means possible to reduce the impact to a minimum, whist also attempting to utilise as much of the site as possible for the generation of renewable energy.

5.4 The wind farm layout and the number of turbines that can be installed at the West Wight site is governed by the following factors.

- the requirement to maintain minimum distances between adjacent turbines
- noise constraints at properties adjacent to the site
- the preference to align the turbines at right angles to the dominant prevailing wind.

5.5 In the context of these technical constraints, the final layout sought to minimise the landscape and visual impact by:

- reducing the distance between the turbines to minimise the overall length in the landscape, especially when viewed from locations perpendicular to the alignment
- regularly spacing turbines of a uniform size, height and colour to avoid visual discordance and to achieve a simple, controlled and legible layout when viewed in the landscape
- aligning the turbines to roughly follow the 'grain' of the gently shelving landform of the Open Farmland landscape unit
- using fewer larger turbines in preference to a greater number of smaller ones, which, as well as the technical reasons noted later, was also considered to achieve a more simple and harmonious image in the context of the open and large-scale landscape of the site.

Minimum spacing required between turbines

5.6 From a technical perspective the minimum ideal spacing between adjacent wind turbines are four rotor diameters at right angles to the prevailing wind direction and six rotor diameters in the same direction as the prevailing wind direction. Often, especially on smaller schemes, there are constraints that make achieving this minimum spacing impossible; such tighter groupings will result in a reduction in the energy capture of the project due to turbulence (known as array losses) and increased loading on the turbines.

5.7 The location of the properties around the site and the dominant south west prevailing wind direction leads to an optimum wind farm design consisting of a line of turbines oriented north west to south east.

5.8 An early wind farm design proposed 6 turbines in a line with a total length of 2.1 km between the turbines at each end.

5.9 The final design of the wind farm (as proposed) sought to reduce the landscape and visual impact by reducing the distance between the turbines to an absolute minimum that would be technically acceptable. The result is a more compact layout with the total distance across the layout reduced to 1.4 km (a reduction of one-third).

5.10 Energy production from the wind farm is slightly lower because of this more compact layout, although this loss of environmental benefit is easily outweighed by the landscape benefit derived from the 33% reduction in the overall length of the scheme. The reduction in the energy production referred to here has already been accounted for in the energy production estimates provided elsewhere in the ES for the West Wight project.

Noise constraints

5.11 Keeping predicted noise levels well within agreed limits is the overriding technical consideration for any wind farm layout, where there are sensitive receptors in the vicinity. The Sound Power Level (Lw) of each turbine is used to calculate the total noise level at each of the nearby-inhabited properties to ensure that the predicted noise level does not exceed the ETSU-

R-97 recommendations under any operational conditions of the wind farm. The West Wight site is surrounded by inhabited properties, which imposes significant constraint on the turbine layout.

5.12 For the Vestas V82 turbine under consideration for this project (see paragraph 5.21 below) a cluster layout (turbines arranged in a group rather than in a linear formation) is not feasible. This is because in order to satisfy the distance requirements for the efficient generation of electricity the location of the turbines would result in noise limits being exceeded at nearby residential properties.

Alignment of turbines perpendicular to the wind

5.13 The wind direction for the West Wight project has a very dominant component from the south west. Ideally the turbines would be placed in a north west / south east alignment.

5.14 As a result of layout modifications which placed the turbines closer together (refer to section 5.2 above), and also the requirement to ensure full compliance with noise limits, the final layout of the West Wight project has the turbines aligned more in an east west direction. This final layout is not optimum from a purely technical perspective but given the importance of the landscape and noise issues it is considered a balanced and satisfactory solution. From a turbine operation viewpoint this layout has been reviewed and accepted by Vestas.

Fewer number of turbines

5.15 In early wind farm layouts it was considered that there was potential on the site for at least seven turbines. However, the proposed layout placed one turbine out of alignment with the others in order to satisfy noise constraints. This layout was considered very undesirable from a landscape point of view and the turbine was subsequently dropped from the proposal.

Minimising the landscape and visual impact of the access tracks

5.16 The visual impact of the access tracks has been reduced as far as is practicable in accordance with the following considerations:

a) Where possible, the access track layout and alignment follows existing tracks and field boundaries. The requirements of the landowner are of significant importance in this respect for ongoing farming operations.
b) Where access is only required for construction, temporary access tracks are specified with re-instatement following completion of construction. In addition, the running width of the 5m construction roads will be reduced to 3m following completion of construction.
c) The access track will be surfaced using a locally sourced aggregate, its colour chosen to reflect the local area and to minimise its visual prominence in the landscape.

Selection of the preferred wind turbine model

Background

5.17 Wind turbine development has progressed rapidly over the last 15 years. In 1990 a typical commercial turbine was rated at 300kW with a rotor diameter of 30m and tip height of 40m. By 1996 many projects in the UK were using 500 to 600kW turbines with rotor diameters of 40 to 50m, and in Germany 1.5MW turbines were being installed with rotor diameters of 60m and tip heights of 100m and higher.

5.18 This rapid development was driven by the improved economics of larger turbines and technological advances, but also because there was increasing evidence that fewer, larger turbines resulted in a lower environmental, archaeological and ecological impacts overall.

5.19 In addition, the energy capture of a turbine is improved by increasing the tower height (and therefore the tip height) because the wind speed also increases with height. The difference in wind speeds between ground level and at height is known as the wind shear effect. This effect is particularly important on sites such as West Wight where the difference in the wind speed at ground level and at turbine height may be greater.

5.20 The West Wight Project was started in 1999 by Vestas Blades (at that time called NEG Micon Rotors) as a way of obtaining access to operational wind turbines for its R&D Engineers and also providing a showcase for it new 41m blade specifically designed for the Vestas V82 turbine. At this time the Vestas V82 was still in the prototype/preproduction stage.

Selection of the Vestas V82 wind turbine for the project

5.21 Because of the link between the project and the Vestas Blades business, the primary selection criteria was

a) That the turbine installed at the site should be a Vestas product. *The Vestas V82 continues to be a very popular and commercially successful product in the Vestas range.*

b) The blades for the turbine should be manufactured on the Isle of Wight. *The V82 turbine blades are made exclusively at the Isle of Wight Newport factory.*

5.22 There are also technical reasons why the Vestas V82 has been selected as the preferred turbine.

a) The Vestas V82 is designed specifically for low to medium wind speed sites and noise sensitive locations. It is therefore an ideal choice for this site.

b) The 59m hub height version (100m tip height) of the Vestas V82 was developed specifically for the UK. For world markets the V82 turbine is designed for installation on taller towers, typically 78m and above,

resulting in tip heights of up to 120m. In the UK there was, and continues to be, some reluctance towards accepting tip heights greater than 100m. For this reason Vestas developed special ' low' towers for their large turbines. In justifying the R&D investment in the development of shorter towers at the time, the West Wight project was used as a typical example of where a lower tip height for a large turbine was of critical importance.

Consideration of smaller wind turbines

5.23 Smaller wind turbines were considered for the West Wight project, specifically the NEG Micon NM54/950, which is a 950kW turbine. This turbine has a rotor diameter of 54m and a minimum hub height of 44m, giving a tip height of 71m.

5.24 The proposed layout for the project using these smaller turbines resulted in nine turbines in a similar linear layout, giving an installed capacity of 8.55MW and with a consequent lower energy production.

5.25 The use of smaller wind turbines was discounted from further consideration at an early stage in the project development because it became clear that, in the rapidly advancing market, these smaller (older technology) turbines would be of no value to the Vestas R&D Facility. In addition, blades for these smaller turbines are not manufactured at the Newport factory.

5.26 There are however other reasons for selecting the V82 in preference to a smaller turbine, for example:

a) The six Vestas V82 turbines are estimated to produce up to 30% more energy compared to nine NM54/950. The NM54/950 is now out of production but a similar turbine, the Vestas V52 850kW would result in the same conclusion.
b) Smaller turbines (up to 1MW range) generally use older technology, with each turbine producing similar noise levels to a modern, larger turbine. This is an obvious and considerable disadvantage where the layout of the wind farm is constrained by noise limits.
c) Installing fewer turbines reduces the disruption to the landowner and their farming operations. In addition fewer turbine bases and the associated roads reduces the risk of any archaeological damage and potential for bird collisions.

5.27 As noted earlier, it was considered that a greater number of smaller turbines arranged in a similar linear layout would result in a less harmonious arrangement in terms of its fit in the landscape. In views from the north and south, although less high, the turbines would occupy a greater percentage of the overall view and the increased number of turbine towers and blades would emphasize the overall massing of development. Reducing the number of the smaller turbines to six or seven was considered, but this arrangement was ruled out principally because of the resultant major reduction in energy production, and because it would was considered to significantly under

utilise the potential of the site. Importantly, it was also concluded that the unacceptable reduction in energy production would not be compensated by a corresponding landscape and visual benefit, with many of the representative viewpoints assessed, and in particular those from the adjacent AONB landscape of the chalk downs, still experiencing a significant adverse impact despite the reduction in tip height.

Consideration of larger wind turbines

5.28 The largest turbine considered during the project development process was the NM92/2750 turbine, which has a minimum hub height of 78m and tip height of 124m. At the time the West Wight Project was conceived this turbine was still 'on the drawing board' (the first prototype was installed on Orkney Island in 2002).

5.29 Larger wind turbines were discounted from further consideration at an early stage in the project, principally because the initial results of scoping indicated that this size of turbine would be unacceptable at this location from a landscape and visual impact point of view. Further discussion is provided in chapter 11 of this Addendum on the ability of the island to assimilate the size of the proposed turbines.

Restricting the tip height to 100m

5.30 The towers proposed for the West Wight wind farm are the shortest available for the Vestas V82 turbine, giving a hub height of 59m and a tip height of 100m. Although the energy capture of the project would increase if higher towers were specified, it has been recognised that it is preferable to keep the tip height as low as practicable for landscape and visual impact reasons.

5.31 However, it is proposed that two of the six turbines will be erected on higher towers (68.5m hub height) in order to compensate for the varying ground levels over the site. This has been done purely for visual impact reasons on the advice of landscape architect consultants and is not necessary for technical reasons.

Selection of the site outside of an AONB

5.32 Although national planning policy does not prevent the development of wind turbines in AONBs, paragraph 22 of PPS7 advises that major developments should not take place in AONBs except in exceptional circumstances. Furthermore, in determining applications for major development, paragraph 22 of PPS7 states that consideration should be given to the cost of and scope for such a development taking place outside the designated area.

5.33 Therefore, as national planning policy guidance clearly favours the development of non-designated areas ahead of designated areas, the decision to favour development on a non-AONB site ahead of an AONB site is justified.

Alternatives

5.34 As set out in the alternatives site selection process, a series of steps were followed as part of that methodology. Following the second site-sieve, five additional search areas were identified. Two of the sites were omitted because they were of insufficient size, leaving West central Isle of Wight (West Wight), Bleak Down and Bowcombe Down / Rowridge to be considered further. Part of the detailed investigation of the three remaining sites included a landscape assessment, focusing on potential visual effect and landscape character.

5.35 The landscape assessment concluded that whilst the AONB status was not considered an overriding constraint, the site without the designation (West Wight) must be considered located in a less sensitive landscape.

5.36 In terms of visibility, it was concluded that the two sites that take advantage of the abrupt visual thresholds within the topography of the island (West Wight and Bleak Down) could be expected to have less extensive ZVIs than that of Bowcombe Down / Rowridge. Additionally, although the ZVI analysis did not identify the potential significance of receptors, it was clear that for Bowcombe Down / Rowridge large sections of AONB landscape would be affected. Whilst visual thresholds limited the potential visibility of Bleak Down and West Wight alike, for the former its location within the AONB determined that it only partially met the criterion.

5.37 In respect to landscape character, the landscape of West Wight was determined to be less intact, generally exposed and lacking vegetation cover, of moderate condition and not inherently sensitive to change. Unlike the other two sites, which were located within the more sensitive AONB landscapes, the West Wight site therefore met the criterion for landscape character.

5.38 The results of the detailed assessment are summarised in the Alternative Sites Summary Matrix (figure 2.17 of ES Technical Appendix A).

The use of the wind farm by Vestas R&D

5.39 As part of the post-submission consultation, the Managing Directors of Vestas Technology UK Ltd and Vestas Blades UK Ltd have sent a joint letter to the IoWC explaining in detail why they support of the application for the West Wight wind farm.

5.40 Section 1 of the letter sets out how the wind farm will benefit Vestas' business, and indeed the critical nature of nearby operational wind turbines to its continued success in the highly competitive wind turbine supply market.

5.41 Section 2 sets out some specific examples of how the turbines on the wind farm could be used by Vestas for training and for R&D activities. The anticipated additional impact of these activities over and above the regular

operations and maintenance are described in Section 9.93 of the Environmental Statement.

The following is an extract from the letter to IoWC, dated 11 July 2006:

In 2007 Vestas Blades UK will manufacture over 1,000 blades, all of which are exported to other countries. Although the 18 blades required for the West Wight project would be a small proportion of the annual production, their use in the UK, and in particular on the Island, is of considerable significance.

There are two main reasons for Vestas' business interest in this project: -

1. All of the blades made at the Newport factory are for onshore wind farms

- Vestas is building blade factories in all of our large markets, which are presently supplied with wind turbine blades from the Newport Factory. In the future our business will depend on a local UK, Irish and French on-shore market. The Newport factory is too small for the offshore market and so the West Wight project is typical of our future business opportunities.
- Over 500 direct jobs and an equivalent number of indirect jobs on the Island rely on enough of these onshore projects being constructed (the blade production output of the Newport factory is over 300 turbines per year)
- Vestas employees take great pride in their work and our products, which are used, all around the world. Many of our team on the Isle of Wight have not seen an operational wind farm (our nearest blades are in Spain or Germany) It would be extremely beneficial for them to be able to visit and be associated with a live project here on the Island using Vestas blades in terms of morale and general understanding of the business they work in.
- There would be a significant marketing benefit for existing and potential customers to be shown around a live project while visiting the factory. The Island would be used by Vestas to host many more major clients, Shell, BP etc. The benefit of these visits would extend beyond Vestas.
- Some of our training needs require visits to operational wind turbines - a local turbine would facilitate this and increase the capability of our engineering and service teams.

The Island decision will be watched closely by many other local decision makers that do not have anything like the economic benefit at stake on the Island, when considering their local wind farm applications.

2. Access to local wind turbines assists essential Research and Development activity

- Since the opening of the Vestas Blades Factory the advantage of having easy and quick access to operational wind turbines has been recognised. Effort to find a suitable site for a wind farm on the Island was started by Vestas (then NEG Micon) in 1999 with the project development transferred to Your Energy Ltd with the understanding that - (a) Vestas turbines will be used for the project, and (b) access to the turbines would be available for Vestas personnel.
- Vestas Technology UK is the blade Research and Development arm of Vestas. This team developed the wood carbon technology that has now been adopted by Vestas as its future technology, and we are now exporting this technology. We must remain in the lead in order to justify the Newport R&D facility.
- The focus of our work is moving from a manufacturing technology towards including much more aerofoil concepts and 'intelligent blade concepts'. In this area of research the main proving ground is on a turbine. This team is at a

disadvantage in comparison with all others in Vestas that are within a short distance of a turbine.

- To illustrate the importance of the above two points, Vestas has announced that it will set up an R&D base for 120 engineers in Singapore. A key requirement of this new facility is that a wind turbine test station is part of the agreement. Singapore will supply the land for free for this because they are so keen to have such a knowledge base. They understand what knowledge centres require and the value they bring. They understand that renewable technologies are one of the future growing business areas globally. Our hope is to help the Isle of Wight keep and grow our knowledge centre, which today is a world leader.
- Some of the specific R&D projects that we will be able to undertake on the Island if we have access to a turbine include:

  - Exploration of new sensor technology including fibre optic load and failure sensing
  - Development of accelerometer rotor balancing to reduce loading
  - Leading edge materials that stay clean and so improve performance
  - Lightning sensor technology
  - Load monitoring under different blade control strategies
  - Power performance enhancers that modify how an aerofoil works

All of these projects can be undertaken on an operational wind turbine and would not require regular major construction activity at the site.

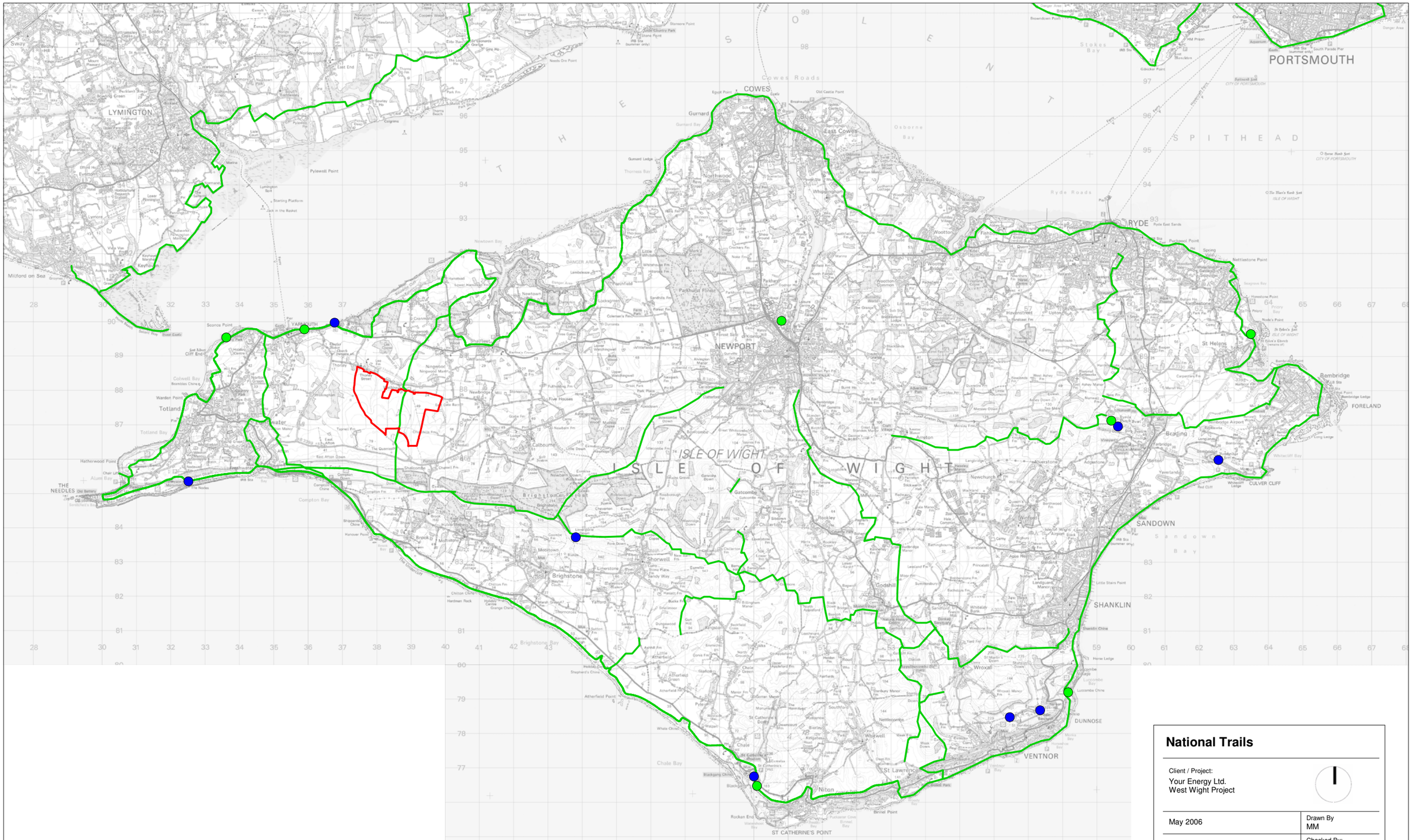
Without a nearby turbine, R&D projects such as these (and the knowledge that is developed with them) will inevitably shift towards Denmark and the new facility in Singapore.

In summary, having Vestas wind turbines close to the Vestas Technology Centre would be of considerable benefit to our business and in our view is of vital strategic importance to the on-going success of the Vestas businesses on the Island.

Setting up Vestas was an important element in the creation, of the St Cross Business Park and its designation as an enterprise hub and centre of excellence for composites. We gratefully acknowledge the support we have received from SEEDA and other Government agencies in helping to create this successful business and we are very keen to ensure that innovative manufacturing and R&D in composites remains on the Island.

Modification to the ES

5.42 An error was identified in figure 2.6a of the West Wight ES technical appendix A (Alternatives). This has been replaced by figure 5.1, which appears at the end of this Addendum chapter.



Legend

- Picnic Sites
- Viewpoints
- National Trails
- Site Boundary

National Trails

Client / Project:
Your Energy Ltd.
West Wight Project

May 2006	Drawn By: MM
1:105,000 Scale	Checked By: MGM
Figure 5.1	Revision No:

Terence O'Rourke
creating successful environments

6. Site description

6.1 The information requested by the IoWC for the site description chapter concerns table 3.1 and the distances provided between residential properties and the proposed turbines. This issue has been addressed in chapter 3 of this Addendum as the same table appears as NTS table 1.

7. Proposals

7.1 It is critical for any proposed development to have a clear and unambiguous description of the development where the information is required and indeed available. The IoWC has identified some parts of the proposals chapter that may be enhanced by improved clarity in the text. To this end the follow paragraphs have been provided.

Crane pads

7.2 The issue of crane pad construction design was raised, particularly in relation to paragraph 4.2 of the ES. This paragraph states that the crane pads will be surface mounted and seeded with an appropriate seed mix after construction to minimise visual impacts.

7.3 The crane pad design is similar in cross-section and construction (albeit a larger area) to the permanent access tracks required for the proposals and will comprise compacted crushed roadstone. Like the permanent access tracks, it is semi-permeable to minimise any effects due to runoff. The crane pad edges will be similar to the verges of the access tracks; they will be profiled and sloped from the existing ground surface to the top of the crane pad surface which will be approximately 0.45m. Following the completion of construction the crane pad areas will be covered with topsoil and seeded.

Lighting

7.4 During the normal operation of the wind farm there will be no permanent lighting on-site.

7.5 Low voltage lighting will be provided around the switching station, which will be manually switched from inside the substation when required.

7.6 The turbines will not be lit externally and do not require aircraft warning lights.

Underground cabling

7.7 Paragraph 4.17 is modified to state that the electrical connection “will travel underground” rather than “is likely to travel underground”.

7.8 An illustration of a typical connection arrangement that might be used for the West Wight Project to connect to an overhead 33kV line is included at the end of this chapter (figure 7.1). This is provided for information only because the connection from the substation to the existing 33kV in the north east corner of the site is subject to a separate planning application, which will be submitted by the local network provider (SSE).

Stream crossing

7.9 The proposals require a permanent access track to cross the small stream that is located between turbine 5 and turbine 6. Information on the stream crossing design has not been determined at this time as it is subject to agreement with the Environment Agency (EA) before construction. The crossing will be designed in accordance with CIRIA [1]best practice guidance, and the type of crossing method will be based on the sensitivity of the stream edges and bed at this location. The crossing is likely to require Land Drainage Act consent from the EA and this places controls on the design of the crossing. This information is referenced in the ES under paragraph 14.50.

7.10 An error was included in paragraph 4.19. The paragraph refers to a loss of a limited stretch of hedgerow, required to allow for site access. Whilst a former hedgebank with rough grass is present, the hedgerow was mistakenly identified. The Phase 1 habitat survey and other site visits have confirmed that there is no hedgerow at any of the access point locations.

Position of the meteorological mast

7.11 The meteorological mast will be required for the 25-year period of the proposal. The mast is fitted with instruments that monitor the wind speed, wind direction, temperature, and pressure. The data collected from these sensors are used to assess the overall and ongoing performance of the wind farm and will also be important for Vestas Blades R&D activities.

7.12 Note that although each wind turbine is fitted with wind speed sensors, these instruments are purely for control purposes and are not accurate when the turbines are operating because they are affected by the turbulence of the rotor.

7.13 The position of the meteorological mast was subject to various constraints. Justification for its final location are as follows:

a) It is close to the edge of a field boundary and therefore has minimum impact on farm operations.
b) With respect to the dominant south westerly wind direction, it is upwind of the general wind farm.
c) It is within four rotor diameters of a wind turbine and therefore satisfies the requirement for power performance testing. As well as being of commercial relevance for the operation of the wind farm, this is an important consideration for the use of the wind farm for some R&D activities by Vestas Blades.

7.14 The meteorological mast was chosen to be a zinc-galvanised lattice structure rather than a guyed structure for three main reasons.

[1] Construction industry research and information association

a) Guyed mast structures are usually used only for temporary installations principally because they do not require permanent foundations and can be installed without a large crane. A major disadvantage with a guyed structure is that they require substantial and regular maintenance. Typically, every 5 years all of the guy wires need to be replaced.

b) On many sites guyed structures are not acceptable because of the likely affect on birds - the wires are very thin and not easily seen. Special 'bird deflectors' - coloured ribbon set a regular distances along each wire - have been tested and are used on temporary meteorological masts, but are not fully proven and need to be replaced regularly.

c) A guyed structure takes up a far larger area of land. A typical 60m guyed met mast would require a 60m footprint (guys spaced out 30m to each side of the base). By comparison, a lattice mast typically requires a maximum 5m x 5m base area for the foundation block.

Electricity grid connection

7.15 There is little information provided on the design for connecting the wind farm to the local electricity grid. This is because consents for the connection will be obtained by Scottish and Southern Electricity (SSE) as a separate planning application. For the purpose of providing an understanding of what the connection might entail, figure 7.1 provided by Econnnect is included at the end of this chapter and shows a typical connection.

Energy output

7.16 The analysis of the wind data and the energy assessment for the West Wight wind farm was performed by Garrad Hassan Partners (GHP). GHP is a leading UK based international wind energy consultancy that has undertaken similar energy assessments on over 30,000 MW of wind turbines worldwide. As well as working for wind farm developers they also provide due diligence services during financial negotiations for wind projects and act as Bank's Engineer. This engineer over-sees construction and ensures that the works are carried out in accordance with the bank's interests.

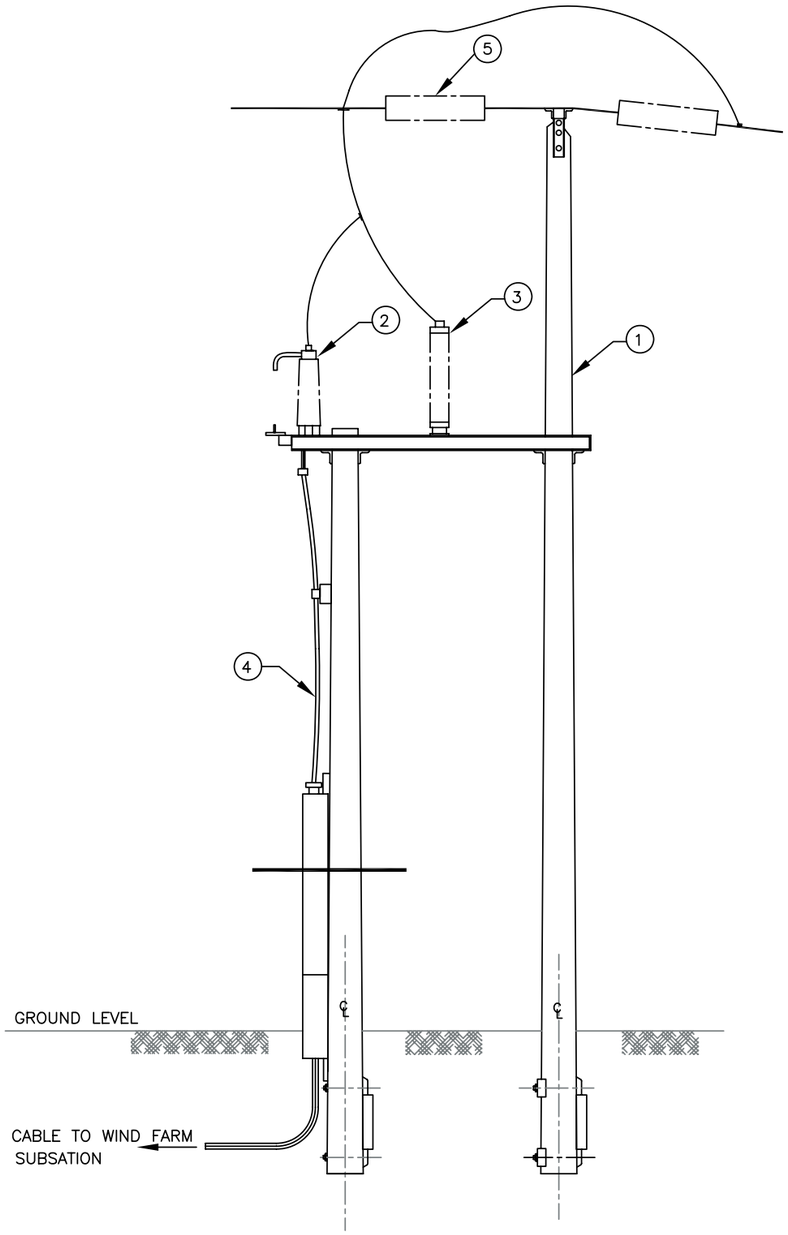
7.17 GHP has undertaken an analysis comparing their predicted energy production for 101 wind farms against the actual production, which was presented at the 2004 European Wind Energy Conference in November 2004. The results of this analysis, which covers 298 wind farm years, shows that actual production has been, on average, 97% of the GHP central estimate. This demonstrates a good level of agreement and validates the approach used by GHP in estimating the energy from wind farms (which is the same technique used for the West Wight Project). As a reference to these data, YEL's Burton Wold wind farm, near Kettering, is currently operating at 97% availability and has an energy output which is 97% of GHP's forecasts.

7.18 It has been reported recently that two of Britain's offshore wind farms, Scroby Sands and North Hoyle, produced less energy than expected. The main reason for this under-performance appears to be low availability because of a substantial amount of unplanned work. Some of this unplanned

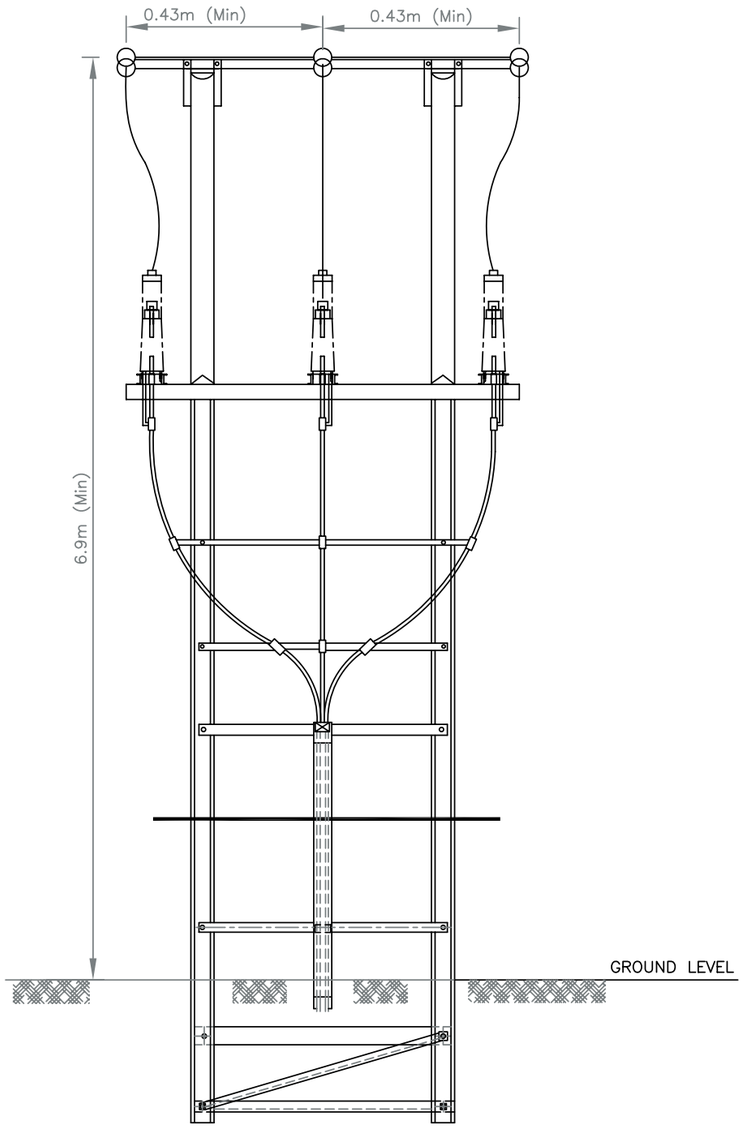
work involved repairs to gearboxes and generators. It should be noted that offshore wind farms are subject to more severe environmental stresses compared to onshore wind farms and maintenance activities are more complicated because they are less accessible. The combination of these factors makes it far more difficult to achieve the 97% and greater availability levels, which are typical (and achievable) for an onshore wind farm.

Modifications to the ES

7.19 The IoWC has requested that the meteorological mast be included on the site layout plan, figure 4.1 of the ES. This appears as figure 7.2 at the end of this chapter.



SIDE ELEVATION



FRONT ELEVATION

REFERENCE DRAWINGS:

SEE DRAWING 1705 / 001

NOTES AND LEGEND:

1. Terminal 'H' Pole
2. Cable Sealing End
3. Surge Diverter
4. Incoming Cable
5. Line Insulator

FOR INFORMATION

DRAWING STATUS:
A - FOR INFORMATION / FOR TENDERING PURPOSES ONLY
B - FOR CLIENT COMMENT / FOR CONNECTION APPLICATION
C - FOR CLIENT APPROVAL / FOR DESIGN
D - FOR CONSTRUCTION
E - AS-BUILT

REV	DESCRIPTION	BY	DATE	CHK'D	APP'D
0	ORIGINAL ISSUE	JG	10/05/06	AED	AED

Econnect
Energy House
19 Haugh Lane Ind Est
Hexham
Northumberland
NE46 3PU UK
Tel : 01434 613600
Fax. 01434 609080

SCALE: N.T.S. ORIGINAL SIZE: A3

TITLE: INDICATIVE TEC CONNECTION TERMINAL POLE

CLIENT: YOUR ENERGY

DWG No: 1705/002 REV: 0

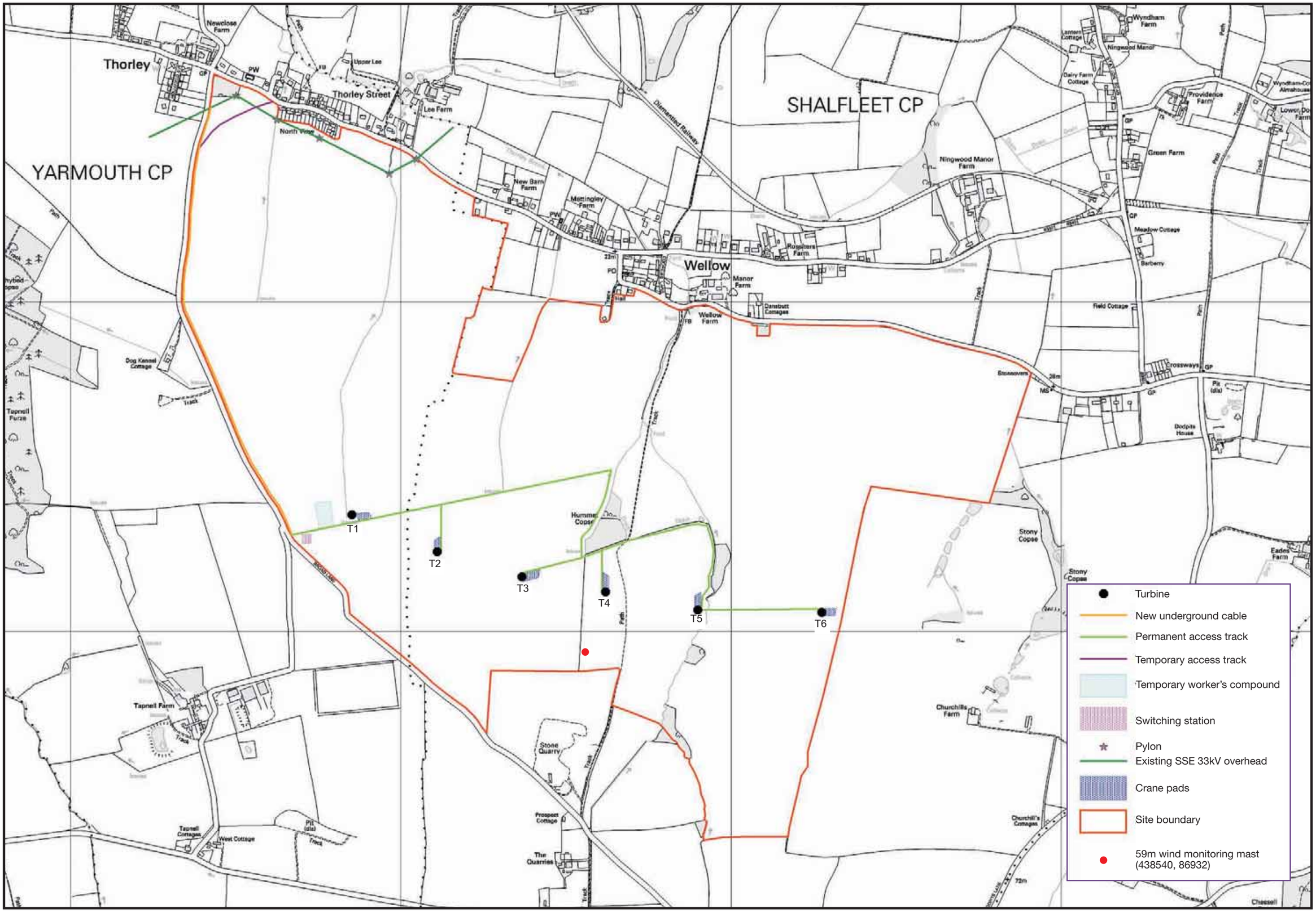


Figure 7.2 : Site layout

8. EIA issues and methodology

8.1 No clarifying information requested.

9. Birds

9.1 Clarification has been sought by the IoWC, English Nature and others on a number of points relating to the birds chapter of the ES.

9.2 In addition, English Nature has requested that the IoWC undertakes an appropriate assessment under the Habitats Regulations 1994 prior to determining the application. This assessment is specifically required to consider the effect of the proposals on golden plover from the Solent and Southampton Water SPA/ Ramsar site (though not specifically named on the citation, the species forms a part of the regular wintering assemblage of the site), and possibly also on migrating passerines and raptors from the New Forest SPA. Further interpretation of the data relating to the relevant species is therefore presented here. References are presented at the end of this chapter.

Clarification of status

a) Annex 1 birds

9.3 Annex I species listed in the Birds Directive are those species that may become extinct, or are rare, or considered vulnerable within the EC and 'shall be the subject of special conservation measures concerning their habitat to ensure their survival and reproduction in their area of distribution.'

9.4 In short, the inclusion of species on Annex I of the EC Directive 79/409/EEC on the Conservation of Wild Birds (The Birds Directive) means the following actions are prohibited:

- deliberate, or reckless, destruction of, or damage to, their nests and eggs, or the removal of their nests
- deliberate, or reckless, disturbance of these birds particularly during the period of breeding and rearing in so far as disturbance would be significant to the objectives of the Birds Directive.

(b) Schedule 1 birds

9.5 Schedule 1 birds are fully protected under the Wildlife and Countryside Act (1981, as amended). As such it is generally an offence to:

- kill, injure or take an individual
- take, damage or destroy the nest of the bird which is in use or is being built
- take or destroy an egg of the bird
- intentionally, or recklessly disturb an individual, which is building a nest, or is in, on or near a nest containing eggs or young.

Effects on golden plover

9.6 Preliminary surveys showed that golden plover occasionally used the site during the winter. The species is known to form an important flock at Newtown Harbour SSSI, a part of the Solent and Southampton Water SPA and Ramsar site, and while not specifically mentioned on the citation for the designated European site as a qualifying feature, the numbers of birds are such that they make a significant contribution to the total population of waterfowl that winter on the site. For this reason, golden plover was considered a 'target species' for the assessment and was specifically examined through the vantage point watches and collision risk analysis.

9.7 The environmental statement and birds technical appendix present the results of collision risk assessments for the key bird species, including golden plover. The assessment is carried out by inputting the results from vantage point surveys at the site into the standard Scottish Natural Heritage (SNH) model developed by Band *et al* (SNH, 2000. *Wind farms and Birds: calculating a theoretical collision risk*). This basic model provides a simple theoretical prediction of collision rates, and is intended to be adapted as appropriate for the specific circumstances.

9.8 Some questions were raised about the validity of the approach used for collision risk assessment for golden plover, as the theoretical collision risks seemed high in comparison to the relatively few flights of golden plover through the wind farm area (especially in comparison to similar studies on other projects elsewhere). The SNH model used is primarily designed for random flights through the wind farm by individual birds such as raptors. The calculations were undertaken in literal accordance with the suggested SNH methodology, and on a worst-case basis to ensure that any risks were not underplayed.

9.9 The analysis has therefore been reviewed by experts associated with the testing and development of the collision risk model (Alan Fielding and Paul Howarth at the Metropolitan University of Manchester). Re-analysis of the original field data suggests that the predictions are significantly pessimistic, largely due to the variation in flock size recorded during the vantage point watches combined with the simplistic data analysis used that simply totalled the numbers of birds and the time spent at rotor height.

9.10 A revised data preparation approach was advised, taking specific account of the number of birds involved for each individual sighting (and the corresponding aggregate time spent in the risk area). The model has therefore been re-run in accordance with this approach, and the results validated by the experts. For clarity and transparency, the detail of the re-modelling is included in full here. Information about the collision risk assessment model is available from the SNH website (www.snh.gov.uk).

Field data

9.11 A total of 40 hours of vantage point observations were made on the site between 27th January and 30th March 2006. The purpose of this work was to map any flights of golden plover and other target species across the site during the period of observation. The site was checked briefly before the commencement of the vantage point work and the presence of any golden plover on site was recorded. The table below shows those dates when golden plover were recorded on site.

Vantage point watch date (only those with golden plover sightings included)	Number of golden plover in flock	Time at rotor height within wind farm area (seconds)	Total time (seconds)
27 Jan 2006	29	30	870
27 Jan 2006	3	30	90
27 Jan 2006	32	15	480
24 Feb 2006	1	15	15
24 Feb 2006	12	60	720
24 Feb 2006	1	45	45
24 Feb 2006	1	345	345
2 March 2006	53	45	2385
		Total time:	4950

Table 9.1: vantage point recordings

a) Data input to model

Number of turbines (N)	6
Area of wind farm (A)	294.55 ha
Rotor radius (R)	41 m
Rotor diameter (d)	82 m
Tower height [2]	59 m
Blades per turbine (b)	3
Chord max (blade width) (c)	3 m
Pitch (γ)	3.5°
Blade rotation(R)	4.17 sec
Golden plover - wingspan	0.76 m
- length	0.29 m
- speed	8 m / sec
Survey period	40 hours (over 2 months)
Total daylight hours	605 (2 months)

[2] [2] It is recognised that two turbine heights exist for the wind farm though only a 59m hub height has been used for the calculations. This is because the model cannot accommodate two hub-heights, and the lower provides a greater blade swept path in the collision zone, and is therefore worst of the two cases.

b) Calculations with all flights included

1 - Flight risk volume = V_W

V_W = Ad
= 2,945,500 x 82
= 241,531,000 m^3

2 - Combined volume swept out by wind farm rotors = V_R

V_R = N π r^2 (c + *l*)
= 6 x π x 41^2 x (3 + 0.29)
= 104,247m^3

3 - Bird occupancy within flight risk volume = n

n = 4950 bird-secs (total time of birds on site at rotor height, from table above)
= 4950 bird-secs per 40 hours
= 4950 / 40 x 605 bird-secs over 2 months
= 74,869 bird-secs over 2 months

4 – Bird occupancy of the volume swept by rotors = O

O = n (V_R / V_W)
= 74,869 x (104,247/ 241,531,000)
= 32.31 bird-secs

5 – Time taken for bird to make transit through rotor = t

t = (c + l) / v
= (3 + 0.29) / 8
= 0.41 sec

6 – Number of transits through rotors
= n (V_R \ V_W) / t
= 32.31/ 0.41
= 78.80 transits

Figures are also fed into a standard SNH spreadsheet to calculate specific risk for this species and this turbine specification: In this case the output is 7.2%.

Collision risk without avoidance
= 7.2% x 78.8
= 5.7

Collision risk without avoidance assuming turbines operating 80% of time
= 80% x 5.7
= 4.6

Collision risk with avoidance (standard 95% avoidance figure from SNH guidance)
= 5% x 4.6
= 0.23

This predicts a collision rate of 0.23 golden plover every 2 months.

Golden plover are present for 6 of the 12 months on this site, so the predicted theoretical annual mortality can be extrapolated:

= 0.23 x 3
= 0.69

The predicted theoretical collision rate is 0.69 golden plover per year.

Over the 25 year life of the wind farm, this equates to a total of:

= 0.69 x 25
= 17.25

The SNH guidance suggests that figures should be quoted +/- 10%. Thus the predicted number of collisions over the 25 years is 16 to 19 golden plover.

c) Calculation with the abnormal flight removed
(i.e. the flight of 345 seconds of a single bird on the 24 Feb 2006)

1 - Flight risk volume = V_W
V_W = Ad
= 2,945,500 x 82
= 241,531,000 m^3

2 - Combined volume swept out by wind farm rotors = V_R
V_R = $N \pi r^2 (c + l)$
= $6 \times \pi \times 41^2 \times (3 + 0.29)$
= 104,247m^3

3 - Bird occupancy within flight risk volume = n
n = 4605 bird-secs (total time of birds on site at rotor height, from table above)
= 4605 bird-secs per 40 hours
= 4605 / 40 x 605 bird-secs over 2 months
= 69,651 bird-secs over 2 months

4 – Bird occupancy of the volume swept by rotors = O
O = $n (V_R / V_W)$
= 69,651 x (104,247/ 241,531,000)
= 30.06 bird-secs

5 – Time taken for bird to make transit through rotor = t
t = (c + l) / v
= (3 + 0.29) / 8
= 0.41 sec

6 – Number of transits through rotors
= $n (V_R \setminus V_W) / t$
= 30.06 / 0.41

= 73.32 transits

Figures are also fed into a standard SNH spreadsheet to calculate specific risk for this species and this turbine specification: In this case the output is 7.2%.

Collision risk without avoidance
= 7.2% x 73.32
= 5.28

Collision risk without avoidance assuming turbines operating 80% of time
= 80% x 5.28
= 4.22

Collision risk with avoidance (standard 95% avoidance figure from SNH guidance)
= 5% x 4.22
= 0.21

This predicts a collision rate of 0.21 golden plover every 2 months.

Golden plover are present for 6 of the 12 months on this site, so the predicted theoretical annual mortality can be extrapolated:
= 0.21 x 3
= 0.63

The predicted theoretical collision rate is 0.63 golden plover per year.

Over the 25-year life of the wind farm, this equates to a total of:
= 0.63 x 25
= 15.8

The SNH guidance suggests that figures should be quoted +/- 10%. Thus the predicted number of collisions over the 25 years is 14 to 17 golden plover.

Summary of collision risk assessment results

9.12 This revised and more appropriate collision risk methodology is believed to give a more reasonable prediction of the collision rate of golden plover, though the output should still be considered very much a worst case scenario given the simplicity of the model and the assumptions made.

9.13 During the survey, erratic (abnormal) flying routes of one golden plover were observed. The predictions in the ES and those shown above are summarised in the following table, one set of results excluding and one set including the erratic flight.

	Original approach		Revised approach	
	With abnormal flight	**Without abnormal flight**	**With abnormal flight**	**Without abnormal flight**
Golden plover per annum	16	7	0.69	0.63
Golden plover over 25 years	368 - 450	150 - 184	16 - 19	14 - 17
% of assumed Island flock/ annum	2.67%	1.17%	0.12%	0.11%
Significance of effect on Island flock	Moderate adverse	Moderate adverse	Slight adverse	Slight adverse
%of total waterfowl flock in SPA/ annum	0.03%	0.01%	<0.001%	<0.001%

Table 9.2: results of collision risk assessment

9.14 The revised results suggest a very slight adverse effect on the Island flock of golden plover (at worst case, less than 1 bird per annum, or 0.12%) and no significant impact on the SPA waterfowl flock (0.00002%).

9.15 Given these revised results, no mitigation is considered necessary. The normal agricultural cropping patterns will be continued in accordance with the farm plan, ensuring that there will be an ongoing availability of open arable land available for the flock.

Migrating passerines and raptors from the New Forest SPA

9.16 English Nature has raised the possibility that migratory birds from the New Forest SPA could pass through the wind farm and be at risk of collision. No field survey for these migratory birds was undertaken on site. It was concluded that the populations of species of concern such as honey buzzard were so small that vantage point observations would be highly unlikely to produce any meaningful records. Diurnal migration of passerines was not considered to be a significant issue as it was concluded that birds would generally fly over the proposed wind farm in good weather conditions and be at little risk. In poor weather conditions migrants would make landfall on the coast and gradually filter across the Island using habitat corridors. This type of behaviour was considered to put birds at minimal risk of collision with turbines. Any nocturnal migration surveys would be unable to distinguish between species involved with certainty.

9.17 A desk-top review has therefore been undertaken to evaluate the risk to birds from the SPA of mortality through collision with turbines, and thus to inform whether appropriate assessment might be required. This is presented below in two sections, with a general review of bird migration followed by a review of the potential impacts on migrants from the New Forest SPA. Specific analysis is included on the potential impacts of the development on migratory passerines and raptors breeding in the New Forest SPA. Of the

interest features included on the SPA citation, honey buzzard, wood warbler and redstart all undertake long-distance migrations between breeding areas in northern Europe and wintering grounds in Africa. These birds could be at risk during migratory movements and any losses could potentially have an adverse impact on the breeding populations in the SPA.

Bird migration – general[3]

9.18 Bird migration covers a variety of movements undertaken by different species in response to a range of factors. In this review the primary concern is the potential for the proposed development to impact on movements of birds between breeding and wintering grounds. For simplicity the terms used by Berthold (2001) are used in this review, hence outward migration refers to movements from breeding grounds to wintering areas and return migration to movements back towards breeding areas.

9.19 Many species are nocturnal migrants, including almost all insect eating passerines and waders. Many of these species only exhibit nocturnal behaviour during migration. Many typically diurnal species move from exhibiting a double peak in diurnal activity to a single peak. Provided migratory birds have sufficient fat reserves, the usual afternoon peak disappears. This activity peak is presumably shifted to the night and transformed into migratory activity. Diurnal migrants include starlings, pipits, larks, buntings, finches and birds of prey.

9.20 Radar studies of migratory birds in northern Germany have found the mean flight height of waders and passerines to be 910m during return migration and 430m during outward migration (mainly waders). The proportion of echoes recorded at a number of different altitudes on outward and return migration are shown table 9.3:

Flight height	Return migration	Inward migration
3000m +	3.5%	1.5%
2000m +	16%	6.5%
1000m+	33%	14%

Table 9.3: flight heights of migratory birds in northern Germany
Source: Information from Jellman (1989) in Berthold (2003)

9.21 A similar study in the Swiss lowlands found a median value of 400m for diurnal migrants and 700m at night for return migrants with 90% of the echoes below 2000m during both periods. Nocturnal migrants generally fly at higher altitudes than diurnal migrants although a range of factors can affect the heights birds fly at. For example, birds tend to fly at higher altitudes when crossing large water bodies than when traversing land and small water bodies. Weather conditions also have an effect with birds tending to reduce altitudes when flying into headwinds. Birds will also alter altitudes depending on the terrain encountered. Lowland areas are generally

[3] Unless otherwise referenced this general overview draws on the work of Peter Berthold (2001).

crossed at relatively high altitudes whereas mountain ranges are crossed at low levels with many birds taking advantage of mountain passes.

9.22 Generally passerines in central Europe have a very long period of outward migration. Studies found that the mean distance travelled on return migration is only 50km a day. It will therefore take a migrating passerine 100 days to cover the 5,000km to wintering areas in Africa. Daily distances calculated for blackcap and garden warbler were 49km and 76km respectively. Short movements tend to be made until large obstacles, such as large water bodies, or deserts are encountered. However, speed of travel generally increases during the later stages of migration and reaches particularly high values when large geographical boundaries are encountered. Nocturnal migrants tend to cover greater distances than diurnal migrants.

9.23 Birds beginning migration may show directional movements by hopping, or even covering short distances by flight during foraging trips. This form of ground migration is thought to be more important at higher latitudes where day length is longer and the intensity of migration in nocturnal migrants develops only slowly, in contrast to central European passerines. Directed ground movements among vegetation may be significant in juvenile dispersal where daily migration covers such small distances that longer flights are hardly likely.

9.24 This behaviour is likely in some passerines where migratory birds will begin a general post-fledging southwards movement. Flight length will increase through the outward migration period. Initial post-fledging movements among passerines are likely to be limited to suitable habitats and birds will be at minimal risk of collision with turbines during this period.

9.25 Passerines moving over more significant geographical barriers such as large water bodies will undertake long periods of sustained flight. A garden warbler with a fat free body mass of 20g and 10g of fat deposits, and an assumed flight speed of 30km/h would potentially be able to cover 900km in favourable conditions. There is evidence that return migrants crossing the Gulf of Mexico will continue to fly between 40-120km inland before stopping if conditions are suitable. The same is likely to apply to European migrants and it is likely that many return migrants would over fly the Isle of Wight and continue onwards towards breeding areas.

9.26 Few satisfactory studies have been conducted into the potential impacts of wind farms on migratory birds. The studies that have been conducted have found that the majority of diurnal migrants fly around turbines and most nocturnal migrants fly over them. The tendency for migrants is to reduce migratory activity or interrupt migration during poor weather conditions, with wind and precipitation considered the main factors influencing migration activity. Birds moving northwards on return migration are likely to be grounded on the south coast of the Isle of Wight during bad weather, well before they encounter the proposed development. Conversely birds moving from the Hampshire coast are unlikely to begin migrating flights over water

until weather conditions are favourable. Therefore the risk to migratory birds from the proposed development is considered minimal.

Potential impacts on interest features of the New Forest SPA

9.27 The New Forest qualifies for Special Protection Area status under a number of criteria listed in the Birds Directive. The New Forest qualifies under Article 4.1 of the Directive by supporting populations of European importance of the following species listed on Annex I of the Directive:

Breeding season

- Dartford warbler (*Sylvia undata*) 538 pairs (33.6% of the GB breeding population)
- Honey buzzard (*Pernis apivorus*) 2 pairs (10% of the GB breeding population)
- Nightjar (*Caprimulgus europaeus*) 300 pairs (8.8% of the GB breeding population)
- Woodlark (*Lullula arborea*) 184 pairs (12.3% of the GB breeding population).

Wintering

9.28 Hen harrier (Circus cyaneus) 15 individuals (2% of the GB wintering population).

9.29 The breeding populations of hobby (*Falco subbuteo*), wood warbler (*Phylloscopus sibilatrix*), lapwing (*Vanellus vanellus*), redshank (*Tringa totanus*), curlew (*Numenius arquata*), snipe (*Gallinago gallinago*), stonechat (*Saxicola torquata*) and redstart (*Phoenicurus phoenicurus*) also mean the site qualifies as an SPA under Article 4.2 of the Birds Directive.

Wood warbler

9.30 Survey work undertaken in 1980-83 concluded that there were around 450 territorial wood warblers in the New Forest (Clarke and Eyre, 1993). To date this remains the best estimate of numbers within the New Forest, although this figure is likely to over-represent the actual number of breeding birds. The breeding Atlas estimates a total of 17,200 singing males in Britain (based on a single species survey undertaken in 1984-85). The distribution of wood warbler in the UK shows a distinct westerly bias with strongholds in the upland oak woodlands of Devon, Wales and the Marches as well as central western Scotland (Gibbons et al, 1993). Although only representing 2-3% of the UK population, the wood warbler population of the New Forest is a significant concentration of breeding birds away from its western strongholds.

9.31 Birds typically arrive back in Hampshire in the second half of April and are frequently noted on breeding grounds rather than at coastal locations. The peak arrival period is generally around the first week of May (Clarke and

Eyre, 1993). This pattern of few records from coastal localities during migration fits into the national pattern. Records of migrating wood warbler generally average less than two birds per season (spring and autumn) observed at most observatories in the UK (Wernham et al, 2002). The table below shows records of migratory wood warblers recorded from south coast observatories in recent years.

Year	Dungeness	Portland
2006	Four - 30/4/06 One - 1/5/06	One – 21/4/06 One – 3/5/06
2005	One - 30/4/05	One - 30/4/05 One - 1/5//05
2004	One – 1/5/04 One – 12/5/04	One - 30/4/04 One – 9/5/04 One – 9/5/04 One – 11/5/04 Three – 13/5/04
2003	No records	Two – 21/4/03 One – 2/5/03
2002	One – 22/4/02 One – 25/4/02 One – 12/5/02	Two – 3/5/02 Two – 4/5/02 Three – 5/5/02
2001	One – 2/5/01	One – 28/4/01 One – 15/5/01

Table 9.4: records of wood warbler in April and May from Dungeness and Portland Bill

Information obtained from websites (see website references).

9.32 Records of birds trapped and ringed at Portland cover the period 1951-2001. During this period a total of 60 wood warblers have been caught and ringed, an average of just over one bird a year. In reality the records of wood warbler are patchy with many blank years and up to 10 birds trapped in other years. The numbers of wood warbler trapped at Portland would suggest that this species is likely to over fly the coast and continue on to breeding areas during migration if conditions are favourable.

9.33 Between 1951 and 200, more melodious warblers (100) and wrynecks (64) have been trapped at Portland than wood warblers. Both wryneck and melodious warbler are considered scarce, but regular migrants to the UK Given the average numbers of wryneck and melodious warblers occurring annually in the UK were 254 and 30 respectively between 1990-99 (Fraser and Rogers, 2001), the data from ringing at Portland would suggest that wood warblers are a genuinely scarce bird at coastal watch points on migration.

9.34 Even birds with smaller breeding populations in the UK than wood warbler (17,200 singing males) are trapped on a more regular basis. For example an estimated 5,000 pairs of nightingale occur on the UK (Gibbons et al, 1993), 109 have been trapped at Portland. The differences in numbers trapped at Portland cannot be readily explained by differences in migratory patterns as

species such as grasshopper warbler which have a bias to the west coast in terms of migration routes (Wernham et al, 2002) (and a similar sized breeding population) are trapped with much greater frequency than wood warbler (339 ringed birds 1951-2001) at Portland.

9.35 During outward migration most wood warblers move in a south easterly direction and enter eastern Africa through the central and eastern Mediterranean (Wernham et al, 2002). The scarcity of records from well-watched coastal points and the few recoveries of ringed birds between England and Italy could indicate that this initial flight is undertaken in one go (Wernham et al, 2002). Most of the movement of birds from breeding areas is undertaken in August. Birds returning in spring take a westerly route through Africa though there are few records from migration points. In favourable conditions birds will over fly the coast and continue onto breeding areas. For example, a bird ringed on the 8th May on the Calf of Man was recorded 205km to the north in Scotland on breeding territory less than 24 hours later (Wernham et al, 2002).

9.36 Ringing recoveries from wood warblers trapped in Hampshire have confirmed the general dispersal of birds of outward migration. A bird ringed at Eyeworth on 13th June 1981 was trapped at Horsham, West Sussex on 27th July 1981. A bird ringed at Aldershot on 17th June 1989 was caught at Cuckfield, West Sussex on 30th July 1989. Finally, a bird ringed at Lyndhurst on 15th June 1956 was recovered at Padova, Italy on 15th August 1956, a distance of 1160km ESE of Lyndhurst (Clarke and Eyre, 1993).

9.37 The pattern of dispersal of wood warblers on autumn migration would suggest that autumn passage through the Isle of Wight is likely to be insignificant, with most birds moving south east from breeding grounds. The general scarcity of records of wood warbler during migration on the Isle of Wight, and at other coastal watch points on the south coast such as Portland supports the conclusion that there is little significant migration through Hampshire, Dorset and the Isle of Wight in autumn.

9.38 The pattern for spring migration would indicate that migration occurs on a broad front and birds are not regularly grounded on the coast during this period. The rapidity with which return migrants move would suggest that unless birds encounter poor weather they are unlikely to stop on the coast and will continue to fly on to breeding areas. Birds heading for the New Forest are likely to over fly the Isle of Wight and therefore be at little risk from the proposed development.

9.39 No wood warbler breed on the Isle of Wight and records of migratory birds are scarce. This paucity of records of birds on migration is very similar to most coastal sites along the south coast. General evidence on passerine flight heights would indicate that migratory birds will be flying at heights well above the turbines and collision risk would be minimal (Berthold, 2003). Wood warblers do not appear to be particularly prone to grounding during periods of poor weather during migration periods and there is some evidence to suggest the birds are capable of sustained flights of considerable distances

during migration (Wernham, 2002). Therefore, it is not considered that the proposed development would pose a threat to the breeding population of wood warbler in the New Forest SPA.

Redstart

9.40 The population of redstart in the New Forest was estimated to be in the region of 1,000 – 1,100 singing males in the late 1980s and early 1990s. The mean arrival date for the first spring migrants in Hampshire between 1971-1992 was the 7th April (Clarke and Eyre, 1993). The main passage period in spring runs between late April and the end of May. The peak autumn passage is between late August and the middle of September. The following table shows numbers recorded in Hampshire during the autumn migration period.

	Aug 1-15	Aug 15-31	Sept 1-15	Sept 15-30
1997		53	50	59
1998	4	30	45	16
2000	10	75	29	3

Table 9.5: Redstart numbers recorded during autumn migration in Hampshire
Source: Hampshire Bird reports 1997, 1998 and 2000.

9.41 The maximum count of redstart in autumn 2000 in Hampshire was 14 birds on Old Winchester Hill on the 29th August (Eyre and Wynn, 2002). This peak count also corresponded with peak autumn counts on the Isle of Wight and at Hengistbury Head. It is considered reasonable to assume that the pattern of autumn dispersal in the Isle of Wight is similar to that recorded in Hampshire.

9.42 Redstarts tend to move south west from breeding grounds, with British breeders moving towards Iberia. Post-breeding dispersal tends to be in southerly direction, with the main migration period occurring in September (Wernham, 2002). This species is a regular feature of autumn coastal watch points and large numbers are a feature of classic east coast falls in late August and September. This movement also includes Scandinavian breeders. Birds from the continent are likely to occur along the south coast during autumn migration, making it difficult to separate birds breeding in the New Forest SPA from those breeding in Continental Europe.

9.43 Records of ringed redstarts confirm that there is a general movement of birds south west in autumn. A bird ringed in Fordingbridge on 4th June 1968 was shot in Algeria on 7th April 1969. Similarly, a bird ringed at Hamble on 12th September 1986 was recorded in Morocco on the 24th April 1987. The assumption that continental birds also pass along the south coast of England is supported by a record of a bird ringed in Germany on 25th August 1973 that as caught at Farlington Marsh on 9th September 1973 (Clarke and Eyre, 1993).

9.44 The breeding distribution of redstart is similar to wood warbler but the differing migration strategies mean that birds moving from west coast

breeding areas such as Devon and Wales will be moving away from the Isle of Wight. A south westerly dispersal route would mean most breeding birds from the New Forest SPA are unlikely to cross the Isle of Wight. There is some evidence of a generally southerly dispersal post-breeding before the main migration movement and this would mean it is likely that birds from the SPA will occur on the Isle of Wight. However, it would be difficult to distinguish birds from the New Forest SPA from birds arriving from Europe and passing through the UK en-route to Iberia.

9.45 The regular occurrence of redstart along the east coast of England in autumn is largely due to continental birds crossing the North Sea. Large numbers can be temporarily grounded in conditions of south or easterly winds and weather fronts along the UK coast. Birds leaving the New Forest would not get caught in these conditions and regular large-scale falls of redstarts are not a feature of the Hampshire coast. A large proportion of birds recorded along the south coast of England during autumn are likely to be continental breeders. Given that there is general evidence of passerines on migration flying at heights well above the turbines, the collision risk would be minimal (Berthold, 2003). Therefore, it is not considered that the proposed development would pose a threat to the breeding population of redstart from the New Forest SPA.

Honey buzzard

9.46 Honey buzzards are a very scarce, but regular breeder in the UK. The status of some breeding populations is kept secret, making it difficult to establish a picture of its true status in Britain. The minimum and maximum number of pairs estimated to be breeding in Britain by the Rare Birds Breeding Panel in sample years between 1986 and 1996 are shown below (Ogilvie *et al.*).

1986	1990	1994	1996
1-6	3-19	9-28	14-34

Table 9.6: numbers of breeding honey buzzards in the UK 1986 - 1996

9.47 To some extent the increase in numbers is real, although it also reflects a reduction in the secrecy surrounding some of the breeding populations. In the last ten years honey buzzards have been recorded in a number of upland areas of Wales and Scotland where breeding was not previously suspected. Provisional data from a survey in 2000 suggested that there were 29 confirmed breeding pairs, with 61 possible breeding pairs. A breeding population of 50-60 pairs in a typical year is generally accepted as a reasonable estimation of the current population (Roberts *et al*., 1999).

9.48 The New Forest has long been recognised as a stronghold for honey buzzard in England. Between 1954 and 1960 up to four pairs were present, with six - nine pairs present between 1961 and 1980. Numbers of breeding pairs then dropped to two pairs (three pairs in two years) between 1981 and 1992. There have been a total of 93 breeding attempts between 1954 and 1992 with a minimum of 133 young fledged during this period (Clarke and Eyre, 1993).

9.49 Breeding success of the New Forest birds is 1.43 birds per nest (based on figures in Clarke and Eyre, 1993), which is slightly below the figure of 1.66 young per breeding attempt found in a survey of 15 UK nests (Roberts et al, 1999). The figure of 1.66 young per nest compares well with studies of nesting success in Germany where studies of honey buzzard nests recorded fledging rates of 1.6 birds per successful breeding attempt (in Roberts et al, 1999).

9.50 Non-breeding birds are also a feature of the New Forest during the summer, with birds recorded from seven areas in 1998, with 13 individuals recorded although only one successful breeding attempt was recorded (Casalis, 1999). Using the figures available in published literature, the New Forest population each year is likely to be in the range of four – 3 adult birds with three - four juveniles present from August onwards once fledged. Using the figures from the 2000 census the numbers of honey buzzards in the UK in a typical summer (not including non-breeding individuals) would be 58-122 individuals rising to between 106 and 203 birds once juveniles have fledged (assuming all birds raise chicks to fledging at 1.66 birds per breeding attempt).

9.51 Honey buzzard does not breed on the Isle of Wight and are therefore only likely to be at risk during migration periods. Records of honey buzzard from the Isle of Wight, (collated from bird reports by Dr Colin Pope) and records of birds from Hampshire (Clarke and Eyre, 1993) are set out below for comparison purposes.

Year	Isle of Wight	Hampshire
1990	3	1
1991	3	3
1992	2	3
1993	5	6
1994	5	2
1995	7	7
1996	8	6
1997	4	3
1998	6	14
1999	6	8
2000	24*	124*
2001	7	-
2002	6	-
2003	3	-
2004	9	-

Table 9.7: numbers of honey buzzards recorded in Hampshire and the Isle of Wight 1990 – 2004

*In common with the rest of the British Isles, Hampshire and the Isle of Wight experienced the unprecedented autumn passage of this species in 2000. The increase in numbers reflected the southerly movement of birds from the north east coast of England at the end of September, with other south coast sites recording the largest counts at this time. For example, 63 birds were recorded at Beachy Head on the 30th September and at least 35 recorded at Portland on the same day (Eyre and Wynn, 2002).

9.52 There is a general trend across the UK for increasing numbers of honey buzzard to be recorded on migration. The increases in records may be due in part to increases in the numbers of honey buzzard breeding in the UK and partly due to increased observer coverage. The mean number of migratory honey buzzards recorded between 1986-1989 was 60 a year, rising to 109 a year between 1990 and 1995 (Fraser *et al*, 1999). The mean number of sightings between 1990 and 1999 was 124 birds per year. (Fraser and Rogers, 2006)

9.53 In 1992 a total of 107 passage honey buzzard were recorded in the UK, with 63 records between April and 20th July and 44 recorded in autumn between 21st July and 11th October (Evans, 1992). In 1999, 116 migrants were recorded, with 50 in spring and 56 in autumn (Fraser *et al*, 1999). These records show most birds are recorded in southern and eastern counties of England with a bias to the east coast during spring migration and more records from southern coastal counties during the autumn. The wide scatter of records of birds during both spring and autumn would indicate birds migrate on a broad front and the English Channel does not represent a significant obstacle to these raptors.

9.54 Migratory movements of honey buzzard tend to be concentrated in May during spring and August and September during a more protracted autumn migration. The earliest record of honey buzzard in the New Forest is the 23rd April 1960 with the latest record the 18th September (Clarke and Eyre, 1993). The following tables (9.8 and 9.9) show records of honey buzzard by week from the Isle of Wight and cumulative monthly totals from Hampshire respectively for comparison.

Wk	*Tot Recs	**Tot inds	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
17	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
18	2	2	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
19	3	3	-	-	-	1	-	-	-	-	-	-	-	1	-	-	1
20	2	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
21	3	3	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1
22	1	1	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-
23	3	3	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-
24	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
25	2	2	-	-	-	-	1	-	1	1	-	-	-	-	-	-	-
33	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
34	1	1	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-
35	13	16	-	-	-	-	-	6	-	-	1	1	2	1	-	2	3
36	11	13	2	-	-	-	-	-	2	1	1	5	-	-	1	-	2
37	8	8	1	-	-	-	1	-	3	-	1	-	-	-	1	-	1
38	15	19	-	1	2	1	2	6	-	-	2	-	4	-	1	-	-
39	8	8	-	-	-	2	-	-	-	-	-	-	3	2	-	1	-
40	15	25	-	-	1	-	-	-	-	-	-	-	24	-	-	-	-
41	2	2	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-
42	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
44	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-

Table 9.8: Honey buzzard records from the Isle of Wight by week 1990 – 2004
*total records
**total individuals

	May	June	July	Aug	Sept	Oct
Inland	6	4	4	6	11	2
Coastal	2	1	0	0	8	4

Table 9.9: cumulative monthly total of honey buzzard in Hampshire 1973-92

9.55 There have only been three records of honey buzzard in Hampshire in April (Eyre and Wynn, 2002) and birds are not generally back on breeding areas in the SPA until May. It is possible that birds in April continue to move further north to breed and are not part of the SPA breeding population.

9.56 The main peak of records in spring on the Isle of Wight are between weeks 17 to 25 (21 April to 15 June), with fewer birds recorded in spring than autumn. The concentration of records of return migrants in May strongly correlate with peak return passage in Israel. Studies found that relatively few honey buzzards move through the Arava Valley in April, numbers rapidly increase in early May with 300-500 birds passing each day (with an exceptional count of 6,000 birds on 7th May). Numbers begin to fall after the 10th May, with only the occasional large count made after this date (Bruderer *et al*, 1994). These numbers are relatively insignificant compared to the 200,000-850,000 birds estimated to pass through Eilat each spring.

9.57 Birds passing through Israel in early May could rapidly reach the UK. Radio tracking of adult birds on autumn migration in the UK has shown birds are

capable of covering between 115km and 210km a day (www.roydennis.org/honeybuzzard). Studies in Israel and Switzerland have estimated gliding speeds of between 43-52km/h for honey buzzards on migration (Bruderer et al, 1994). The differences in gliding speed is believed to be related to thermal strength, with birds in Israel using steeper gliding angles when leaving thermals, thus achieving a faster descent and higher gliding speed. The distance travelled between thermals was shorter in Israel than Switzerland, and gliding flights between thermals in Switzerland seem to be supported by wing-flapping.

9.58 Using the figures given above during an 8-hour day, honey buzzards could cover 344-416km in optimal conditions. There is evidence from Israel that honey buzzards will make use of flapping flight in the early morning and towards the evening as thermals reduce (Bruderer, 1994). This strategy allows birds to make full use of the daylight hours and could mean that the range estimates given above for flight under optimal conditions are conservative.

9.59 The peak for autumn records on the Isle of Wight is the first three weeks of September, with the autumn migration period spanning weeks 33 to 44 (12 August to 26 October). This peak in early September fits well with national trends, for example during autumn 2003 there was an upsurge of records during August with numbers peaking in the first 10 days of September (Fraser and Rogers, 2006). The trend of more records during autumn is reflected in Hampshire and also nationally. In the 1990s the mean average for honey buzzard records in spring was 45, with a mean of 59 records during autumn (Fraser and Rogers, 2006). The higher numbers recorded in autumn are likely to be a reflection of the greater numbers of birds present in the UK once juveniles have fledged. Adult birds tend to begin outward migration several weeks before juveniles, which adds to the lengthy outward migration period (Wernham, 2002).

9.60 The peak period for outward migration in studies in Israel was found to be between 5th and 20th September (Bruderer, 1994). Between 100-300 birds per day passed through the Arava Valley during this period, with numbers falling throughout the rest of September and the final records in early October. Outward migration through the Arava Valley is less pronounced than return migration with most birds moving through the Negev Highlands in autumn (Bruderer, 1994).

9.61 Radio-tracking of juvenile honey buzzard in the UK has shown that once fledged juveniles spend a number of weeks in the general vicinity of the breeding area before beginning outward migration (www.roydennis.org/honeybuzzard). Juveniles then start a rather protracted southerly movement, with birds frequently lingering in certain areas for a number of days. A juvenile bird from Scotland left its natal area on the 7/9/01, but had only reached Lancashire by 17/9/01 where it remained until 24/9/01. This bird spent two days in Herefordshire in October. Another juvenile from the same nest took nearly a month (29/9/01 – 21/10/01 at least) to move from the north to south coast of Ireland.

9.62 The slow movement of juveniles through the country is in direct contrast to the rapid departure of adult birds. An adult bird tagged in Scotland in 2002, left Inverness on 5/9/02 and was recorded near Oxford on the 10/9/02. Two days later the bird was recorded in northern France and had reached North Africa by the 20/9/02 (www.roydennis.org/honeybuzzard).

9.63 The distribution of migratory honey buzzards at regional and local levels does not show any strong trends towards favoured migration routes. Records tend to be widely scattered and occur at both inland and coastal locations. The radio-tracking of birds in Scotland supports the assumption that birds are not tied to particular routes and juveniles in particular tend to move in an undetermined way through the country. These dispersal patterns over a broad front make it difficult to establish if birds recorded from the Isle of Wight are from the New Forest SPA or other breeding populations. Certainly records of juveniles in September could originate from any breeding population.

9.64 There are more frequent records of honey buzzard from the eastern side of the Isle of Wight (see below), although it is not clear whether this is a reflection of observer bias or a definite trend in the behaviour of honey buzzards. The wide scatter of records would indicate that birds migrate on a broad front through the UK and are not using specific points to cross the English Channel. Concentrations of raptors at narrow crossing points are a feature of several places around the Mediterranean coast such as the Straits of Messina and the Straits of Gibraltar.

Area of records	No of records	No of birds	Migration
Ventnor Downs	38	48	Autumn (Aug/Sept)
East Wight excl. Ventnor area	19	21	6 in spring 13 in autumn
St Catherine's/ Brighstone	14	20	3 in spring 11 in autumn
Downs around Freshwater	10	12	Autumn (Aug/Sept)
Newtown/Newbridge	7	7	Autumn (Aug/Sept)
Fort Victoria	3	3	2 in spring 1 in autumn
Thorley	1	1	Spring (May)

Table 9.10: distribution of honey buzzard records on the Isle of Wight

9.65 Birds of prey, although capable of migrating at night, are primarily diurnal migrants. As soaring flight uses 15-30% of the energy required for flapping flight (Berthold, 2003), most migrating birds of prey gain height by using thermals and then glide, losing height steadily, until another suitable thermal is found. The records of honey buzzard from the south coast of the Isle of Wight are likely to relate to birds attempting to gain height before leaving the island.

9.66 Honey buzzards are intermediate between birds that use flapping flight on migration such as falcons and specialized soaring species such as kites and 'true' buzzards. The ability of honey buzzards to alternate between flapping and soaring flight, and combine gliding and flapping in straight flights (including flapping flight for long distances) mean this species is more flexible in its migration behaviour than pure soaring species (Bruderer, 1994).

9.67 In the Arava Valley, Israel most migrating honey buzzards were recorded between 200 and 700m above ground level (AGL), lower numbers between 1000 – 2000m AGL and very few above 2000m. Under optimal light conditions 85% of birds flew below 1000m, the average height being 600m AGL. Although the trade winds oppose the migratory direction during return migration, no difference in altitudinal distribution was recorded between outward and return migration (Bruderer, 1994).

9.68 The study found that birds would only begin to cross the Arava Valley about two hours after sunrise, when thermals began to develop. During the first three hours after sunrise virtually all activity was below 400m, with an increase in the lower limit of migration activity around seven hours after sunrise to 400m AGL, which reduced back to 200m AGL about 10 hours after sunrise.

9.69 Studies in Switzerland found similar flight heights for migratory honey buzzards, with preferred flight heights of around 500m and similar heights of climbs in thermals recorded (Bruderer, 1994). However, there is a danger in using flight height data from specific studies and applying these finding as universal rules. For example, there is a suggestion that honey buzzards crossing the Negev Highlands (450m above sea level) may fly lower to the ground than those crossing the Arava Valley (150m below sea level). This is particularly relevant when comparing findings from the Middle East, where there is intense thermal activity to the much cooler, temperate conditions of the UK.

9.70 The evidence available from radar tracking honey buzzards on migration both in Europe and the Middle East would indicate birds move at heights between 500-600m AGL. This would put the birds well above the top height of the turbines. Honey buzzards may use the Isle of Wight as a crossing point and use the Downs to gain height before crossing the Channel, which could explain the number of records from along the south coast of the Island in autumn.

9.71 Studies have shown that soaring birds, such as honey buzzard, will gain height rapidly in suitable conditions (Bruderer, 1994). It is not considered that the birds will be at any significant risk from the proposed development whilst attempting to gain height before crossing the Channel. The wide scatter of records of honey buzzard across the Isle of Wight and Hampshire during migration periods would suggest that migration takes place over a broad front and the Island is not a focus for migratory activity.

9.72 The distances covered by honey buzzards in a single day and the typical heights recorded of migratory birds would indicate the birds are unlikely to be exposed to any significant risk from the proposed development. Birds would rapidly over fly the site and are likely to be moving at a height well above the area swept by the turbine blades. Honey buzzards are likely to be most at risk during periods of poor weather, when heavy precipitation or strong headwinds could reduce the optimal flight height of migrating birds and bring them down to a height where collision with turbines is possible. Honey buzzards are most likely to be moving in good weather conditions to take advantage of any thermal activity. Birds are unlikely to attempt potentially risky sea crossing in periods of poor weather. The combination of factors described, i.e. poor weather coinciding with the exact time a honey buzzard is crossing the western side of the Island, would be an extremely rare event. A theoretical risk exists, but this is considered so small to be negligible.

9.73 The risk to migratory honey buzzard is considered to be extremely low as only a handful of honey buzzards are recorded on the Isle of Wight each year and there is no evidence of significant migration across the Island. It is therefore considered that this development does not pose a significant risk to the breeding honey buzzard population of the New Forest SPA.

Hobby

9.74 Hobbies are a regular but rare breeder in Britain. It is the only migratory falcon breeding in the UK and is normally present between late April and late September. The most recent population estimate has shown an increase in numbers with 2,200 breeding pairs in the UK. In 2000 and 2001 the breeding population in Hampshire was between 8 and 70 pairs. The Isle of Wight supports less than 2 breeding pairs during this period (Ogilvie *et al*, 2002 and 2003).

9.75 Hobbies are known to migrate on a broad front. Surveys during the migration season recorded counts of 250 or more birds at only two known raptor migration bottlenecks (Malta and Cap Bon in Tunisia). The European population of hobby is estimated to be in the region of 20,000-27,000 pairs. There is evidence of hobbies in particular flying at considerable heights with birds recorded reaching heights of 600m plus in a thunder cloud in Africa and hunting birds ascending over mountain passes at heights 1,000-2,000m above ground level (Wernham *et al*, 2002).

9.76 It is considered that with birds migrating from the New Forest on a broad front and likely to be moving at heights well above rotor height the risk of collision with turbines will be minimal. Hobbies are very agile birds capable of capturing aerial prey such as swallows and swifts. It is likely that birds would be capable of easily avoiding turbines should they be crossing the wind farm area at lower altitudes. It is considered that the proposed development poses little risk to the breeding population of hobbies within the New Forest SPA.

Nightjar

9.77 Nightjar is a summer migrant to the UK and breeds primarily on lowland heath or forestry plantations. A 2004 survey found 54% of male nightjars holding territory in forestry plantations and 38% on lowland heath. The British population in 2004 was 4,500 'churring' males (www.bto.org). Hampshire supported a population of 781 males in 2004, an increase over the 514 birds recorded in the county in 1992. In contrast to the increases in birds in Hampshire the Isle of Wight population fell from 59 males in 1992 to only 19 in 2004.

9.78 Little is known about nightjar migration except that it occurs at night, singly or in small groups (BWP, 1998). It is known however, that there is a high level of fidelity to breeding sites. Of 15 breeding males trapped in the New Forest, none were identified as moving from the sites where they were originally trapped (Wernham et al, 2002). Records of nightjar from coastal locations are relatively scarce suggesting that birds move on a broad front.

9.79 It is assumed that the general findings relating to migrating passerines are applicable to nightjar. Given that birds are likely to move singly and across a broad front it is considered that the risk of collision with turbines will be minimal. It is not considered that the breeding population of nightjar in the New Forest SPA will be adversely affected by the proposed development.

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10. Cultural heritage

10.1 No clarifying information requested.

11. Landscape and visual effects

11.1 Landscape and visual effects is always a sensitive issue for wind farm proposals. The IoWC requested clarifying information on a number of matters in the assessment, which are addressed in the text below. The requests included, amongst other things, illustrations for four viewpoints and subsequent photomontages to bring the total to 22. In addition, all photomontages and wire frames have been developed to illustrate the position of the switching station and meteorological mast that were not included in the originals. All amended figures appear at the end of this chapter.

11.2 The additional viewpoints were discussed and agreed with the IoWC, and have been included specifically to address concerns raise by the council, public and statutory consultees as part of consultation responses on the landscape and visual assessment.

11.3 A full set of revised photomontages and wire frame images for viewpoints 1-22 (figure 11.1 viewpoints 1-22 photomontages), together with the corresponding winter/spring photographs (figure 11.2 viewpoints 1-18 photographs), are provided at the end of this chapter. These replace figures 8.8 and 8.9 respectively from the ES. In order to provide a complete set in the Addendum, the seascape baseline winter / spring photographs have also been included as figure 11.2a viewpoints 1-5.

11.4 As noted in chapter 8, paragraph 8.12 of the environmental statement, the landscape and visual assessment was based on current published guidelines. This included the Countryside Agency's *Landscape Character Assessment for England and Scotland (2002)* and the *Guidelines for Landscape and Visual Impact Assessment* by the Landscape Institute and the Institute of Environmental Management and Assessment (2002). Current guidance on the assessment of wind farms produced by the Scottish Natural Heritage also informed the scheme design and assessment of landscape and visual effects.

11.5 The following two paragraphs are direct replacements of the original text.

Paragraph 8.1 of the ES should read as shown in box 2.

8.1 The landscape and visual assessment for the proposed West Wight wind farm was undertaken during 2004/early 2005 by E4environment (supported by Dr Phil Marsh) and, more recently, by Terence O'Rourke. The original landscape character assessment was undertaken by E4environment, and Terence O'Rourke used this as a basis for updating the work in 2006 to reflect newly published landscape character assessments. The original viewpoint analysis and visual assessment were undertaken by E4environment and illustrated by zones of visual influence and viewpoint figures produced by Dr Phil Marsh. These figures have been reproduced in the ES by Terence O'Rourke and supplemented with second season (early spring) photographs from the original 18 viewpoints and from the ferry routes.

Similarly paragraph 1.1 of the landscape technical appendix should read as follows.

1.1 The landscape and visual assessment for the proposed West Wight wind farm was undertaken during 2004/early 2005 by E4environment (supported by Dr Phil Marsh) and, more recently, by Terence O'Rourke. The original landscape character assessment was undertaken by E4environment, and Terence O'Rourke used this as a basis for updating the work in 2006 to reflect newly published landscape character assessments. The original viewpoint analysis and visual assessment were undertaken by E4environment and illustrated by zones of visual influence and viewpoint figures produced by Dr Phil Marsh. These figures have been reproduced in the ES by Terence O'Rourke and supplemented with second season (early spring) photographs from the original 18 viewpoints and from the ferry routes.

Box 2.

Ancillary structures

11.6 The meteorological mast and switching station have been included on the photomontages and wire frames. Although the mast was not illustrated on the photomontages in the original ES, its potential impact in combination with the turbines was assessed as part of landscape and visual effects and therefore the assessment of impacts remains unaltered. The landscape and visual assessment also took account of all ancillary structures including the crane pads, switching station and permanent tracks. However, having updated the photomontages and wire frames, the assessment of effect was revisited, and, for completeness, the following text on ancillary structures has been provided to support the original assessment.

11.7 Beyond an approximate radius of 3-4km it is considered that all ancillary structures, including the meteorological mast, will be barely perceptible, especially when viewed in the context of the wind turbines. It can be seen in viewpoint 6 (3.5 km from the nearest turbine) and viewpoint 7 (4.6km from the nearest turbine) that the thin lattice structure of the meteorological mast is effectively lost in the view. For viewpoint 21 (3.1km from the nearest turbine) and viewpoint 5 (3.3km from the nearest turbine), the mast is just

visible to the left and right of the cluster of turbines, respectively. However, when seen in the context of the panoramic view and adjacent turbines, the structure is barely discernable, and the overall effect and level of significance assessed for these viewpoints remains unaltered.

11.8 From viewpoints closer to the turbines, the switching station will either be hidden by a combination of landform and vegetation, or, where visible, will be indistinguishable in the overall view (refer to viewpoints 1, 2, 3 and 4). The meteorological mast will be a visible structure from local viewpoints. However, it can be seen that in viewpoints 3 from Thorley Church gate (1.4km from the nearest turbine), viewpoint 4 from Crompton Down (1.9km from the nearest turbine) and viewpoint 20 from the Hamstead Trail (1.4km from the nearest turbine), the mast, although visible, will not become a prominent additional feature in the line of turbines.

11.9 At approximately 1 km or closer, although still remaining a transparent structure in the view, the mast will become a more prominent element of the proposals, principally when viewed from adjacent public rights of way within the site or from vantage points to the south of the site. In viewpoint 2 from the B3399 (to the south of the site), the mast is clearly visible to the left of turbine 2, and has mostly sky as a background. In the context of the turbines the structure is not considered significant, and the assessment for this viewpoint remains unchanged. In views from north of the site, including those from the settlements of Wellow and Thorley, a combination of intervening landform, buildings and vegetation will tend to limit or completely screen views of all ancillary structures, including the meteorological mast (refer to viewpoints 1 and 3).

11.10 Although the meteorological mast will be visible in the Open Farmland landscape type, it is not assessed as becoming a defining feature or significantly altering the intrinsic characteristics of the landscape.

Representative viewpoints

11.11 The IoWC requested supplementary representative viewpoints as part of the landscape and visual assessment. Following a site visit and subsequent consultation, it was agreed that three additional viewpoints would be provided on the Isle of Wight. At the same time, it was proposed to provide a fourth viewpoint from mid-Solent to clarify queries received from consultees, including the Countryside Agency.

11.12 For each of the four representative viewpoints, summer baseline photographs and photomontages of the proposals have been provided at the end of this chapter. A visual assessment for each of the viewpoints is provided below, in accordance with the methodology set out in the landscape and visual effects technical appendix. Viewpoint locations are shown on figures 11.3 and 11.4.

Viewpoint 19: Fenced tumuli next to Tennyson Trail, Harboro / Mottistone Down

11.13 *Location:* viewpoint 19 is located on the top of the fenced tumuli at Harboro / Mottistone Down, adjacent to the Tennyson Trail. It is located within the Chalk Downs landscape type and is inside the AONB designation.

11.14 *Existing view:* the immediate foreground is occupied by the group of tumuli within the fenced off area. This area is mostly covered by long grass, although gorse is also present. To the left of the view is the Tennyson Trail and to the right is the plantation on Chessell Down. In the gap between Brook Down and Chessell Down the site is clearly visible, although its eastern edge is partially screened by the plantation on Chessell Down. The Solent is visible beyond the site; the eye is drawn to the white cliffs at Highdown in the distance and to the sea, especially on a sunny day when the cliffs are sunlit. The white chalk path of the Tennyson Trail climbing Brook Down also draws the eye.

11.15 *Predicted view:* the predicted view is illustrated by the photomontage in figure 11.1 (19 of 22). This shows that turbines 1, 2, 3 and 4 will be visible as a line across the site in the middle distance. Turbine 5 will be viewed as a hub and rotor sweeps, with the lower half of the tower partially screened by the plantation on Chessell Down. Turbine 6 is not visible and the meteorological mast is not discernible in the view.

11.16 *Magnitude of change*: the nearest turbine will be approximately 2.6km away and the furthest turbine will be 3.9km away. The turbines will occupy approximately 18^{o} of the overall view, although turbines 5 and 6 will be screened to varying degrees by landform/vegetation. The towers, hubs and tops of the rotors will have land and sea as a background. The turbines will be visible in moderate (at least 4km) or better visibility, which occurs > 95% of the time. Assuming excellent visibility and that the observer is being exposed to the view for the first time, the distance to and width of the array is such that the turbines will be visible elements in the view and the magnitude of change is assessed as *moderate*.

11.17 *Visual receptors:* this is a location where people tend to stop and 'take in' the view. So, although the main receptor will be walkers, cyclists and horse riders, the view is likely to be perceived whilst stationary. The view is from a nationally designated landscape of high importance and people are likely to be in this location to enjoy the view. On this basis, this location is likely to have a high sensitivity to change for these receptors.

11.18 *Overall effect and significance:* the high sensitivity combined with the moderate magnitude of change gives an overall effect of major/moderate, which suggests that the proposed development will result in a significant change in the view from these types of receptors at this location. The impact is assessed as adverse. However, the views generally from this location, including the Tennyson Trail, will tend to be less significantly affected, with

more of the site and the turbines hidden by the landform and nearby plantation.

Viewpoint 20: Hamstead Trail by metal gate, south of B3399

11.19 *Location:* viewpoint 20 is from the Hamstead Trail standing next to a metal gate at the base of Wellow Down, and just above the point at which a bridleway crosses the path from east to west. It is just within the northern edge of the Chalk Downs character type and is inside the AONB and Heritage Coast designations.

11.20 *Existing view:* the agricultural fields of the Open Farmland character type dominate the foreground view, contrasting with the wooded landscape of the Rolling Farmland character type beyond the site in the middle distance. In this panoramic view, the eye is drawn towards the site along the hedged path of the Hamstead Trail. The quarry and adjacent woodland is prominent in the view, as is Tapnell Farm further west (not visible on photograph). The land gradually falls towards the Solent, visible either side of Bouldnor Copse (the domed woodland in the centre of the view). The location is tranquil and the view is extensively rural in character, with limited development and few detracting features in the landscape. From this location, the mainland in the distance appears as an undeveloped wooded edge beyond the Solent.

11.21 *Predicted view:* the predicted view is illustrated by the photomontage in figure 11.1 (20 of 22). This shows that all six turbines are visible as an evenly spaced line in the middle distance, although the intervening landform and hedge along the Hamstead Trail obscures, to varying degrees, the lower sections of the towers of turbines 4, 5 and 6, in summer months. Both the switching station and meteorological mast are discernible in the view, but are not prominent features.

11.22 *Magnitude of change:* the nearest turbine is approximately 1.4km away and the furthest turbine is 1.8km from this viewpoint location. The turbines will occupy approximately 80^{o} of the overall view with the majority of the turbines visible. The tower of turbines will be visible in poor or better visibility, which occurs > 97% of the time in this area. Assuming excellent visibility and that the observer is being exposed to the view for the first time, the proximity and width of the array is such that the turbines will be prominent elements in the view and the magnitude of change will be *substantial.*

11.23 *Visual receptors*: the main receptors will be walkers, cyclists and horse riders. The recreational path is well used. All receptors will either be stationary or moving slowly in a nationally designated landscape of high quality (but looking towards a landscape of medium/ high quality). On this basis this location is likely to have a high sensitivity to change.

11.24 *Overall effect and significance:* a high sensitivity combined with the substantial magnitude of change give rise to an overall effect of major, which suggests that the development will result in a significant change in the view

for all types of receptors likely to experience this view. The impact is assessed as adverse.

Viewpoint 21: Footpath running south west from Elm Lane, north of Calbourne

11.25 *Location:* viewpoint 21 is from a footpath crossing a small field from Elm Lane in the north east to the B3401 in the south west. It is within the Rolling Farmland landscape type and lies just outside the AONB landscape to the south.

11.26 *Existing view*: the foreground is dominated by pasture farmland. The relatively elevated and panoramic view looks west across the Rolling Farmland character type. To the right of the telephone post, Shalcombe Down is just visible, whilst Westover Plantation forms the background to the view to the left. Although not shown in the photograph, properties on the northern edge of Calbourne are clearly visible from the footpath. To the right, properties in Newbridge are just visible, nestled in woodland. A series of intervening ridgelines truncates views of the site. The distant ridgeline in the centre of the view is exposed with limited vegetation.

11.27 *Predicted view:* the predicted view is illustrated by the photomontage in figure 11.1 (21 of 22). This shows that the turbines will be seen as a tight cluster in the middle distance beyond the central ridgeline. The meteorological mast is barely perceptible.

11.28 *Magnitude of change:* the nearest turbine will be approximately 3.1km away and the furthest turbine will be 4.5km away when viewed from this location. The turbines will occupy approximately 7^{o} of the overall view. The majority of the towers and the movement of the rotors will be visible against the sky. The turbine towers and rotors will be visible in moderate (at least 7km) or better visibility, which occurs > 92 % of the time in this area. Assuming excellent visibility and that an observer is being exposed to the view for the first time, the distance to and narrow array is such that the turbines will be visible elements in the view and the magnitude of change will be *moderate.*

11.29 *Visual receptors:* receptors will be farm workers and walkers. They are likely to be stationary or moving slowly in a landscape unit of high importance, although the viewpoint is located outside the AONB designation and is affected slightly by the abrupt housing edge to the south. On this basis, receptors in this location are likely to have a high/ medium sensitivity to change.

11.30 *Overall effect and significance:* the high/medium sensitivity combined with the moderate magnitude of change gives an overall effect of moderate+, which suggests that the proposal would result in a significant change in the view from this location. The impact is assessed as adverse.

Viewpoint 22: Lymington to Yarmouth Ferry, mid Solent

11.31 *Location:* viewpoint 22 is from the Solent on the Lymington to Yarmouth ferry. The view is from the open passenger deck at the front of the ferry.

11.32 *Existing view:* this is a 360^{o} panoramic view across the Solent to the Isle of Wight and mainland. The breadth of view is such that the receptor can gradually view the whole of the island and mainland peninsula at Hurst Castle as one large panoramic. At this mid-sea location, the sinuous outline of the Island against the sky tends to be the main feature of the view, although as the ferry draws closer to the island, Yarmouth becomes the focus of the view (see figure 11.2a: seascape viewpoint 4). Boats and yachts on the Solent and in Yarmouth Harbour are also prominent features in the view. The outline of the island is largely unbroken, except for the television mast near Swainstondown.

11.33 *Predicted view:* the predicted view is illustrated by the photomontage in figure 11.1 (22 of 22). This shows that all of the turbines will be visible, spaced out as a receding line which has the higher Chalk Down landscape and the sky as a background. The photomontage shows that, during certain weather conditions, turbines will be difficult to see when background by land. The meteorological mast is not perceptible in the view.

11.34 *Magnitude of change:* the nearest turbine will be approximately 4.7 km away and the furthest turbine will be 5.9km away. The turbines will occupy approximately 11^{o} of the overall view and will be seen against the higher land and sky, the upper parts of the towers and rotors breaking the skyline of the island. In viewing the photomontage, it must be remembered that in reality the view is constantly changing, with the focus switching, for example from yachts and boats on the Solent to the island itself. However, the turbine will become a visible feature in the view, especially when sunlit and seen against a dark sky. Assuming excellent visibility and that the observer is being exposed to the view for the first time (which will often be the case for holidaymakers), the distance and array of the turbines seen against the background of the island will be a visible element of the view and the magnitude of change will be *moderate*.

11.35 *Visual receptors:* will be ferry passengers, including holidaymakers, day visitors and residents of the island. On this basis, the location is likely to have a high/medium sensitivity to change for these receptors.

11.36 *Overall effect and significance:* the moderate magnitude of change combined with a high/ medium sensitivity gives rise to an overall *moderate+*. This assessment suggests that the turbines may give rise to a significant impact. However, given that the view will be experienced over a sustained length, this has been assessed as resulting in an overall *significant* impact. Nevertheless, in reaching this assessment it is worth noting that the capacity of the seascape to accommodate the change was considered to be large, and that at this distance the turbines will, during certain weather conditions,

merge with the landform of the island – refer to photomontage. The impact has been assessed as adverse.

11.37 The tables below provide a summary of the baseline visual analysis and residual visual impacts for each viewpoint.

No.	View-point	NGR	Approx. elevation (mAOD)	Direction of view to site	Nearest / furthest turbine (km)	Landscape unit / landscape designation	Number / extent of visible turbines	Array width (o)	Back-ground	Landscape / built context	Receptors	Sensitivity of location
19	Fenced tumili next to Tennyson	440625, 084725	203	NW	2.6/3.9	Chalk Down / AONB	6 / 5, 6 Sweep blades	18	Land / sea and sky	Large / minimal	Walkers, cyclists and horse riders	High
20	Hamstead trail by metal gate, south of B3399	438560, 085715	105	N	1.4 / 1.8	Chalk Down / AONB Heritage Coast	6 / all	80	Land / sea and sky	Large / minimal	Walkers, cyclists and horse riders	High
21	Footpath running south west from Elm Lane	442405, 087180	55	W	3.1 / 4.5	Rolling Farmland	6 / all as group	7	Sky	Large / housing on edge of Calbourne	Walker	Medium / high
											Farm workers	Medium / high
22	Lymingon to Yarmouth Farm, mid Solent	435575, 091450	9	SSE	4.7 / 5.9	Seascape	6 / all	11	Land / sky	Large / Yarmouth	Ferry passengers	High / medium

Table 11.1: results of baseline visual analysis

	Viewpoints	Receptor	Sensitivity of receptor	Magnitude of change	Overall effect	Nature	Level of certainty	Duration
Visual amenity	Viewpoint 19: fenced tumuli next to Tennyson	Walkers, cyclists and horse riders	High	Moderate	Major / moderate	Significant adverse	Reasonable	Long term / reversible
	Viewpoint 20: Hamstead trail by metal gate, south of B3399	Walkers, cyclists and horse riders	High	Substantial	Major	Significant adverse	Reasonable	Long term / reversible
	Viewpoint 21: footpath running south west from Elm Lane	Walkers and farm workers	Medium / high	Moderate	Moderate +	Significant adverse	Reasonable	Long term / reversible
	Viewpoint 22: Lymington to Yarmouth Farm, mid Solent	Ferry passengers	Medium / high	Moderate	Moderate+	Significant adverse	Reasonable	Long term / reversible

Table 11.2: predicted residual effects

Residential properties

11.38 To support the assessment for fixed viewpoint receptors (or properties), it was agreed with the IoWC that a supplementary *quantitative* assessment of properties within a 3km radius of the nearest turbine would be undertaken.

11.39 The purpose of the study was to assess *the number* of properties experiencing a significant change in their view within the 3km study area. The assessment is provided as supporting information, and should be read in conjunction with the assessment of fixed viewpoints in the landscape chapter of the ES and technical appendix.

11.40 This assessment was carried out in August 2006 by a qualified landscape architect, familiar with the proposals, site and the study area. The assessment followed the methodology set out in the landscape technical appendix. It was agreed that properties experiencing a similar view would be grouped, except for individual farmsteads or isolated properties. Potential views from gardens, the ground floor and upper floor(s) were assessed. The assessment was made by either looking from the site back towards the receptor, or from a public area in the locality of the receptor. For this reason, the quantitative assessment and description of view is approximate. Where considered appropriate, properties located just beyond the 3km radius that potentially would experience a significant change in the view were included.

Towns and large villages

11.41 The majority of Yarmouth lies outside the 3km radius from the nearest turbine, however, for completeness, the assessment considered the whole town. As noted in paragraph 8.155 of the landscape chapter of the ES, for most residents in Yarmouth, intervening buildings and/or vegetation will obscure views of the development. Potential views of the turbines will principally be from properties on the south eastern edge of the town. Approximately 16 properties at The Mount and Tennyson Close will have elevated views out across Thorley Brook toward the site and proposed turbines. Thorley Copse will partially obscure views of the turbines from this location to varying degrees, however, because of the elevated position and direction of view, these properties are assessed as experiencing a significant change in view.

11.42 Further south west, approximately 10 properties in Station Road and Heyesbury Road will have oblique views towards the site, although planting adjacent to the properties and interviewing woodland provides a dense screen from lower and upper floor windows. The angle of view and screening effect of the vegetation (including during winter months) limits views of the turbines. A significant change in the view is not assessed for these properties. To the west, Yarmouth Mill experiences a similar view to that of viewpoint 6 and is assessed as experiencing a significant change in the view.

11.43 Although outside the 3km radius, approximately 8 to 15 properties on the eastern edge of Norton will have elevated views across the River Yar Estuary

towards the site. Although some intervening vegetation provides a screen, these properties have been assessed as experiencing a significant change in their view because of their open aspect and the direction of view towards the site.

11.44 The majority of Freshwater lies outside the study area and therefore was not assessed. On the town's easternmost edge, approximately 28 properties along Copse Lane will have views of the site and the proposed turbines from primarily upper floor windows. Potential views of the turbines will be similar to viewpoint 5, where the turbines align behind one another. For the 16 properties on the western edge of Copse Lane, which have uninterrupted views from the front of the houses, a significant change of view was assessed. Vegetation in the rear gardens of the remaining properties on the eastern side of Copse Lane was assessed as providing a sufficient screen to limit potential views.

11.45 Properties further south in Afton and on the eastern edge of Freshwater were assessed, including those on Southdown Road and Manor Road where a combination of intervening topography and vegetation meant that potential views of the turbines would be mostly screened. No significant change to views was assessed, except for nearby isolated properties that are noted later.

Small villages

11.46 Wellow is the closest settlement to the site. It is predicted that 35 to 45 properties will experience a substantial change in the view. Of these, the degree to which the turbines will be visible varies considerably, ranging from open, direct and uninterrupted views of the turbines, such as from properties along the B3401 on the eastern edge of the village, to heavily screened view such as at Wellow Farm. However, because of the proximity of the turbines, even properties that will have heavily filtered views of all or some of the turbines have been assessed as experiencing a significant change. Views from many properties, especially those on the northern side of the B3401, will be screened by intervening buildings and vegetation and will therefore not experience a significant change in view.

11.47 Approximately 30 to 35 properties in Thorley have been assessed as experiencing a significant change in the view. This includes properties on the northern side of the B3401, at North View and on the eastern side of Holmfields. As at Wellow, despite intervening vegetation and the angle of view often limiting the extent of visibility, because of the proximity to the turbines (1.2km) the magnitude of change and impact has been assessed as significant.

11.48 To the north east, Ningwood and satellite properties along Station Road will be approximately 2km away. Many properties will have oblique, filtered or partially screened views of the turbines. However, gaps in vegetation cover afford direct views of the turbines for approximately seven properties, with a further seven to ten properties with filtered views experiencing a significant change due to their proximity.

11.49 To the north west of Ningwood, extensive woodland limits views towards the site, including properties in Cranmore, nearly all of which will remain unaffected as noted in paragraph 8.168 of the ES.

11.50 The majority of properties in Newbridge will experience no change in their view, being located on the east-facing slopes of a wooded valley. On the western edge of the village at the highest point, approximately 14 properties on or near the Main Road (B3401) will have views south west towards the site, mostly from upper floor windows. Their elevated location will afford views of the turbines, except where intervening vegetation provides a screen. Of these properties, Springhill Cottages and eight properties on the northern side of the Main Road will experience a significant change in the view. Vegetation and adjacent houses screen potential views of the turbines from nearby properties at Crossways.

11.51 At Calbourne, the alignment of the turbines is such that where visible the structures will occupy a small percentage of the total view. A total of 15 to 20 properties were assessed as experiencing a significant change in view. Of these, 12 properties at Elm Lane on the northern edge of the village will experience the largest magnitude of change. Views from these properties will be similar to viewpoint 21, although from upper floor windows at the rear of the properties the turbines will be slightly more prominent. Further south, other properties assessed as experiencing a significant change in view include Merlins Cottage, Old Piggery, Carbon and The Sun public house, all on Elm Lane, and Witchingberry Farm, south of the B3401. The oldest part of the village to the south gradually drops towards the valley bottom, limiting potential views of the turbines. Views from Westover Park, located in this hollow, will be largely screened by dense woodland and the intervening landform.

11.52 It is noted in paragraph 8.170 of the ES that properties in the new housing estate on the eastern edge of Shalfleet will potentially have significant views of the turbines. It is estimated that approximately 25 to 30 properties in this location will have oblique views from upper floor windows towards the site. However, abundant vegetation in the locality will significantly filter many of the views. It has not been possible to assess which of the properties noted above will experience a significant change in view.

11.53 To the north of the study area, up to 25 properties on the southern edge of Bouldner will have direct and elevated views south towards the site. The majority of these properties are assessed as experiencing a significant magnitude of change, the turbines being clearly visible.

11.54 The village of Chessell lies in a narrow valley, with a steep ridgeline to the north west screening views of the site. The ridgeline is devoid of vegetation, and therefore based on the ZVI mapping it is assessed that potential views of the turbines will be available from the village, except where vegetation on the edge of a property provides a screen. Six properties have been assessed as experiencing a significant change in the view, including detached and

semi-detached houses on Brook Road, Chessell Farm and Shalcombe Manor, although with the latter the main building is in a hollow and vegetation may screen views.

11.55 No views of the turbines will be available from properties in Brook.

Farmsteads and individual properties

11.56 The assessment of farmsteads and individual properties determined that, of the total number within the study area, the majority will either have no view or will not experience a significant change in the view because of localised topography and/or intervening vegetation. Properties in this category included nearly all the dwellings along Wilmingham Road, all properties south of Brook Down and numerous properties west of Calbourne. It should be noted that because of their often remote location, some distance from public areas, it was not possible to assess all properties in this category.

11.57 Within the study area, properties assessed as experiencing a significant change in the view included Afton Farm Cottages, Afton Thatch, Tideway Cottages, Barnfields Cottages, Thorley Manor, Little Chessell (if the turbines are visible beyond ridge), Churchill's Cottages and Churchill Farm.

11.58 A potential view of the turbines will be available from a side window of Dodpits House. Although the main orientation of the house is north and vegetation along Dodpits Lane provides a dense screen, the proximity of the turbines is such that a significant change in the view will result from this location.

11.59 To the south/ south west of the site, several properties including Freshwater Fruit Farm, Toll Gate Cottages, Tapnell Cottage, The Quarries and West Cottage potentially could experience a significant change in the view, but the presence of vegetation combined with localised topography made it difficult to assess these properties.

11.60 Shalcombe, Shalcombe Holdings and Prospect Cottages will all experience significant magnitude of change in the view.

Summary of property assessment

11.61 The supplementary quantitative assessment of properties provided as part of this Addendum reaffirms the assessment for fixed viewpoint receptors in the Environment Statement. Beyond approximately a 3 km radius, for the vast majority of receptors in towns, villages, small hamlets and individual settlements no view of the turbines will be available, or where visible, the magnitude of change will not be significant. Within a 3km radius, the quantitative assessment is summarised in table 9.13. It worth noting that within the context of West Wight, the total number of properties potentially significantly affected is a small percentage of the overall total.

Residential properties	Approximate number of fixed receptors experiencing a significant change in view
Towns and large villages	• 16 properties at The Mount and Tennyson Close will have elevated views out across Thorley Brook toward the site and proposed turbines • Yarmouth Mill • Approx 8-15 properties on the eastern edge of Norton will have elevated views across the River Yar estuary towards the site • 28 properties along Copse Lane will have views of the site and proposed turbines from primarily upper floor windows. Approx Total = 60
Small villages	• 35- 45 properties at Wellow settlement will experience a substantial change in view • 30- 35 properties in Thorley have been assessed as experiencing a significant change in view. • Approx 7 properties and a further 7 – 10 with filtered views will also experience a significant change due to their proximity • 14 properties on or near the Main Road (B3401) will have views south west towards the site (Of these properties, Springhill Cottages and 8 properties on the northern side of the Main road will experience a significant change in view). • 25 properties on the southern edge of Bouldner will have direct and elevated views south towards the site. • 6 properties in Chessell lies in narrow valley, have been assessed as experiencing a significant change in view Approx Total = 134
Farmsteads and individual properties	• Afton Farm Cottages • Afton Thatch • Tideway Cottages • Barnfields Cottages • Thorley Manor • Little Chessell (if turbines visible beyond ridge) • Churchill's Cottages • Churchill Farm • Shalcombe • Shalcombe Holdings • Prospect Cottages • Approx Total = 11 • Note: Not all individual properties were assessed (refer to main text).

Table 11.3: 3km quantitative assessment

Copse and switching station

11.62 A small copse is proposed adjacent to the switching station to help assimilate the building into the landscape. Figure 11.5 shows the size and shape of the proposed copse. Plant species will comprise native trees and shrubs, being mostly deciduous and of local provenance.

11.63 The switching station has been included on all photomontages, where visible. In producing the photomontages, it was assumed that the roof of the switching station would be constructed from aluminium with a mill finish. This material will, after a relatively short period of time, weather to a dull

matt grey colour. The roofing material was chosen to replicate farm outbuildings in the vicinity, many of which have corrugated roofs. In elevated views, principally from the Chalk Downs, the switching station will appear as part of the isolated farmsteads, a characteristic of the Open Farmland landscape type. The photomontage for viewpoint 4 from Crompton Downs Golf Course helps to illustrate this design intent. It was assumed that the walls of switching station would be constructed of buff / sand coloured brickwork.

11.64 It was agreed with the IoWC that the final external colours and materials to be used for the switching station will be conditioned.

Existing vegetation and permanent tracks

11.65 Potential loss of hedgerow predicted as part of the construction phase has been clarified in the proposals section of this Addendum. No hedgerows will be lost.

11.66 It is confirmed that where permanent tracks are proposed adjacent to the existing woodland, namely Hummet Copse and the smaller copse to the east, they will be aligned at a sufficient distance to avoid damage to tree roots. Construction of the permanent tracks will be carried out in accordance with BS 5837:2005 *Trees in Relation to Construction – Recommendations*. The permanent track will be surfaced using locally sourced aggregate, its colour and surface finish chosen to reflect local character and to minimise the tracks' visual prominence in the landscape, in particular in local views from nearby public rights of way. The edge of the track will be topsoiled, married back with existing levels and then seeded.

11.67 It is assumed that the surface material used for the construction of the permanent track will be formally agreed with the IoWC as part of satisfying conditions accompanying a planning consent.

Turbine colour

11.68 The finish and colour of the turbines will be agreed with the IoWC. For the purpose of the assessment it has been assumed that they will be light grey (RAL 7035) with a semi-matt finish. Light grey is a standard colour used for turbines, and was considered appropriate to this site where the turbines would often be viewed in the context of a relatively open landscape devoid of vegetation, and will have a combination of land, sea and sky as a background.

11.69 As part of consultation on the proposals, the IoWC requested that alternative colour treatments be considered, including the potential use of horizontal banding such as green to grey/white. In this location it was concluded that if colour banding was to be used a beige colour at the base of the tower, rather than green, would be more appropriate given open farmland in the vicinity. However, analysis of the representative viewpoints concluded that the turbines would be viewed against a large number of differing

landscape/seascape character types, and that in this context a 'neutral' single colour, such as light grey, is most appropriate. The single light grey colour was not only considered to be most appropriate when viewed against a background of mostly sky (see viewpoint 1), but in views from the Chalk Downs and coastline, the light grey colour was considered to have some resonance with the characteristic patches of white/light grey of the exposed chalk or breaking waves (see viewpoints 11, 17 and 19).

Zone of visual influence and viewpoints plan

11.62 Figures 8.7a and 8.7b have been substituted with new plans (figure 11.3 and 11.4) and can be referred to at the end of this chapter. The changes include enhancing the graphic and adding the location of the additional viewpoints provided as part of this Addendum. It should be noted that the zone of visual influence shown on the plan remains identical to that previously submitted.

Tranquillity map

11.63 Tranquillity Area maps produced on behalf of the Campaign for the Protection of Rural England (CPRE) and the Countryside Commission, and referred to as part of the landscape and visual assessment, are provided at the end of this chapter (figure 11.6).

Overview and conclusion

11.64 In undertaking the supplementary assessment work as part of this Addendum, a review of the assessment for landscape fabric, landscape character/seascape and landscape designation was undertaken, and is set out below. At the same time, the IoWC sought clarification and further justification of the broad landscape conclusions arising from the assessment: this is also addressed in the following text.

Landscape fabric

11.65 The assessment of effects on landscape fabric remains unaltered. Potential concerns raised by the IoWC with respect to impacts on site vegetation have been addressed earlier in this section.

Landscape character

11.66 The impacts assessed for the Open Farmland (type 6) and Chalk Downs (type 1 and LCT1) remains *substantial*, as set out in the Environmental Statement. Viewpoint 20 is within the Chalk Down landscape type, from the Hamstead Trail at the base of Compton Down. As for viewpoint 4, the size and array of the turbines is such that they will become a defining characteristic in views.

11.67 Viewpoint 19 is from Brighstone Down to the south east of the site. From this location, the turbines will become another focal point in the view, along with the tumuli, chalk cliffs, wooded hills, the chalk pathway of the

Tennyson Trail, disused quarries, the sea and the rolling elevated downland. In this context, the turbines will become one of many features in views from this landscape, but not the defining characteristic. As a whole, the sense of remoteness and tranquil setting of this part of the Chalk Down landscape is not considered to be significantly affected, with potential views of the turbine often obscured by a combination of woodland and landform.

11.68 Viewpoint 21 is from within the Rolling Farmland landscape type. The assessment in the Environmental Statement (paragraph 8.106), that the turbines will become a defining characteristic of the landscape is illustrated by the photomontage. However, field observation confirmed that zones of visibility are both limited and fragmented, and, for the landscape unit as a whole the magnitude of change is still assessed as small/medium.

11.69 Viewpoint 22 is from mid Solent on the Lymington to Yarmouth ferry. In paragraph 8.239 of the Environmental Statement it states that the turbines will become a prominent new feature in views from the Solent. It is considered that the new viewpoint from the Solent demonstrates that the turbines will be visible, but not prominent new features as assessed previously. Furthermore, whilst the assessment concludes that a significant change in the view will occur, the breadth of view and the constantly changing nature of the seascape is such that the turbines will be one of numerous features and not a defining characteristic. Although the blades of the turbines break the skyline of the island, the siting of the turbines on low-lying land means that they do not detract significantly from the sinuous outline of the island (considered to be a defining characteristic of the view). It is also of particular relevance to note that the Solent seascape has the capacity to accommodate the turbines and will reduce the potential effects on the visual amenity and character.

Landscape Designation

11.70 The assessment for the New Forest National Park remains unaltered (see paragraphs 8.133 – 8.135 of the ES).

11.71 The assessment of impacts on the Isle of Wight AONB and Heritage Coast is set out in paragraphs 8.136 – 8.143 of the Environmental Statement. Although the proposals will result in significant impacts to specific parts of the designated landscape, a comparison of the ZVI with the boundary of the Isle of Wight AONB clearly demonstrates that a majority of the designated landscape will remain completely unaffected by the proposal. Furthermore, although sections of the AONB landscape are significantly affected (most noticeably Crompton Downs where the proposals will become a defining characteristic), such adverse effects are limited when considered in the context of the island as a whole. Many of the landscape character units within the AONB and Heritage Coast will either experience no change or a moderate/slight impact, including the Greensand Hills, Sandstone Hills and Gravel Ridges, Bays, Soft Cliffs, Northern Cliffs, Estuaries, the Undercliff and Osbourne Coast. Large sections of the Chalk Downs landscape type, principally in the eastern half of the island, will also remain unaffected by

the proposals. When considered in this context, the conclusion that the ability of AONB landscape to achieve its statutory purpose is not significantly affected, as concluded in paragraph 8.141 of the ES, is borne out by the landscape and visual assessment.

Existing View

Predicted View

The sixth turbine is immediately to the left of this view concealed by the main part of this evergreen tree.

The meteorological mast is concealed by this building

Viewpoint grid reference:	438635E 088155N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 23 m AOD	Number of turbine tips (hubs) visible:	5 (5)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	1.0 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 1 of 22 Wellow Millenium Green, adjacent to B4301 (Summer & photomontage)

Existing View

Predicted View

Viewpoint grid reference:	438335E 086120N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 79 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	1.0 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 2 of 22 B3399, west of Shalcombe (Summer & photomontage)

Viewpoint grid reference:	437530E 088665N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 11 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	1.4 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

Predicted View

Viewpoint grid reference:	436865E 085735N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 129 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	1.9 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 4 of 22 Tennyson Trail on Compton Down Golf Course (Summer & photomontage)

Existing View

Predicted View

Viewpoint grid reference:	434700E 088440N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75°.
Viewpoint elevation:	c. 12 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	3.3 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Viewpoint grid reference:	435195E 089575N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 3 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	3.5 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 6 of 22 Bridge over River Yar, Yamouth (Summer & photomontage)

Existing View

Predicted View

Viewpoint grid reference:	441775E 090910N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 3 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	4.6 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 7 of 22 Newtown National Nature Reserve (Summer & photomontage)

Existing View

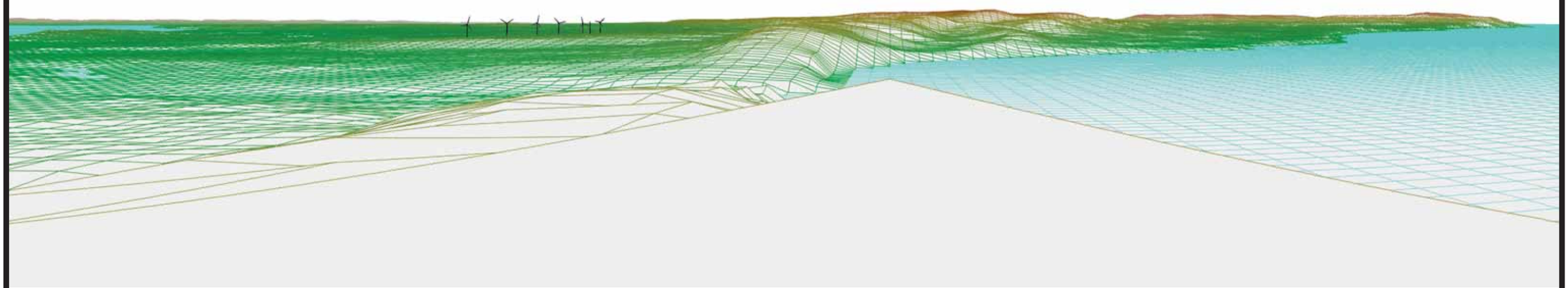
Predicted View

Viewpoint grid reference:	444170E 085975N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 159 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	5.0 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 8 of 22 Swainstondown Gate (Summer & photomontage)

Existing View

Predicted View

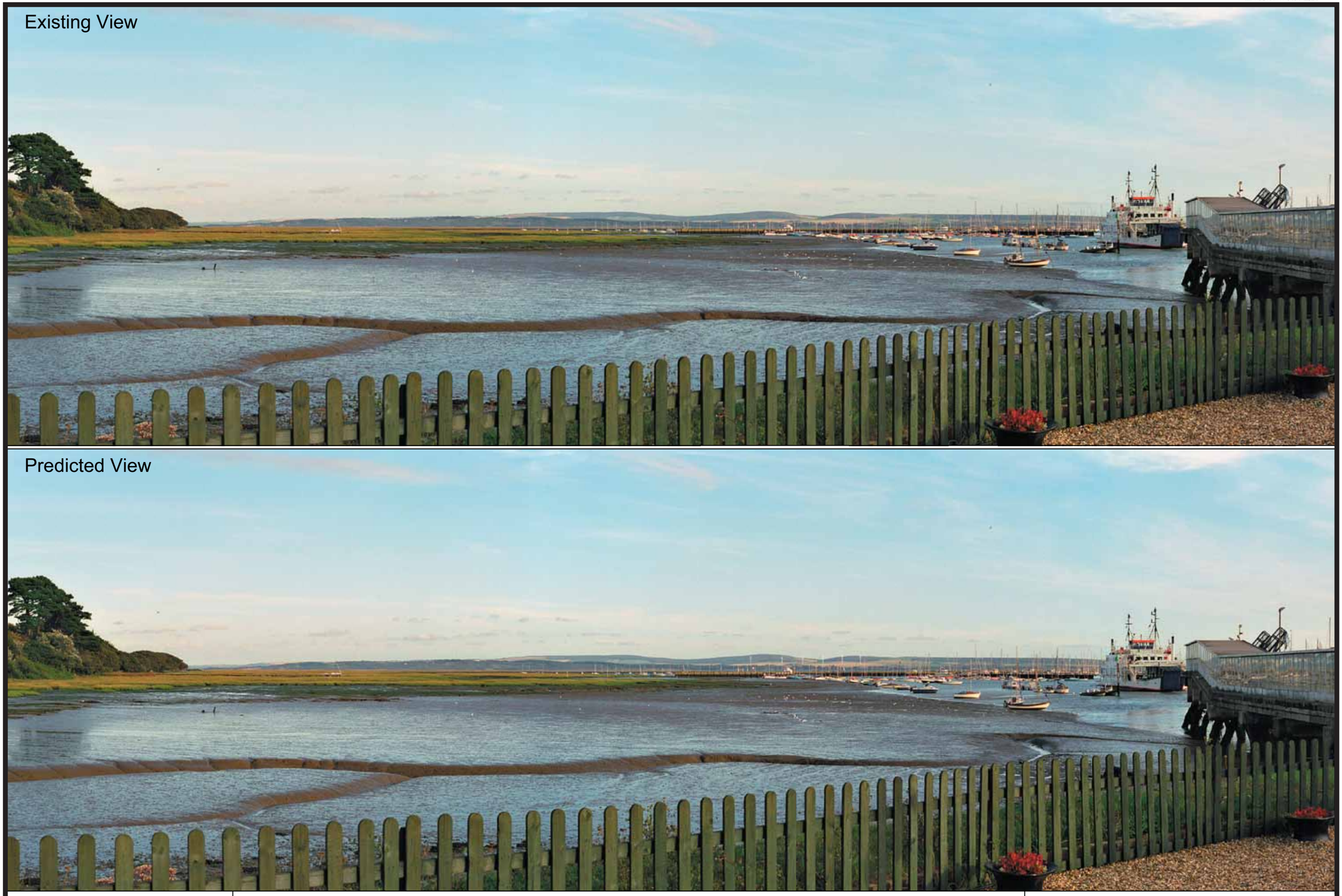


Viewpoint grid reference:	432560E 085355N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c.143 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	5.7 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 9 of 22 Tennyson's Monument, Tennyson Down (Summer & wireframe)

Existing View

Predicted View



Viewpoint grid reference:	433335E 095415N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 3 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	9.2 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

Predicted View

Viewpoint grid reference:	429310E 091215N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 1 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	9.4 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 11 of 22 Seafront at Milford on Sea (Summer & photomontage)

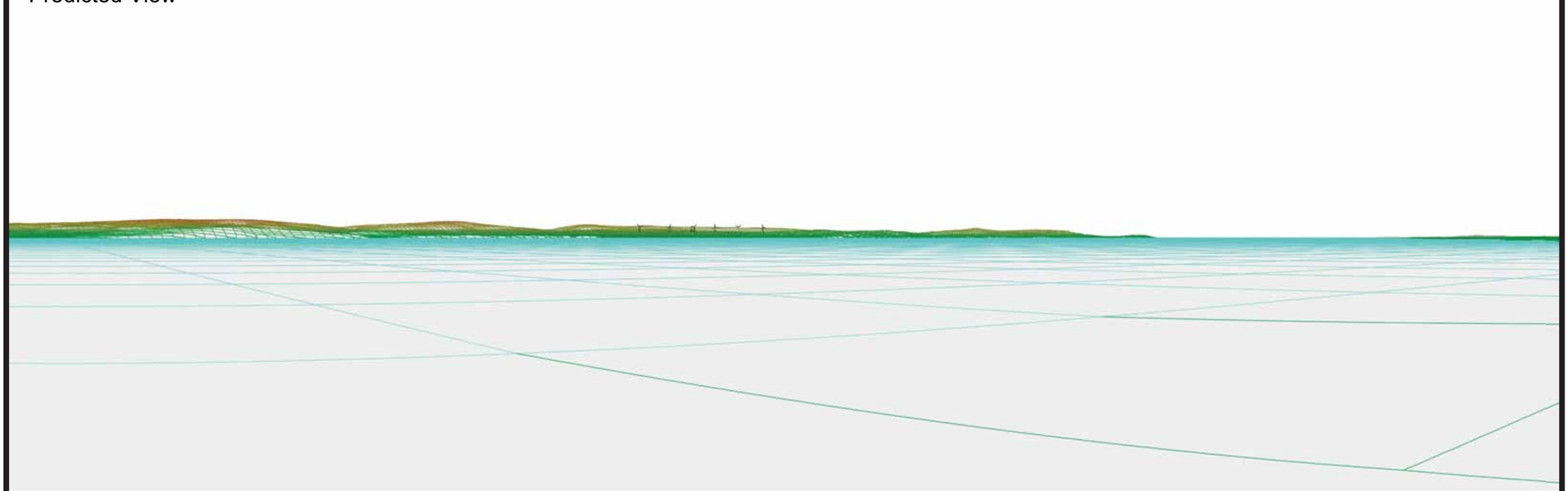
Existing View

Predicted View

Viewpoint grid reference:	448950E 093365N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 63 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	11.6 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

Predicted View

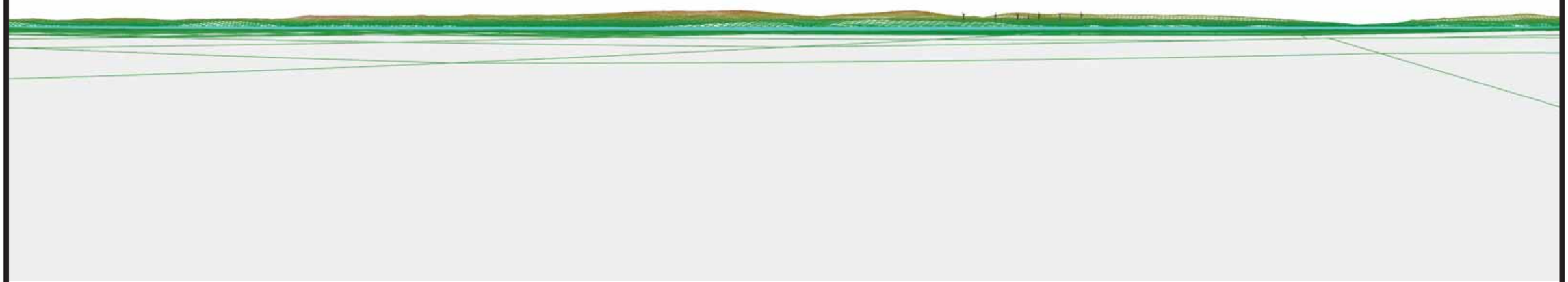


Viewpoint grid reference:	445526E 098512N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 6 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	13.0 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Figure 11.1 : Viewpoint 13 of 22 Stone Point, Lepe Country Park (Summer & wireframe)

Existing View

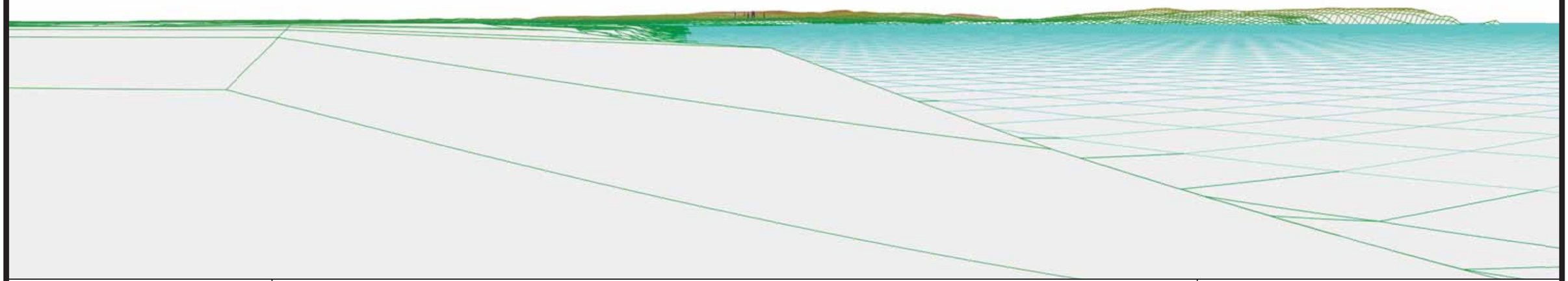
Predicted View



Viewpoint grid reference:	435755E 100405N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 41 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	13.2 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

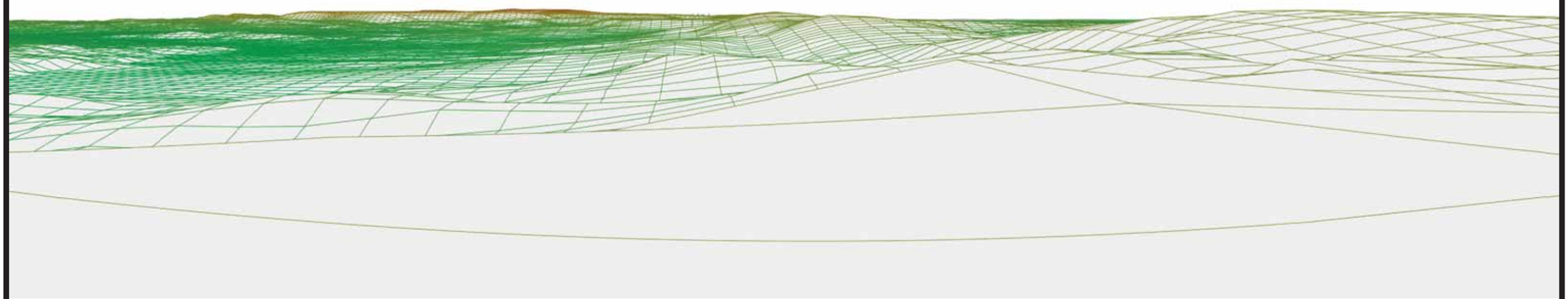
Predicted View



Viewpoint grid reference:	423935E 092950N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 31 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	15.0 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

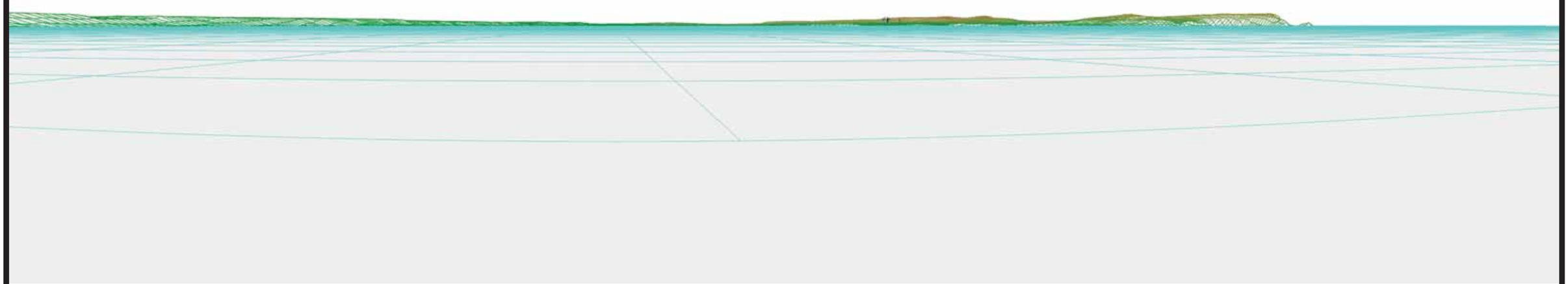
Predicted View



Viewpoint grid reference:	458470E 86970N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c.124 m AOD	Number of turbine tips (hubs) visible:	6 (0)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	19.2 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

Predicted View



Viewpoint grid reference:	418505E 091805N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 3 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	19.9 km	Height of camera above ground:	c. 1.5 m		3. Photography by E4environment Ltd.

Existing View

Predicted View

Viewpoint grid reference:	423764E 111019N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75°. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 106 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	27.5 km	Height of camera above ground:	c. 1.5 m		3. Photography by Ben Osborne (www.benosbornephotography.co.uk)

Figure 11.1 : Viewpoint 18 of 22 New Forest, near A31(T) (Summer & wireframe)

Existing View

Predicted View

Viewpoint grid reference:	440625E 84725N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c.203 m AOD	Number of turbine tips (hubs) visible:	5 (5)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	2.9 km	Height of camera above ground:	c. 1.5 m		3. Photography by Ben Osborne (www.benosbornephotography.co.uk)

Figure 11.1 : Viewpoint 19 of 22 Fenced tumuli next to Tennyson Trail Harboro/Mottistone Down (Summer & photomontage)

Your Energy

Viewpoint grid reference:	438560E 85715	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 107 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	1.4 km	Height of camera above ground:	c. 1.5 m		3. Photography by Ben Osborne (www.benosbornephotography.co.uk)

Figure 11.1 : Viewpoint 20 of 22 Hamstead Trail by metal gate, south of B3399 (Summer & photomontage)

Your Energy

Existing View

Predicted View

Viewpoint grid reference:	442405E 87180N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 57 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	3.1 km	Height of camera above ground:	c. 1.5 m		3. Photography by Ben Osborne (www.benosbornephotography.co.uk)

Figure 11.1 : Viewpoint 21 of 22 Footpath running south west from Elm lane (Summer & photomontage)

Viewpoint grid reference:	435575E 91450N	Turbine blade tip height:	100 m	NOTES	1. The horizontal angle of view is 75º. Monocular perspective could best be obtained by viewing from a distance of 300 mm, curved through 75º.
Viewpoint elevation:	c. 6.5 m AOD	Number of turbine tips (hubs) visible:	6 (6)		2. Digital photo preparation and montage by P D Marsh (www.pdmarsh.co.uk)
Distance to nearest visible turbine:	4.7 km	Height of camera above ground:	c. 1.5 m		3. Photography by Ben Osborne (www.benosbornephotography.co.uk)

Figure 11.1 : Viewpoint 22 of 22 Lymington to Yarmouth Ferry, mid solent (Summer & photomontage)

Viewpoint 1 Wellow Millennium Green, adjacent to B4301

Viewpoint grid refernce	:	438635E 088155N
Viewpoint elevation	:	c. 23m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 2 B3399, West of Shalcombe

Viewpoint grid refernce	:	438335E 086120N
Viewpoint elevation	:	c. 79m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 3 Thorley Church gate

Viewpoint grid refernce	:	437530E 088665N
Viewpoint elevation	:	c. 11m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 4 Tennyson Trail on Compton Down Golf Course

Viewpoint grid refernce	:	436865E 085735N
Viewpoint elevation	:	c. 129m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 5 Freshwater Way near Kings Manor Farm

Viewpoint grid reference	:	434700E 088440N
Viewpoint elevation	:	c. 12m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 6 Bridge over River Yar, Yarmouth

Viewpoint grid refernce	:	435195E 089575N
Viewpoint elevation	:	c. 3m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 7 Newtown National Nature Reserve

Viewpoint grid refernce	:	441775E 090910N
Viewpoint elevation	:	c. 3m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 8 Swainstondown Gate

Viewpoint grid refernce	:	444170E 085975N
Viewpoint elevation	:	c. 159m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 9 Tennyson's Monument, Tennyson Down

Viewpoint grid reference	:	432560E 085355N
Viewpoint elevation	:	c. 143m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 10 Ferry Terminal, Lymington

Viewpoint grid refernce	:	433335E 095415N
Viewpoint elevation	:	c. 3m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 11 Seafront at Milford on Sea

Viewpoint grid refernce	:	429310E 091215N
Viewpoint elevation	:	c. 1m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 12 Northwood, Cowes

Viewpoint grid refernce	:	448950E 093365N
Viewpoint elevation	:	c. 63m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 13 Stone Point, Lepe Country Park

Viewpoint grid refernce	:	445526E 098512N
Viewpoint elevation	:	c. 6m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 14 Beaulieu Heath, New Forest

Viewpoint grid refernce	:	435755E 100405N
Viewpoint elevation	:	c. 41m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 15 Seafront at Barton-on-Sea

Viewpoint grid refernce	:	423935E 092950N
Viewpoint elevation	:	c. 31m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 16 Brading Down

Viewpoint grid refernce	:	485470E 86970N
Viewpoint elevation	:	c. 124m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Viewpoint 17 Mudeford Quay, Christchurch

Viewpoint grid refernce	:	416505E 091805N
Viewpoint elevation	:	c. 3m AOD
Date	:	27 April 2006
Season	:	Winter / Spring

Viewpoint 18 New Forest, near A31(T)

Viewpoint grid refernce	:	423764E 111019N
Viewpoint elevation	:	c. 106m AOD
Date	:	27 April 2006
Season	:	Winter/Spring

Seascape Viewpoint 1 : Lymington Harbour

Time : 8.15
Grid Reference : 433345E 095322N
Elevation : c. 9m AOD

Note: 1: Seascape photographs were taken with a 50mm lens
2: Photographs have been included as they were processed without modification.

Seascape Viewpoint 2 : Mid sea

Time : 8.25
Grid Reference : 434287E 093932N
Elevation : c. 9m AOD

Note: 1: Seascape photographs were taken with a 50mm lens
2: Photographs have been included as they were processed without modification.

Figure 11.2a : Lymington to Yarmouth ferry viewpoint 1/2 (seascape winter/spring)

Seascape viewpoint 3 : Mid sea

Time : 8.35
Grid Reference : 434970E 091459N
Elevation : c. 9m AOD

Note: 1: Seascape photographs were taken with a 50mm lens
2: Photographs have been included as they were processed without modification.

Seascape viewpoint 4 : Yarmouth Harbour

Time : 8.40
Grid Reference : 435279E 090064N
Elevation : c. 9m AOD

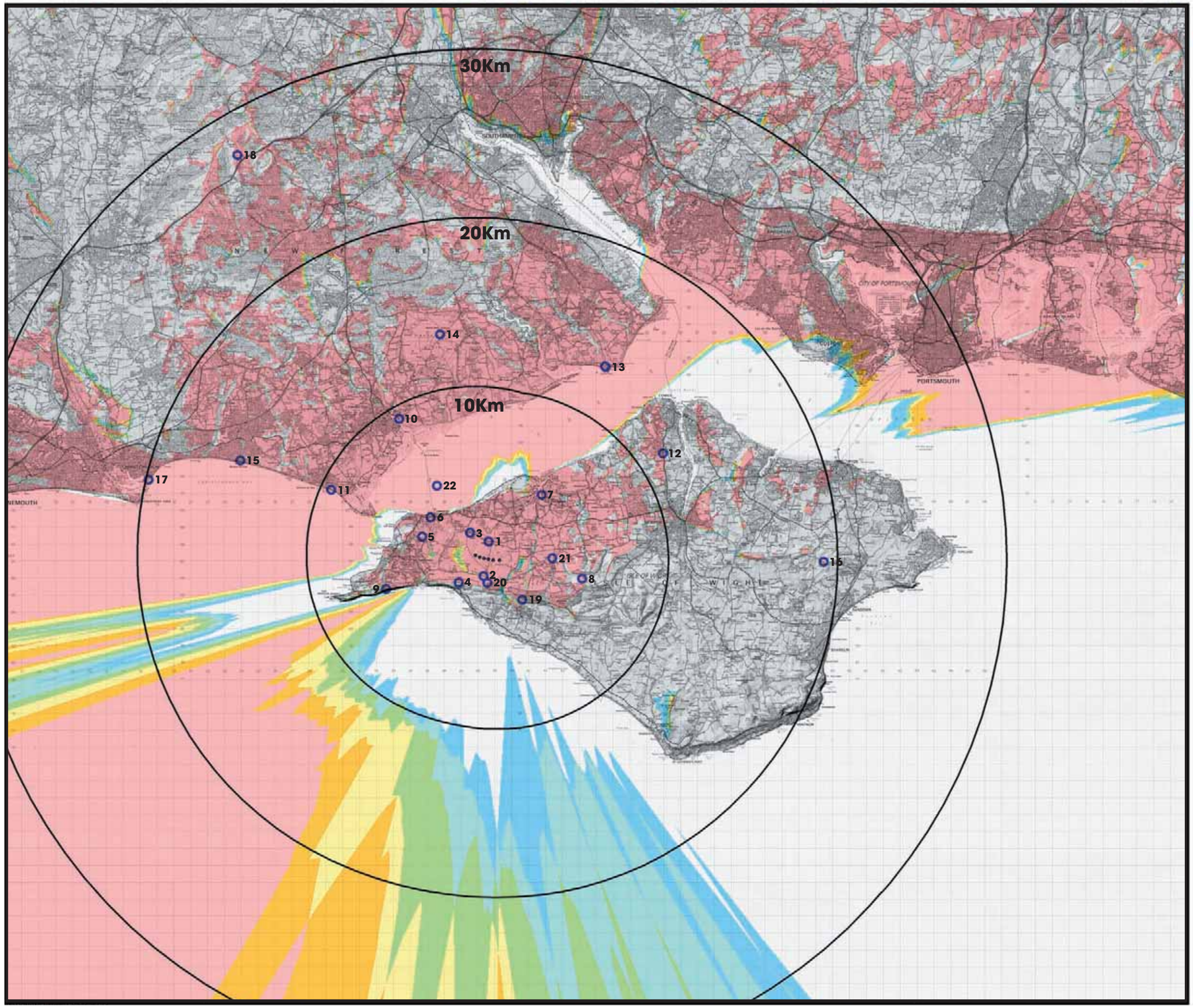
Note: 1: Seascape photographs were taken with a 50mm lens
2: Photographs have been included as they were processed without modification.

Seascape viewpoint 5 : Mid sea

Time : 19.40
Grid Reference : 449170E 098870N
Elevation : c. 11m AOD

Note: 1: Seascape photographs were taken with a 50mm lens
2: Photographs have been included as they were processed without modification.

Seascape Viewpoint Location Plan (no scale)



● Location of turbines

○ 14 Viewpoint Locations

Number of Turbines Visible (Blade Tip)

1 4
2 5
3 6

Vpt 1 Wellow Millenium Green, adjacent to the B4301.
Vpt 2 B3399 near Shalcombe.
Vpt 3 Thorley Church Gate.
Vpt 4 Compton Down Golf Course/Tennyson Trail.
Vpt 5 Freshwater Way, north of Kings Manor Farm.
Vpt 6 Yarmouth Bridge.
Vpt 7 Newtown National Nature Reserve.
Vpt 8 Swainstondown Gate.
Vpt 9 Tennyson's Monument.
Vpt 10 Isle of Wight Ferry Terminal, Lymington.
Vpt 11 Milford on Sea.
Vpt 12 Northwood Cowes.
Vpt 13 Stone Point, Lepe Country Park.
Vpt 14 B3055 New Forest.
Vpt 15 Barton on Sea.
Vpt 16 Brading Down.
Vpt 17 Mudeford Quay.
Vpt 18 New Forest near the A31(T).
Vpt 19 Harboro / Mottistone Down.
Vpt 20 Hamstead trail.
Vpt 21 Footpath Elm Lane.
Vpt 22 Lymington to Yarmouth Ferry (mid solent).

Note:

1. Predicted visibility is for observer eye level 1.6m above ground level.
2. The analysis does not take into account the screening effects of vegetation, buildings or other surface features.
3. Created using Ordnance Survey digital terrain data on a 50m grid.
4. Visibility analysis by P D Marsh (www.pdmarsh.co.uk)

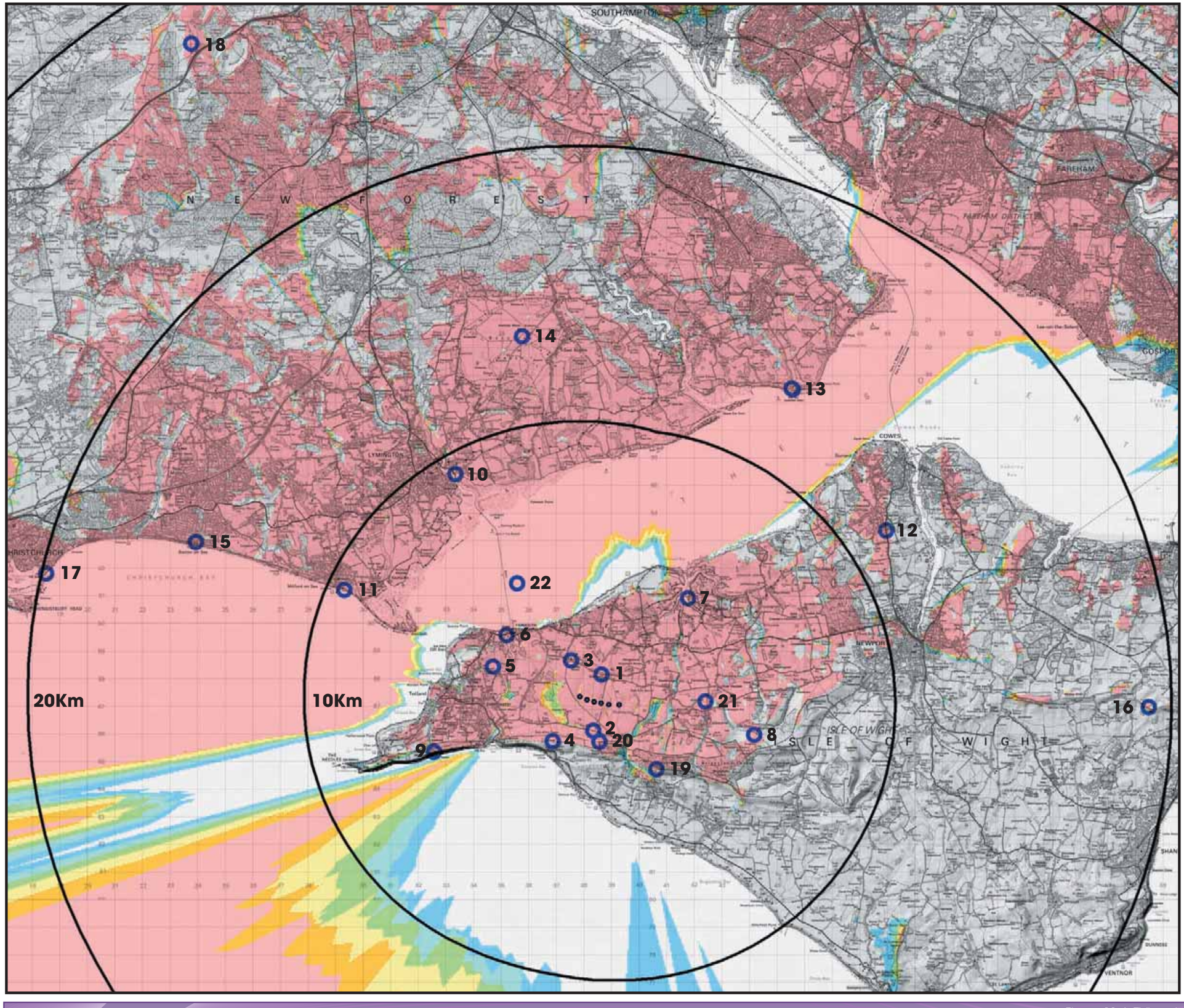
0 2 4 6 8km

NORTH

SINCLAIR KNIGHT MERZ SKM

Figure 11.3 : ZVI and viewpoint locations (tip height, 30km radius)

Your Energy



● Location of turbines

14 Viewpoint Locations

Number of Turbines Visible (Blade Tip)

1 4
2 5
3 6

Vpt 1 Wellow Millenium Green, adjacent to the B4301.
Vpt 2 B3399 near Shalcombe.
Vpt 3 Thorley Church Gate.
Vpt 4 Compton Down Golf Course/Tennyson Trail.
Vpt 5 Freshwater Way, north of Kings Manor Farm.
Vpt 6 Yarmouth Bridge.
Vpt 7 Newtown National Nature Reserve.
Vpt 8 Swainstondown Gate.
Vpt 9 Tennyson's Monument.
Vpt 10 Isle of Wight Ferry Terminal, Lymington.
Vpt 11 Milford on Sea.
Vpt 12 Northwood Cowes.
Vpt 13 Stone Point, Lepe Country Park.
Vpt 14 B3055 New Forest.
Vpt 15 Barton on Sea.
Vpt 16 Brading Down.
Vpt 17 Mudeford Quay.
Vpt 18 New Forest near the A31(T).
Vpt 19 Harboro / Mottistone Down.
Vpt 20 Hamstead trail.
Vpt 21 Footpath Elm Lane.
Vpt 22 Lymington to Yarmouth Ferry (mid solent).

Note:

1. Predicted visibility is for observer eye level 1.6m above ground level.
2. The analysis does not take into account the screening effects of vegetation, buildings or other surface features.
3. Created using Ordnance Survey digital terrain data on a 50m grid.
4. Visibility analysis by P D Marsh (www.pdmarsh.co.uk)

0 1 2 3 4 5km

NORTH

SINCLAIR KNIGHT MERZ
SKM

Figure 11.4: ZVI and viewpoint locations (tip height, 20km radius)

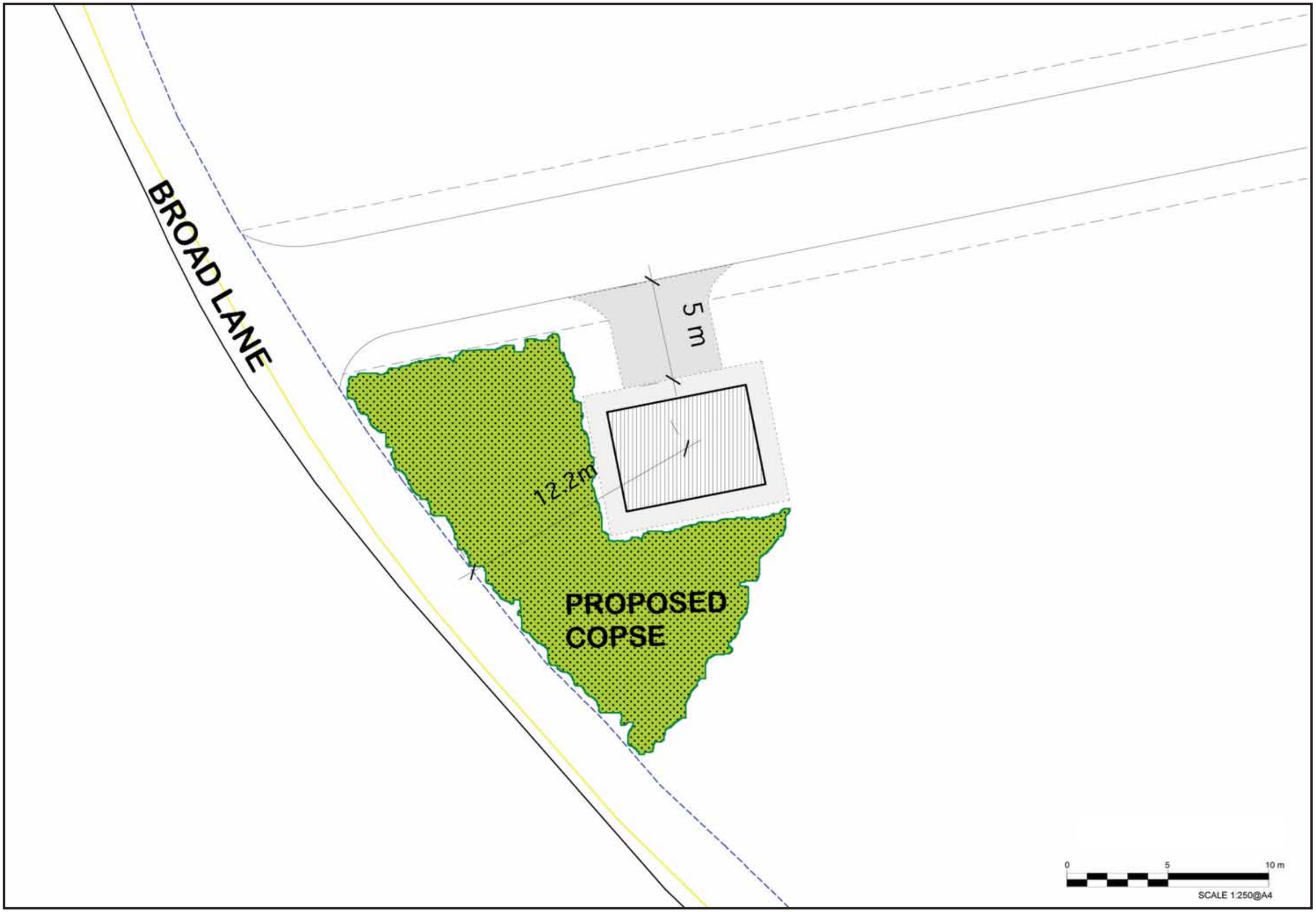


Figure 11.5 : Switching station and copse layout and positioning

Early 1960s

Early 1990s

KEY

Urban areas

Tranquil areas

Semi-tranquil areas

Vulnerable

Less vulnerable

N

CPRE

COUNCIL FOR THE PROTECTION OF RURAL ENGLAND

COUNTRYSIDE COMMISSION

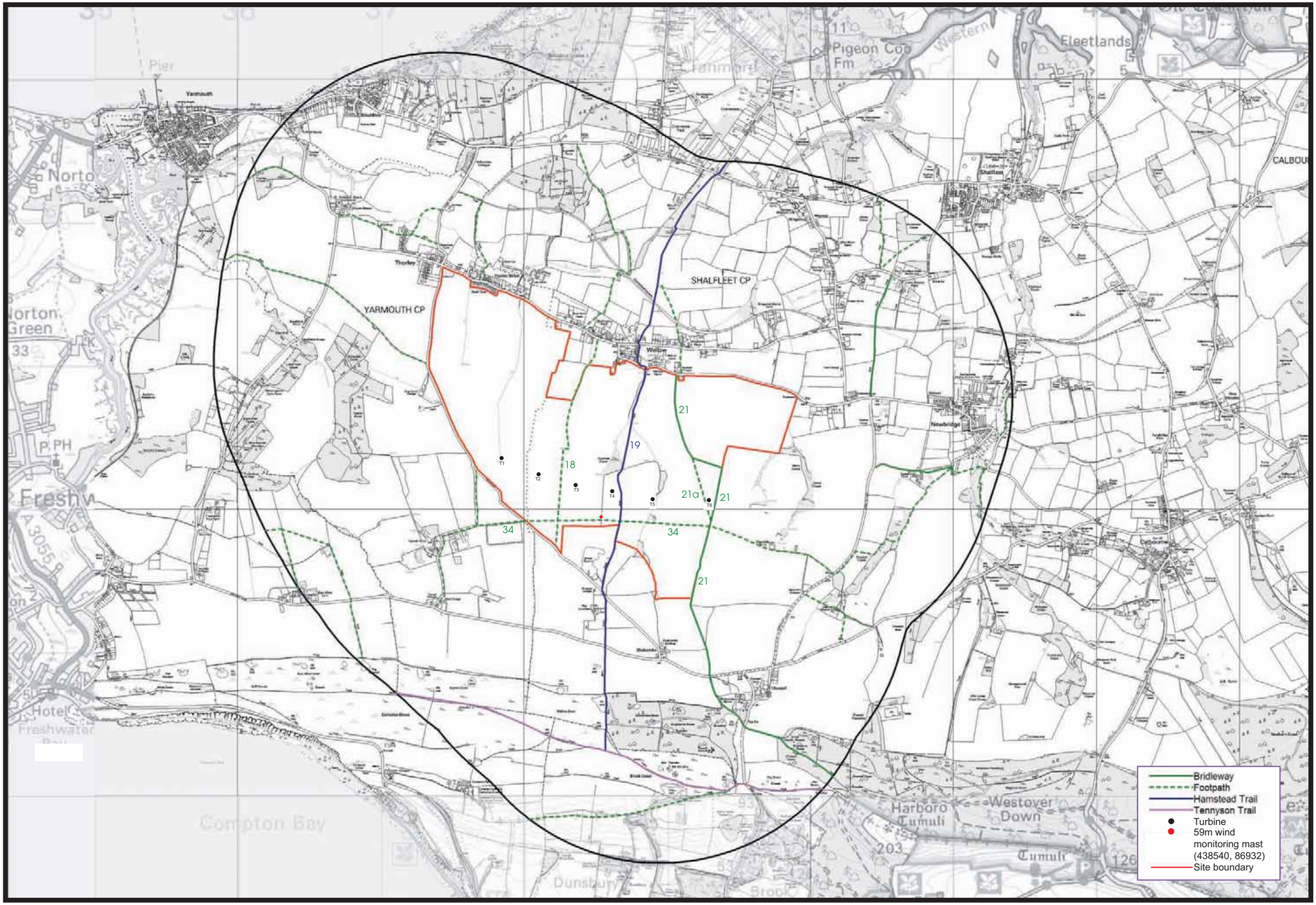
Figure 11.6 : Tranquility map (This is an extract taken from the South East Regional tranquility map produced by Countryside Commission 1995) - CPRE

12. Land use, community and social effects

12.1 Requests have been made to include the turbines on figure 9.8 of the ES. This modification has been made on figure 12.1 presented at the end of this chapter. It shows all public rights of way within the development boundary; these are now shown in relation to the turbine and meteorological mast positions.

12.2 Although not categorically stated in the ES, no diversions or closure of public rights of way across the site are planned during either the construction or operational phase of the development. It is acknowledged that the access roads cross public rights of way at three points on the site. During construction and maintenance visits, banksmen will be employed to maintain the safety of users of these rights of way with respect to vehicle movements along the tracks. Details of this will be included in the construction management plan submitted and agreed with the IoWC before any construction work begins.

12.3 Given the current close proximity of wind turbines to existing public rights of way, a strategy will be determined as part of a condition or legal agreement with the IoWC. This strategy will ensure that the maximum practical separation is achieved between turbines and rights of way, taking account of the interests of the users of the rights of way and the operation of the surrounding land as a working farm.



1735.02e

Figure 12.1 : Public Rights of Way within development boundary

13. Noise and vibration

13.1 The IoWC raised several technical points on the noise assessment, all of which are covered in the following paragraphs.

13.2 The use of the ETSU-R-97 guidance was questioned with regard to its adequacy for assessing the noise impact of the proposed wind farm. This point especially relates to addressing the effects of wind shear (the Van der Berg effect). Whilst it is acknowledged that the ETSU-R-97 model has its limitations, PPS22 is explicit in its advice regarding the assessment of noise emanating from wind energy developments. Paragraph 22 states:

"Renewable technologies may generate small increases in noise levels (whether from machinery or from associated sources – for example, traffic). Local planning authorities should ensure that renewable energy developments have been located and designed in such a way as to minimize increases in ambient noise levels. Plans may include criteria that set out the minimum separation distances between different types of renewable energy projects and existing developments. The 1997 report by ETSU for the Department of Trade and Industry should be used to assess and rate noise from wind energy development."

13.3 The second issue raised during consultation refers to paragraph 10.23 of the ES, and specifically to the discrepancy between the range of wind speeds measured and those required by the ETSU-R-97 guidance. The guidance states that wind speeds up to 12m/s should be examined, but the proposals are only assessed to 9m/s.

13.4 The limits placed on the wind speeds analysed were dependent upon available acoustic information for the turbine, which only extends to 9 m/s. It is generally recognised in the wind industry that noise levels for/from turbines do not significantly increase above those generated at 9m/s. It is also notable that during the noise monitoring period, wind speeds did not regularly exceed 10m/s.

13.5 From examination of charts in figures 10.3 to 10.6 of the noise assessment in the ES, which show predicted turbine and background noise against wind speed, the following conclusions may be reached.

a) The predicted turbine noise produced for the low gear and high gear settings levels off between 6m/s and 7m/s (low gear) and between 8m/s and 9m/s (high gear). Given this leveling effect, it is predicted that noise produced from the turbines will not increase significantly above the level shown 9m/s.
b) Additionally, from the same ES figures, it can be seen that the noise criteria curves increase with wind speed, reflecting the fact that increased wind speed gives rise to increased background noise levels.

13.6 Clarification on the conclusions of the effects during operation has been requested. Table 13.1 presents each of the sensitive receptors used in the assessment and compares the levels predicted at each location against the noise criteria derived in accordance with the ETSU guidance.

Modification of ES

13.7 Figure 10.1 of the ES is to be substituted by figure 13.1, which is found at the end of this chapter. The substitution is requested because the original figure did not show Hartshole Cottage on the plan, despite it being included in the assessment.

Location	Criteria	Wind Speed (m/s)									
		3	4	5	6	7	8	9	10	11	12
Chessell Pottery	Predicted*	23	23	24	30	31	32	32	-	-	-
	B/G Night	26	27	28	29	31	33	35	37	40	42
	B/G Amenity	31	33	34	36	37	39	40	41	42	43
	Night-Time Limit	43	43	43	43	43	43	43	43	45	47
	Lower Day-Time Limit	36	38	39	41	42	44	45	46	47	48
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
Hartshole Cottage	Predicted*	30	30	31	37	38	39	39	-	-	-
	B/G Night	22	24	25	28	31	34	39	44	50	56
	B/G Amenity	26	28	30	33	35	39	42	46	50	55
	Night-Time Limit	43	43	43	43	43	43	44	49	55	61
	Lower Day-Time Limit	35	35	35	38	40	44	47	51	55	60
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
Churchill Farm	Predicted*	30	30	31	37	38	39	39	-	-	-
	B/G Night	21	23	26	30	36	42	50	59	69	80
	B/G Amenity	25	28	30	33	36	39	43	47	51	56
	Night-Time Limit	43	43	43	43	43	47	55	64	74	85
	Lower Day-Time Limit	35	35	35	38	41	44	48	52	56	61
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-

Location	Criteria	Wind Speed									
		3	4	5	6	7	8	9	10	11	12
Dodpits House	Predicted	22	23	24	30	30	31	31	-	-	-
	B/G Night	25	26	29	32	37	42	49	57	65	75
	B/G Amenity	29	31	33	36	39	42	46	50	54	58
	Night-Time Limit	43	43	43	43	43	47	54	62	70	80
	Lower Day-Time Limit	35	36	38	41	44	47	51	55	59	63
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
Dog Kennel Cottage	Predicted*	27	28	29	35	35	36	37	-	-	-
	B/G Night	31	32	33	35	37	39	42	45	48	52
	B/G Amenity	32	34	35	37	40	42	45	49	52	56
	Night-Time Limit	43	43	43	43	43	44	47	50	53	57
	Lower Day-Time Limit	37	39	40	42	45	47	50	54	57	61
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
Shalcombe Cottage	Predicted*	26	27	28	34	35	36	36	-	-	-
	B/G Night	24	25	26	29	32	37	41	47	54	61
	B/G Amenity	32	34	35	37	39	41	43	44	46	48
	Night-Time Limit	43	43	43	43	43	43	46	52	59	66
	Lower Day-Time Limit	37	39	40	42	44	46	48	49	51	53
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-

Table continued

Location	Criteria	Wind Speed									
		3	4	5	6	7	8	9	10	11	12
8 Tapnell Cottages	Predicted	28	29	30	36	36	37	38	-	-	-
	B/G Night	24	25	27	30	35	40	46	53	62	71
	B/G Amenity	29	31	33	35	38	41	45	49	54	59
	Night-Time Limit	43	43	43	43	43	45	51	58	67	76
	Lower Day-Time Limit	35	36	38	40	43	46	50	54	59	64
	Night-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Lower Day-Time Limit Met?	Y	Y	Y	Y	Y	Y	Y	-	-	-

Table 13.1: noise assessment summary
*Highest over high and low rotational speed operation
Y = yes

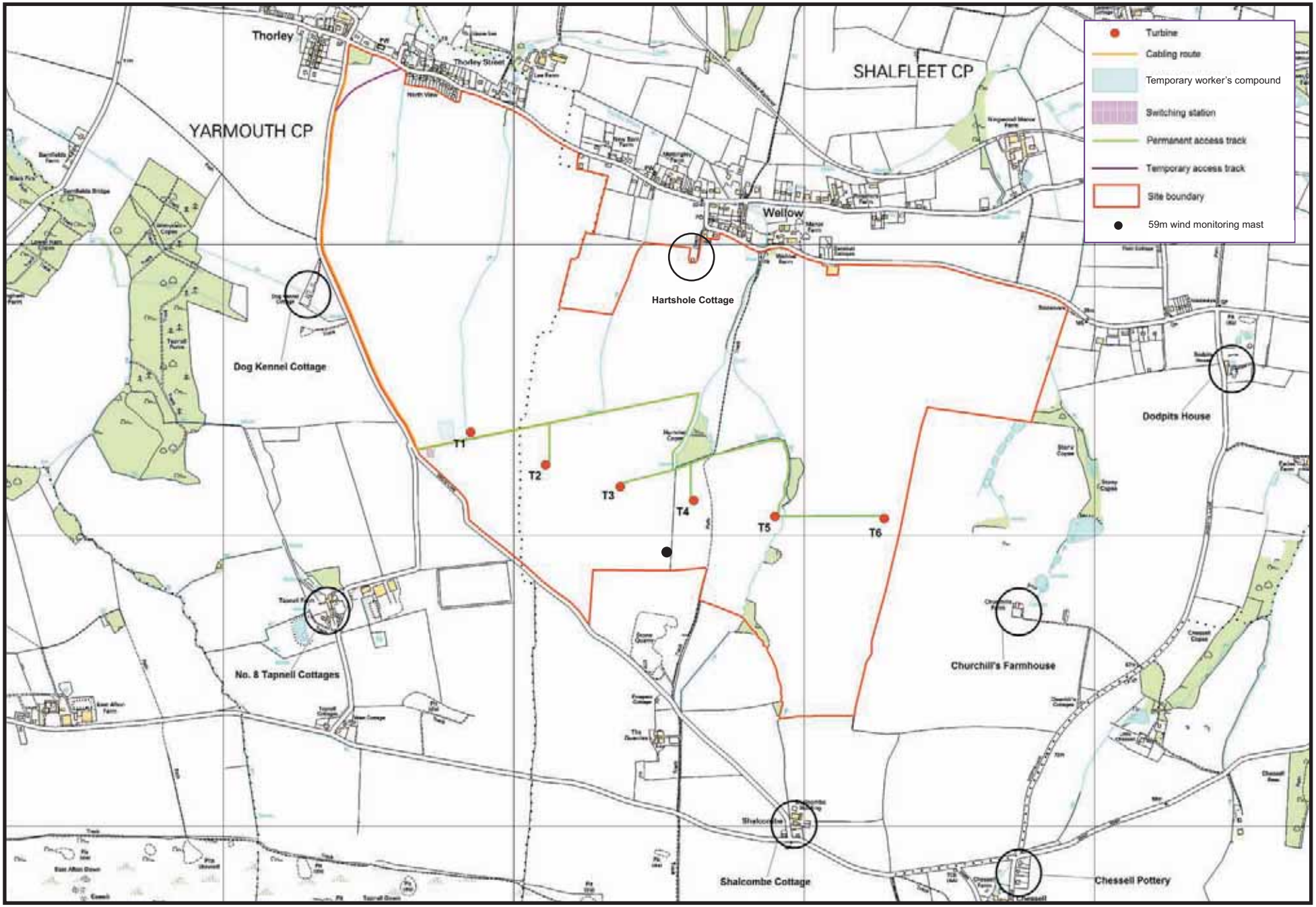


Figure 13.1 : Baseline noise measurement locations

14. Air quality and climate

14.1 While it was agreed that the conclusions of the air quality chapter of the ES reached were acceptable, further clarification was requested on the approach to the dust, nitrogen dioxide (NO_2) and particulate matter (PM_{10}) assessments. Additionally, comments were made relating to the commitment to mitigation measures that appear in the ES chapter. This latter point has been raised with other parts of the assessment and is addressed in chapter 19 of this Addendum.

Dust

14.2 Dust assessments are commonly undertaken on a qualitative basis and this is the case for the West Wight assessment. Here the focus criteria for determining whether an effect is likely and indeed if it is significant, is dependent on the distance between source and sensitive receptor.

14.3 The dust assessment identifies all sensitive receptors within a distance of 100m from construction or excavation works. This distance appears in ODPM guidance and is treated as the distance within which nuisance dust may be likely to occur.

14.4 The assessment also references the Building Research Establishment's (BRE) typical deposition rates for different built environments, as explained in paragraph 11.65 of the ES, which suggest a more quantitative approach.

14.5 If it is considered by the IoWC that the reference to BRE deposition rates in paragraphs 11.65-66, 11.72, 11.91 and 11.105 cause confusion by leading the reader to expect a more quantitative assessment of dust to be undertaken, then the references may be removed from the text. This change will have no effect on the results of the assessment.

PM_{10} and NO_2

14.6 For many developments, PM_{10} and NO_2 are the key pollutants as they are emitted by traffic and are commonly modelled by using the Design Manual for Roads and Bridges (DMRB) screening model. For wind farm developments it is often the case that insufficient traffic movements are generated by the proposals and have no significant change to local air quality.

14.7 Web-tag guidance, formerly guidance on methodology for multi modal studies (GOMMMS) developed by DTI, identifies the threshold of traffic increase to be 10% before any significant effect is likely to occur in local air quality.

14.8 The council questioned the purpose of including detailed reference to the DMRB methodology when ultimately the traffic generated by the proposals is less than the 10% threshold, as set out in table 13.13 of the ES.

14.9 It is acknowledged that the detail of the methodology section (11.47-11.63) may imply that a DMRB assessment will be undertaken. Paragraph 11.50-11.51 should therefore be amended as set out in box 3.

11.50 Three pollutants are examined in this section - NO_2, PM_{10} and dust arisings. The Design Manual for Roads and Bridges (DMRB) is commonly used for assessment of NO_2 and PM_{10} where the effects are likely to be attributed to traffic increases. The DMRB methodology will be used in this assessment in accordance with the guidance set out below.

11.51 Whilst no thresholds on traffic flow or changes in traffic flow exist in the DMRB, Web-tag guidance 2004, which supersedes the Guidance on Methodology for Multi Modal Studies (GOMMMS) 2001, states in unit 1.3.2 that:

Due to the uncertainty of traffic forecasting and the size of traffic flow change needed to affect air quality, options which change traffic flows by less than 10% can usually be scoped out, unless the road is a motorway (due to high traffic flows) or there are particular sensitivities (eg traffic congestion, changes in speed limits or the presence of an AQMA.

11.52 The methodology for dust arisings follows a more qualitative assessment, based on deposition zones around likely dust-producing activities. The assessment is therefore split between these two methodologies.

Box 3

14.10 These changes to the text at the beginning of the methodology section now state clearly that the DMRB is only used for receptors where a predicted increase in traffic is likely to exceed 10%.

14.11 In light of the changes made above, paragraph 11.57 may read as set out in box 4.

11.57 Once the monitoring data and background pollutant concentrations have been reviewed, the DMRB 1.02 model is used as an air quality screening tool, contingent on exceedence of 10% predicted traffic flows. The model is used to highlight if air quality is likely to be significantly affected and hence if more sophisticated predictive tools are required.

Box 4

References

Minerals Policy Statement 2: Controlling and mitigating the environmental effects of minerals extraction in England Annex 1: *Dust*. ODPM, March 2005

Control of dust from construction and demolition. BRE, 2003

Department of Transport 2004, *Transport analysis guidance – Local air quality sub-objective unit 3.3.3* www.web-tag.org.uk accessed April 2006

15 Habitats and wildlife

15.1 Some clarification was requested on aspects of the Habitats and wildlife chapter of the ES. This is provided here and references are set out at the end of the chapter.

Dormice

15.2 Signs of dormice were recorded from one of the copses on site. It was considered that the creation of a permanent access track between turbine 5 and 6 could potentially have an adverse impact on dormice by preventing animals dispersing to other copses on site. Although there is evidence of dormice crossing surprisingly large open spaces, up to 100m through a grass field (Bright, 1998), gaps in linear habitats are generally considered to restrict movements of this primarily arboreal species.

15.3 In light of comments made in relation to the potential impacts on dormice the plans have been revised. The access track will remain in its current proposed location but a short section (3m) of the access track will be removed after the construction phase and planted with coarse grass. This will allow a degree of habitat continuity between the copses. This section of grass will be managed through seasonal autumn mowing.

15.4 In the event that access by heavy maintenance vehicles the section will be 'plated' whereby steel plates will be laid down temporarily to facilitate the crossing.

15.5 It is also proposed that native shrubs and shrubs such as hazel, bramble, dog rose, honeysuckle and oak are planted in any gaps in the extant hedgerows linking the copses to strengthen the links between the woodland areas and aid dispersal of dormice.

15.6 It is considered that with these measures in place, any impacts would be reduced. As evidence of dormice on site suggests very low numbers are present it is not thought that any residual effects will be significant.

Red squirrel

15.7 Surveys have shown that red squirrel are present in the copses on site and are likely to be using the woodland and hedgerows as routes for dispersal. Severance of the broken hedgerow linking copses by the road linking turbines 5 and 6 has been raised as a potential impact of the proposed development. It is not considered that the break in the feature would present a significant barrier to red squirrel, which are capable of crossing open areas and frequently forage on the ground. However, the amendments to the design to include the re-establishment of the vegetation strip post-construction will help maintain a continuous habitat corridor between the copses on site,

allowing red squirrels to move freely across the site. Given that field evidence would indicate only very limited use of the copses on site by red squirrel, it is not considered that the temporary severance of the hedgerow proposed would have a significant impact on the local population in either the short or long-term.

Clarification of terms used in dormouse/red squirrel surveys

15.8 Both red squirrel and dormouse feed on the nuts of various trees and shrubs during the autumn period. Both species have characteristic methods of breaking through the tough outer skin of the nuts to access the kernel inside. Although it is not possible to distinguish between nuts eaten (or gnawed) by grey and red squirrels, only red squirrels are found on the Isle of Wight. It can safely be concluded that nuts showing signs of opened by squirrels on the Isle of Wight have been eaten by red squirrels. The presence of nuts eaten by this species within woodland was used to confirm presence or absence in the surveys undertaken at West Wight.

15.9 Dormice have a distinct method of opening hazel nuts which leaves a smooth round opening, quite distinct from other species of rodent which leave transverse tooth marks across the rim of the nut shell (Bright *et al*, 2006). These distinctly open nuts are the gnawed nuts referred to in the ES. The presence of these nuts within woodland was used to confirm the presence or absence of dormice in the surveys undertaken at West Wight.

Badgers

15.10 Badgers are almost exclusively nocturnal in the UK. There will be no construction traffic operational on the site during the hours these mammals are active. It is not considered that the traffic generated by the construction activities, as described in the ES, pose any risk to badgers through collision with vehicles.

Great crested newts / palmate newts

15.11 Great crested newts are fully protected under the Wildlife and Countryside Act (1981, as amended). Great crested newts are also listed as European protected species under the Habitats Directive of the European Union. The animal is protected from deliberate, or reckless, killing, injury, capture or disturbance. The obstruction of access to areas where great crested newts live and breed, and the damage or destruction of these areas is also prohibited. Palmate newts receive no specific legal protection of this kind.

Water voles/otter

15.12 Several small watercourses are present on site. These were surveyed during the Phase 1 habitat survey and assessed as not being suitable to support either otters or water voles. As the proposed development is situated well away from the majority of watercourses on the site, no impacts on these habitats is predicted. The proposed track crossing between turbine 5 and 6 is the only

part of the development that affects any of the watercourses on site. This stretch of ditch was assessed as being unsuitable for both species during the Phase 1 survey. It would be possible to resurvey this area for the presence of otter and water vole prior to work commencing, but this is regarded as unnecessary due to the unsuitability of the habitat in this area.

Bats

15.13 ECOSA was contracted to undertake a series of bat surveys at West Wight between June and August 2006. These surveys are ongoing and the information provided here is an interim review of the survey findings to-date.

15.14 A standard transect route has been established on the site covering all key habitats likely to be used by feeding bats, including open fields, woodland edge and hedgerows. Two transects a month have been surveyed with each survey lasting four hours and involving two people. Each registration of bat activity is mapped and a flight height recorded. The three flight bands used are 0-20m, 20-50m, 50-100m and over 100m. The flight bands were selected in order to cover from ground to maximum blade tip height. Pettersson time expansion bat detectors are being used and sound records made. This allows sonograms to be used to confirm identification of the bats using the site. Remote recording using an Anabat CD1 has also been carried out at each individual turbine location.

15.15 The survey has found a large maternity roost of common pipistrelle in buildings in the vicinity of Manor Farm. During the survey period, these bats were leaving the roost site and flying south towards feeding areas. The main route takes the bats through the site along the course of the bridleway that runs between Manor Farm and Prospect Quarry. Common pipistrelle have also been recorded foraging in the vicinity of Hummet Copse.

15.16 A small watercourse splits just north of Hummet Copse. A ditch connects Hummet Copse to the stream with the other branch of the stream taking a more south easterly direction across the site. Three small copses are located along the course of the more south easterly fork and bats have been recorded using this route to cross the site.

15.17 The use of these routes and the number of bats using them for commuting is likely to vary depending on factors such as temperature, wind speed and prey availability, as well as seasonally. Nevertheless, both commuting routes should be considered as significant for bats breeding at Manor Farm. More work on flight height is underway to try to determine risk, but pipistrelles are generally thought to commute at fairly low levels, and most are likely to be passing through the line of turbines below rotor height, reducing any risk of collision.

15.18 Much of the remaining area of the site to the east and west is little used with only the occasional record of foraging common pipistrelle mostly restricted to the small watercourses to the west.

15.19 Species recorded on site to date are shown in table 15.1.

Bat species	Peak registrations
Common pipistrelle	46
Soprano pipistrelle	5
Serotine	4
Noctule	2
Natterers	1

Table 15.1: number of peak registrations of bats to-date.
These are the number of registrations that can be attributed to specific bat species. These data represent the relative abundance of bats within the survey area rather than the absolute number of individuals recorded.

15.20 Both noctules and serotines are large, high-flying bat species, and both are considered to be potentially at risk from collisions with turbines. It is considered that serotine bats may roost at Manor Farm, as they are frequently present in the vicinity of the farm in the early evening before commuting high to the south west across the site. A peak number of two noctule bats has been recorded in the vicinity of Hummet Copse. A single noctule was also suspected of emerging from a hole in the poplar in the south east corner of Hummet Copse, but this has not been confirmed.

15.21 Evidence of the risk to bats from wind turbines is limited and studies have shown contrary results. There is strong evidence from America that migratory bats are at risk from collision with turbines, particularly during autumn (Betts 2006).

15.22 The risks posed to European bat species from wind farms is poorly understood, although bat fatalities have been recorded at a number of wind farms in Europe. For example, a study from Navarre in Spain found that a number of aerial hawking species were killed in collisions with turbines, particularly in the period August to early-October when mating and dispersal was taking place (Alcalde & Saenz 2004). Both noctules and serotines hunt primarily through aerial hawking.

15.23 In Germany, significant numbers of resident bats, including pipistrelles, have been killed at wind farms. Research has found that locating wind farms in highly-structured landscapes such as forest significantly increases the incidences of bat mortality. In Britain, linear features such as hedgerows and watercourse have been shown to be important commuting and feeding routes for many bat species.

15.24 The risk to bats from turbines is an extremely complex issue and a number of variables have to be considered when assessing the potential risk to populations. Risk is likely to vary depending on a number of factors including time of year, whether populations are breeding near wind farms or on migration, the feeding strategy adopted by each species, type of landscape and seasonal availability of prey. The studies undertaken to date have illustrated there is a risk to bat populations from wind turbines, although caution should be exercised in applying the findings universally to all wind

farms. Given the wide range of factors that appear to influence the potential risk of collision with turbines, local conditions and habitats are likely to be the most significant factors affecting potential risk.

References

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16. Traffic and transport

16.1 Questions were raised regarding the ability of the abnormal loads (transporting long blades and large generator components) and general construction vehicles to pass the routes as set out in the ES.

16.2 In addition to the transport route, detail was requested on the construction management plan (CMP). The CMP will be produced and agreed with the IoWC before construction commences. The basic information is provided in this chapter. Amendments have also been included where minor errors were identified in the original text.

Construction vehicle routing

16.3 Figure 16.1 shows the preferred route plans for conventional construction vehicles and abnormal load (over-sized) vehicles placed on an Ordnance Survey base map. This has been included to provide context to the schematic figures in the ES. After discussions with the IoWC highway officers, agreement was reached on the suitability of the preferred routes shown in table 16.1 for vehicles of maximum size; length 47m, width 4.20m, and height 3.40m.

Abnormal load - preferred Medina Wharf - Artic Road - A3020 - A3054 (bypassing Forest Road roundabout) - Station Road - Main Road (Wellow) – site; and visa-versa
Abnormal load - alternative Medina Wharf - Artic Road - A3020 - A3054 (bypassing Forest Road roundabout) - Elm Lane - B3401- B3399 - site; and visa-versa
HGVs to site via A3054 (via either Medina Wharf – see above, or Vestas Blades) – B3401 Thorley Road – Broad Lane
From site via B3399 – B3401 – Elm Lane – A3054
Table 16.1: routes reviewed

16.4 In table 13.5 of the submitted ES, information is provided on predicted modifications to the road network considered necessary to provide passage to the abnormal loads. In order to address the IoWC's concern that the routes are indeed passable and all modifications to the network are temporary and able to be fully reinstated, the following table has been included. This has resulted from further discussions with the IoWC highways staff and examination of the preliminary swept path analysis for key points on the routes.

Location	Surveyed	Remedial measures	Temporary or permanent
Junction of Medina Wharf/Artic Road	No	A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However, in agreement with IOWC officers, this exercise is not considered necessary prior to determination because expected changes are very minor in nature and expected: temporary and minor overrun of highway grass verge and temporary removal and replacement of the mini roundabout signs and posts. Verges will be reinstated to previous condition, or better, on completion.	Temporary
Junction of Artic Road/A3020	No	A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However the only remedial measures expected are footway repairs if overrun is required. Such repairs will be undertaken the same day.	Temporary
A3020 route on to A3054 (bypassing Forest Road roundabout)	No	A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However, in agreement with IOWC officers, this exercise is not considered necessary prior to determination because expected changes are very minor in nature and expected: temporary and minor stoning/tarmacing of highway grass verges to be overrun with associated temporary reinstatement if required and tarmac ramping of limited sections of the central reserve to facilitate overrun. Permanent reinstatement of grass verges to previous condition, or better, will be required at completion, ramping will be immediately removed. Some street furniture may also be required to be temporarily removed i.e. illuminated bollard. This, however, will be removed and reinstated on the same day.	Temporary
A3054 outside Kitbridge School	No	A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However, in agreement with IOWC officers, this exercise is not considered necessary prior to determination because expected changes are very minor in nature and expected: temporary removal and then immediate reinstatement of the yellow bollards.	Temporary
A3054 at Vittlefields Farm	No	A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However, in agreement with IOWC officers, this exercise is not considered necessary prior to determination because expected changes are very minor in nature and expected: temporary and minor stoning/tarmacing of highway grass verges to be overrun with associated temporary reinstatement if required. Permanent reinstatement of grass verges to previous condition, or better, will be required at completion.	Temporary

Location	Surveyed	Remedial measures	Temporary or permanent
A3054 at Winchester Corner	No	A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However, in agreement with IoWC officers, this exercise is not considered necessary prior to determination because expected changes are very minor in nature and expected to include – temporary and minor stoning/tarmacing of highway grass verges to be overrun with associated temporary reinstatement if required. Permanent reinstatement of grass verges to previous condition, or better, will be required at completion.	Temporary
A3054 junction with Station Road	Yes (swept path analysis attached)	A preliminary swept path analysis has been undertaken and it shows that the passage of the turbine components around the left bend from A3054 into Station Road can be successfully navigated without encroaching on third-party land. The manoeuvre, as shown in figure 16.2, will involve reversing around the bend and continuing south along Station Road until a forward left turn into Wellow Road can be made. A reversing manoeuvre such as this is common in order to maximise the turning space available for such large vehicles. Indeed the oversize vehicle is equipped with steering controls at both ends of the vehicle to assist manoeuvrability.	Temporary
Station Road to Wellow Road	No	The forward left turn into Wellow Road (which leads to Wellow Main Road) will overrun a wide grassy verge. A full survey will be undertaken as part of the CMP, which will include an appropriate swept path analysis. However, in agreement with IoWC officers, this exercise is not considered necessary prior to determination because expected changes are very minor in nature and expected to include – temporary and minor stoning/tarmacing of highway grass verges to be overrun with associated temporary reinstatement if required. Permanent reinstatement of grass verges to previous condition, or better, will be required at completion	Temporary
Main Road, Wellow at identified road narrowings	Yes (swept path analysis attached)	The swept path analysis has been undertaken and confirms that the passage of the abnormal length loads is possible. As shown in figure 16.3, this passage through Wellow is likely to require trimming of the highway verges to facilitate the easier passage of such component parts. All works will be undertaken with due care to hedgerows and where necessary, temporary embankment supports will be implemented as required. On completion all hedge embankments will be reinstated.	Temporary

Table 16.2: results from abnormal load route analysis * The transportation of all loads will be accompanied by a full photographic record of those areas requiring temporary works to ensure that final reinstatement is equal to or better than the initial situation.

16.5 The following mitigation measures are proposed in order to address and monitor the movement of vehicles associated with the development of the West Wight wind farm and to meet the requests of the police and highway authorities:

- working hours restricted to 7.30am – 6.30pm Monday to Friday avoiding the times associated with school peaks and 8am – 1pm on Saturday; no works on Sundays or Bank Holidays
- routing strategy derived above to be included within the CMP
- movement of abnormal loads or vehicles to be conducted in accordance with the Highway Agency voluntary guidance, and to be further advertised through local newspapers and radio stations
- set-up and running of community action plan to advise and respond to third party questions and concerns as they relate to highway issues
- set-up and regular convening of stakeholders group meetings/forums to ensure affected residents, schools and businesses etc. are actively involved in reducing and controlling vehicular movement impacts
- for those sites not already surveyed, advance track plot analysis will be undertaken as part of the CMP in order to ascertain extent of accommodation works required at key junctions and pinch points on the local highway network as identified within the above route audit
- continued monitoring and reinstatement of verges overrun by abnormal vehicles.

16.6 It is vital that the detail on the CMP is agreed with the IoWC prior to commencement of the works. The plan will provide comprehensive route plans for all HGVs and abnormal loads. Such plans will be accompanied by swept path analysis based on topographical survey data at the following locations:

- Junction of Medina Wharf/Artic Road
- Junction of Artic Road/A3020
- A3020 route on to A3054 (bypassing Forest Road roundabout)
- A3054 outside Kitbridge School
- A3054 at Vittlefields Farm
- A3054 at Winchester Corner
- A3054 junction with Station Road
- Station Road into Wellow Road
- A3054 junction with Elm Lane
- B3401 junction with Elm Lane
- Main Road, Wellow at identified road narrowings
- B3401at Calbourne Watermill.

16.7 The CMP will also confirm the following points.

a) The vertical alignment of the A3054 between Kitbridge School and the Gunville Road traffic signals will not cause a problem.
b) Details of street furniture that may be required to be temporarily relocated or alterations to the highway layout that may be required to

facilitate the passage of abnormal loads along the approved route, including the methodology for undertaking such proposals.

c) An independent safety assessment of the approved HGV and abnormal load routes and proposed highway alterations, including response to issues.
d) Confirmation that abnormal loads will be accompanied by an escort and confirmation that every effort will be made to ensure that HGV and abnormal load movements are programmed to avoid highway peak hours and school pick-up/drop-off times.
e) Proposal for ongoing traffic monitoring to ensure that traffic sensitive peaks are being avoided, that daily HGV movements are not excessive and that abnormal load movements are being suitably controlled (potentially measured through the recording of HGV movements at origin and destination points).
f) Proposed methodology for advertising/liaising on timing of abnormal load movements.

Traffic delay

16.8 Traffic delay was raised as an issue that had not been adequately addressed in the original ES text. The IoWC highways staff, however, were satisfied that this could be addressed subsequently once they had viewed the provisional information to be included in the CMP as presented above.

Direct amendments to the ES text

16.9 For the purposes of accuracy the following text changes in the ES are confirmed. They relate to factual errors on road names.

13.71 … and the B3401 from its junction with Broad Lane…

This should read:
13.71 … and the B3399 from its junction with Broad Lane…

And:
13.75 From Calbourne, the A3401…

This should read:
13.75 From Calbourne, the B3401…

And:
Table 13.4 – Section 8 should include after Calbourne Road the words ‘through Newport’ and then continue… to the Forest Road Roundabout.

Box 5

16.10 For reference, the Highways Agency was consulted as some land-based routing may start on the mainland where they have jurisdiction.

16.11 Additional clarification has been provided for paragraph 13.67.

Main Road [in Wellow] is locally narrowed to 5 metres, which should required abnormal loads to straddle the carriageways, but would enable normal HGVs to pass by one another unimpeded.

This should read:

Main Road [in Wellow] is locally narrowed to 5 and very occasionally 4 metres, which should require abnormal loads to straddle the carriageways, but would enable normal HGVs to pass by one another unimpeded.

Box 6

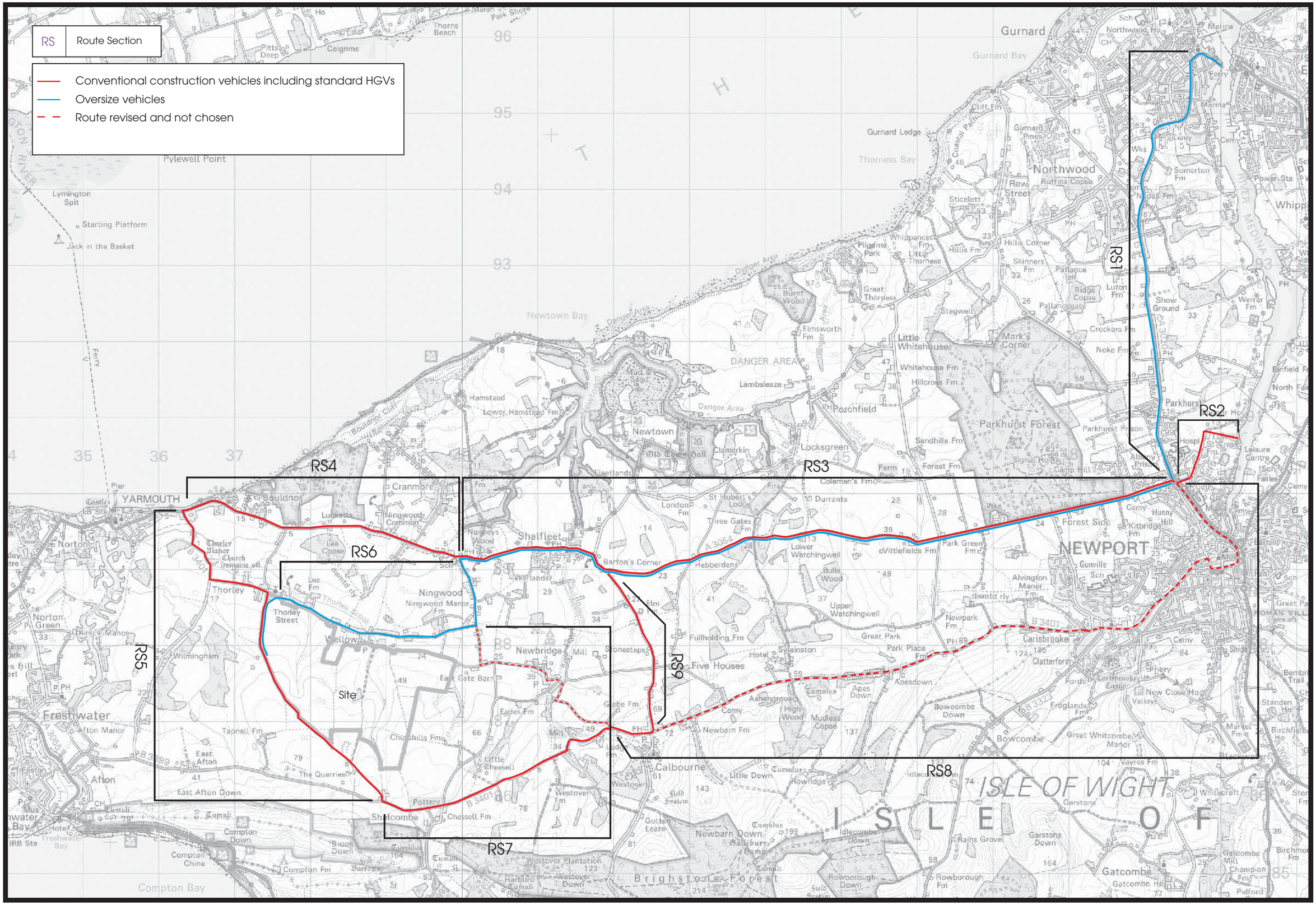
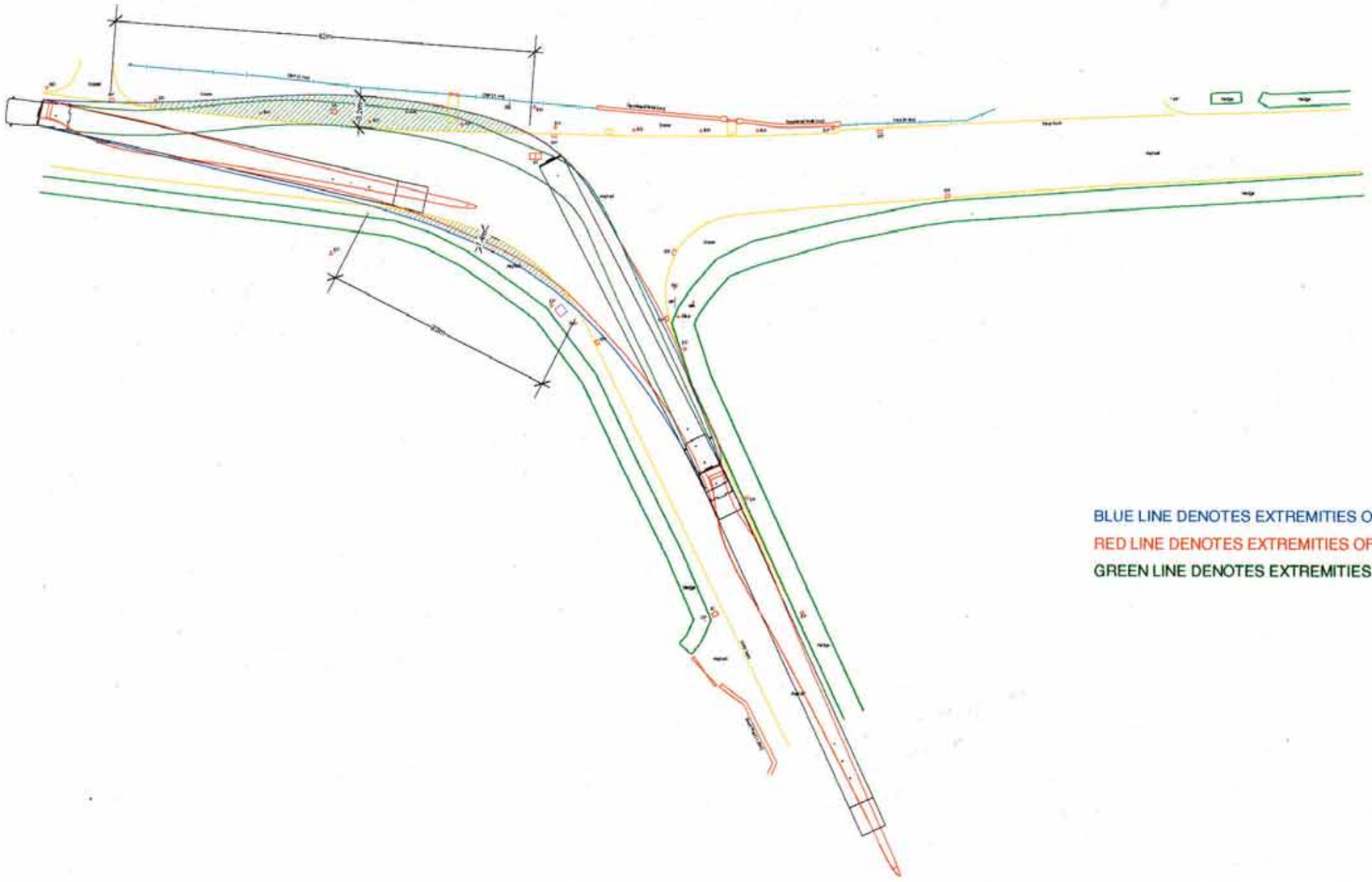


Figure 16.1 : Proposed vehicle routing in local road network



BLUE LINE DENOTES EXTREMITIES OF TRIALER WHEN TURNING

RED LINE DENOTES EXTREMITIES OF BLADE WHEN TURNING ON TRIALER

GREEN LINE DENOTES EXTREMITIES OF TRACTOR WHEN TURNING

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RevNo	Revision note		Date
1	widened turn over verge outside school		23.08.06
Designed by N.B.		Checked by M.F	
File name 129	Date 23.08.06		Scale 1:500
40m Blade Reversed down Station Road - Ningwood - Isle of Wight			
MDF129B		Edition 1	Sheet 1

Figure 16.2 : Swept path analysis for abnormal size vehicle turn, A3054 into Station road

BLUE LINE DENOTES EXTREMITIES OF TRIALER WHEN TURNING
RED LINE DENOTES EXTREMITIES OF BLADE WHEN TURNING ON TRIALER
GREEN LINE DENOTES EXTREMITIES OF TRACTOR WHEN TURNING

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RevNo	Revision note		Date
Designed by N.B.		Checked by M.F	
File name 122	Date 16.08.06		Scale 1:500
40m Blade - Wellow Road, Isle of Wight			
MDF122B		Edition 1	Sheet 1

Figure 16.3 : Swept path analysis for abnormal size vehicle along along Wellow Main Road

17. Water environment

17.1 Two elements of the water environment chapter have been identified by the IoWC as requiring clarification. These relate to the provision of toilet facilities on site and the effect of run-off from new roads and associated hardstanding.

17.2 The proposed development will only provide self-contained 'Portaloo' facilities on a temporary basis during the construction phase. No toilet facilities will be provided during the operational phase.

17.3 The proposed permanent hardstanding covers an area of 2.05ha. This accounts for 0.73% of the total site area and the majority of this will comprise the permanent access tracks and crane pads. No detail was provided in the ES on why volumes of surface runoff and the effect this has on surface and ground water because it was not considered a significant environmental effect. No flood risk assessment was requested by the Environment Agency (EA) during the consultation phase. The justification for excluding this from the assessment is set out below.

17.4 Rainfall run-off from the site access tracks has the potential to increase peak flows in the local watercourses during storms. This is most likely to occur if the access track surface is allowed to channel run-off to discrete points close to a stream, rather than shedding water evenly to the surrounding land.

17.5 The site tracks and crane pads will be constructed from crushed stone over a geogrid. This surface will be semi-permeable, allowing some rainfall to return to the underlying ground. The proposals state that the maximum width of the access track will be reduced from 5m during the construction phase to 3m during the operational phase. They also state that the tracks' sloped verges will be re-seeded. Both of these measures reduce the extent of any run-off.

17.6 In keeping with the track surfaces, the similarly designed crane pad verges will also be re-seeded. Notes on the technical drawings were included in the planning application to reflect this.

17.7 The access tracks will be cambered and so a maximum of 2.5 m (construction phase) or 1.5 m (operational phase) width is discharged to each side of the road, i.e. from the centre to the each edge. This water will infiltrate the ground close to the side of the road as it does now, and there will be no noticeable difference to the current natural drainage regime.

17.8 The greatest risk of increased flows reaching a watercourse is where a section of road slopes towards a stream and run-off from a large field area could be intersected and then channelled to the stream, causing it to accept more water than it does in the baseline condition. In these areas, the access track will be

constructed with small humps at intervals to ensure that run-off is shed evenly along the length of the road and not just at the bottom of a hill.

17.9 The nearest properties are over 500m downstream of the road and any existing flooding will not be exacerbated. There will be no increased risk of flooding if these simple design precautions are incorporated.

17.10 During the course of the consultation period the Environment Agency returned a letter of objection requesting background information on potential contaminated land issues. A contaminated land report was subsequently submitted and the Environment Agency removed its objection. The report, produced by Hydrock Consultants Ltd., identified no sources of contamination on the site thereby concluding that there is no risk of contamination to soil, ground water or surface water. The report is available upon request from Terence O'Rourke Ltd., for a small fee to cover printing costs.

17.11 In removing its objection, the Environment Agency requested three conditions be taken into consideration by the IoWC. These are stated below.

a) The provision of a surface water regulation system is designed and implemented to the satisfaction of the planning authority and supported by detailed calculations. The runoff generated by the 1% probability storm must not exceed the runoff from the undeveloped site. The scheme will include a maintenance programme and establish ownership of the drainage system.
b) No development approved by this permission should commence until a management plan is drawn up and agreed by the Local Authority to secure and enhance the site’s contribution to nature conservation and biodiversity. The residual impacts resulting from this development should be mitigated through appropriate positive management of the remaining habitat.
c) Planting schemes should, where possible and certainly close to the watercourses, include native trees and shrubs appropriate to the area, ideally using seed or stock of local provenance.

18. Shadow flicker, aviation and communication

18.1 Bournemouth International Airport has raised an objection on the proposed wind farm in relation to radar and aviation-communication issues. Discussions are ongoing in order to reach a solution. The IoWC will be informed of the progress prior to the determination date.

Television reception

18.2 Interference with television signals is commonly experienced by residences in close proximity to wind turbines. It is also common that mitigation measures are provided by the developer to minimise or eliminate any loss of signal. Paragraph 15.35 of the ES identifies a set of measures that YEL is prepared to undertake to mitigate any loss of signal. These are found in chapter 19 of this Addendum.

Modification to the ES

18.3 Figure 15.2 of the ES has been modified to include the position of the meteorological mast, as requested by the IoWC. This appears as figure 18.1 of this Addendum.

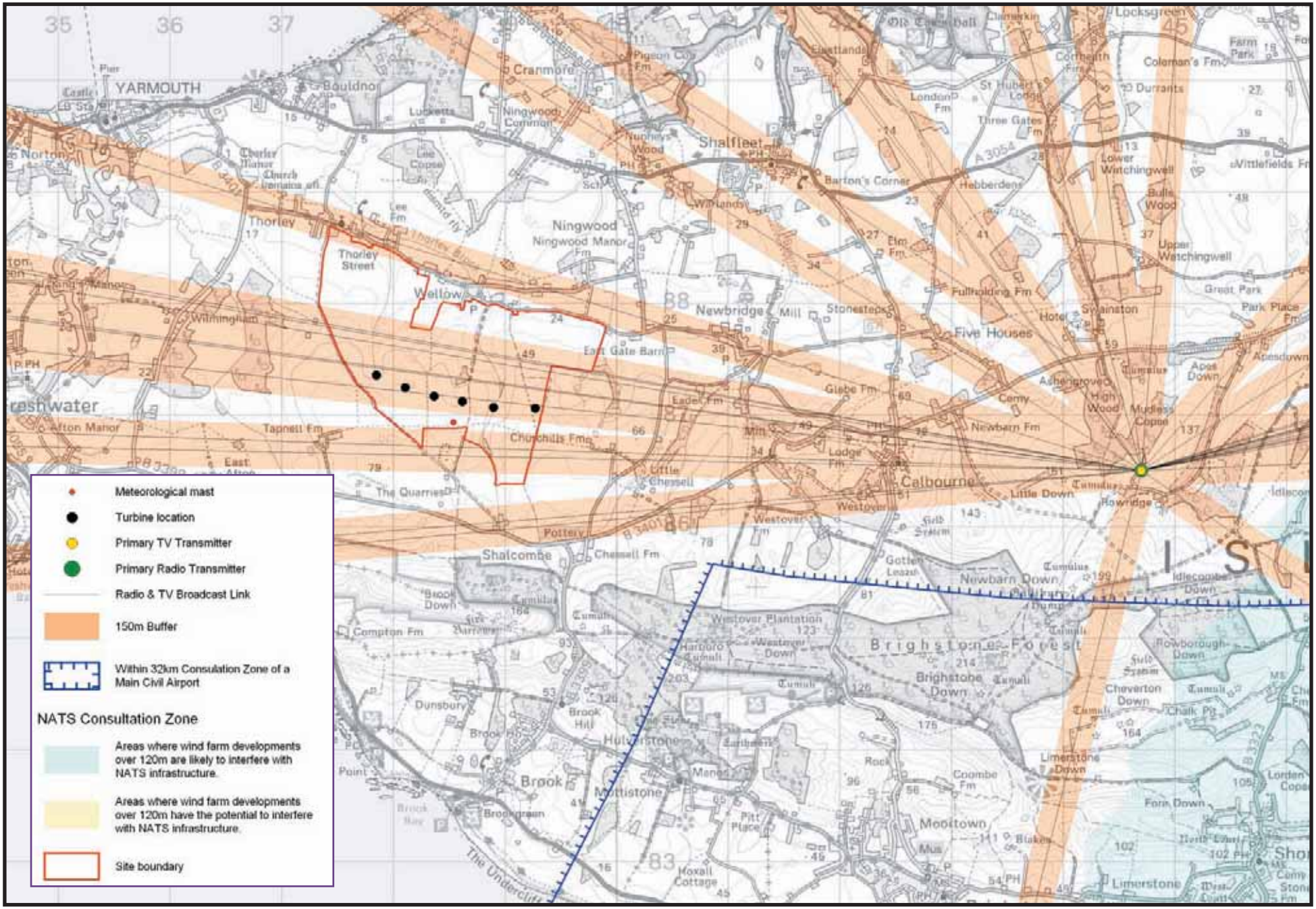

Figure 18.1 : Communication corridors across the proposed site

19. Miscellaneous points of clarification

19.1 The IoWC requested that mitigation measures as presented throughout the ES should be consolidated in one comprehensive table. As part of the update it was also requested that the mitigation measures were presented with more commitment where possible, providing information on responsibility, time scale and who is anticipated to cover the cost. This information has been included in the table below. Note, therefore, that the provision of this information means that this table supersedes mitigation measures presented in the ES document.

19.2 This table has been provided to assist the IoWC in determining which mitigation measures can be subject to a condition or section 106 agreement.

Mitigation measure	Responsibility	Time scale	Cost to be covered by
BIRDS			
Construction phase: during the implementation of very short crossings of some hedgerow and grassy habitat types, work will occur outside nesting season to ensure vegetation that potentially could be supporting nesting birds will be avoided.	Construction management plan / sub contractor / YEL	March – July (avoiding)	n/a
Operation: The very small or negligible risk to merlin, hen harrier and barn owl of collision with moving turbine blades can be further reduced by ensuring areas likely to attract significant concentrations of passerines and small mammals, such as conservation headlands, set-aside and game cover strips, are situated well away from the turbines.	Farm cultivation plan	Duration of proposal	n/a
An ornithological monitoring programme will help to identify any residual effects. This might allow other mitigation to be introduced if necessary, and it will inform impact predictions for other similar projects elsewhere. The details of this would be agreed with the IoWC and English Nature.	YEL/EN/IoWC	Post-construction	YEL
CULTURAL HERITAGE			
A programme of archaeological works in tandem with the initial site preparation and construction phase is proposed to offset adverse effects by recording any archaeological features that may be disturbed by the construction of the other elements of the wind farm; the temporary compound, grid connection, permanent access track and switching station.	YEL	Construction phase	YEL
A Written Scheme of Investigation (WSI) for archaeological mitigation works will be prepared in close consultation with the County Archaeology Service. A site archaeologist will be required to monitor all phases of the construction process, and be responsible for ensuring that these works do not destroy any previously unknown and unidentified archaeological finds or features on the site. The project archaeologist may be obliged to produce written guidelines for use by all construction contractors, outlining the need to avoid causing unnecessary damage to archaeological sites or features.	YEL / county archaeologist	Construction phase	YEL

Mitigation measure	Responsibility	Time scale	Cost to be covered by
LANDSCAPE AND VISUAL EFFECTS			
Mitigation has been an integral part of the scheme design. The layout and positioning of the turbines and secondary structures such as the switching station have sought to minimise potential landscape and visual impacts. This 'primary' mitigation is inherent in the scheme design and has therefore been considered as part of the assessment.	n/a	n/a	n/a
The planting of native tree and shrub species to form a small copse is proposed on the southern edge of the switching station. This is to reduce its visual prominence in the landscape, which is very open and exposed in this location.		Long term	YEL
LAND USE, COMMUNITY AND SOCIAL EFFECTS			
In order to minimise the potential for damage to soil structure and the loss of soil resources during construction, soils will be excavated in line with Defra soil handling guidelines (MAFF, 2000). These include the following recommendations: • The use of backacters and dump trucks for soil excavation and movement • Soil excavation to be carried out during dry weather where possible • Re-use of soil around turbine footings where possible • Topsoil and subsoil to be excavated and stored separately • little (if any) soil resources to be transport off-site.	To be included in the CMP	Construction phase	n/a
NOISE AND VIBRATION			
No mitigation measures identified	n/a	n/a	n/a
AIR QUALITY AND CLIMATE: **Construction: dust**			
Completed earthworks will be covered or vegetated as soon as is practicable	Sub contractor / YEL	Construction phase	n/a
Vehicles carrying loose aggregate and workings will be sheeted at all times	Sub contractor / YEL / CMP	Construction phase	n/a
Slopes of stockpiles and mounds are at an angle not greater than the natural angle of repose of the material, the stockpiles / mounds must not have sharp changes in shape.	Inclusion into CMP / subcontractor / YEL	Construction phase	
Short-term storage mounds and stockpiles may be enclosed or kept under sheeting. Prevention of windborne dust from these mounds may also be achieved through suitable and sufficient water sprays, wind barriers, protective fences of similar size and height to the mound.	Inclusion into CMP / subcontractor / YEL	Construction phase	
Design controls for construction equipment and appropriately designed vehicles for materials handling will be used.	Sub contractor / YEL	Construction phase	

Mitigation measure	Responsibility	Time scale	Cost to be covered by
Suitable wetting of soil surfaces will be carried out during the earth moving activities on the proposed development site to minimise soil loss through airborne dust, this may be done through the use of a water bowser, or static sprinklers, depending on the scale necessary. Early surfacing of internal roads will also aid in minimising dust re-suspension on site. Given the absence of receptors from the turbine locations themselves, this mitigation will be primarily directed at the cable trenching route adjacent to Broad Lane.	Inclusion into CMP / subcontractor / YEL		
Regular inspection and, if necessary, cleaning of local highways and site boundaries, to check for dust deposits will be carried out (and dust removed if necessary). Focus for this will primarily be by High Road in Wellow and the Length of Broad Lane	Inclusion into CMP / subcontractor / YEL		
Wheel-washing devices will be used at the proposed development site exits during the early stages when the access tracks have not been built to minimise transfer of dust and particulate material onto surrounding highways.	Inclusion into CMP / subcontractor / YEL	Construction phase before access tracks are established	YEL
All construction plant and equipment will be maintained in good working order and not left running when not in use.	Sub contractor	Construction phase	n/a
No unauthorised burning of any material will be carried out anywhere on the proposed development site	Sub contractor / YEL	Construction phase	n/a
Construction vehicle access arrangements will be designed to avoid sensitive streets or narrow, congested roads.	Sub-contractor / YEL to be included in CMP	Construction phase	n/a
Material deliveries and vehicle access to the proposed development sites will be timed to avoid the need to queue outside the site prior to opening or whilst other deliveries are completed.	Sub-contractor / YEL	Duration of proposal	n/a
Timing and phasing of construction activities plus contact details of relevant offices will be published, to facilitate the raising of concerns should they arise.	YEl/IoWC/sub-contractor	Construction phase	n/a
HABITATS AND WILDLIFE			
Construction: The design and construction of the watercourse crossing will take due account of the need to maintain water quality and to prevent any indirect effect on habitats and wildlife downstream	YEL/EA/EN	Construction phase	n/a
Operation: Bats The turbines are located on arable land, largely away from the features used for foraging and movement. The careful siting of access routes has also maintained the connectivity of the existing hedgerows and other linear features to ensure that established foraging routes within the site and the wider area are retained.	YEL/EN/IoWC	Duration of proposal	YEL

Mitigation measure	Responsibility	Time scale	Cost to be covered by
Planting will be undertaken with native shrubs and shrubs such as hazel, bramble, dog rose, honeysuckle and oak are planted in any gaps in the extant hedgerows linking the copses to strengthen the links between the woodland areas and aid dispersal of dormice.	YEL/IoWC/EN	Duration of proposal	YEL
A short 3m section of the access track will be removed after the construction period and planted with coarse grass, in order to maintain some habitat continuity between the copses. This section of grass will be managed through seasonal autumn mowing.	YEL	Duration of proposal	YEL
TRAFFIC AND TRANSPORT			
Mitigation measures are proposed in order to address and monitor the movement of these vehicles and to meet the requests of the police and highway authorities. The construction environmental management plan (CMP) will be produced prior to construction commencing. It will should also be subject to condition and agreement with the IoWC. The following mitigation measures are proposed and will be included in the CMP: • working hours will be restricted to 7.30am – 6.30pm Monday to Friday, avoiding the times associated with school peaks and 8am – 1pm on Saturday; no works on Sundays or Bank Holidays • routing strategy to be included in the construction environmental management plan • movement of abnormal loads or vehicles to be conducted in accordance with the Highway Agency voluntary guidance, and to be further advertised through local newspapers and radio stations • community action plan to advise and respond to third party questions and concerns as they relate to highway issues • stakeholders group meetings/forums to ensure affected residents, schools and businesses are actively involved in monitoring any vehicular movement impacts • advance track plot analysis as part of the environmental management plan in order to ascertain the extent of accommodation works required at key junctions and pinch points on the local highway network, as identified within the above route audit • continued monitoring and reinstatement of verges over-run by abnormal vehicles.	YEL, elements to be included in the CMP	Construction phase	YEL
Operational period (phase II): no mitigation is required during the normal operational period. Due consideration will be given to any necessary mitigation required for any unplanned, major maintenance works.	YEL	Post construction phase	YEL
Decommissioning period (phase III): The effects on the local highway network will be considered at the time of decommissioning through an update of this transport assessment.	YEL	Decommiss-ioning phase	YEL

Mitigation measure	Responsibility	Time scale	Cost to be covered by
WATER ENVIRONMENT			
Construction phase Access tracks Access tracks avoid all watercourses with the exception of a single watercourse crossing between turbines 5 and 6. The track layout minimises the area of land take, and thus will minimise the amount of soil that will be stripped and stockpiled.	YEL	Construction phase	n/a
Stockpiled soils will be stored upgradient to ensure that runoff does not flow onto track surfaces. There is a minimum stand off of 20 metres from the stockpile areas to any watercourse to minimise the potential for contamination.			
Where access tracks are built above the ground surface, they will be finished with a camber to ensure that drainage is quickly shed to avoid erosion of track surfaces and turbid water generation.	YEL	Construction phase	n/a
Buffer strips adjacent to the tracks will be provided to ensure that any runoff is adequately filtered through vegetation. Where access tracks are below ground surface, drainage will be collected in track-side ditches and will be directed to discharge points along track routes. These discharge points will enter small buffer zones, again designed to filter out sediments. There will be no need for a direct discharge into any watercourse from access track drainage as the runoff rates will be relatively small and the buffer zones will ensure that runoff filters into surrounding fields. These buffer zones will also reduce runoff rates and therefore no increase in runoff or downstream flooding risks are predicted. A sediment management plan for the site, incorporating these measures and others described in Environment Agency PPG notes, CIRIA guidance and Forest and Water Guidelines will be provided for the construction phase.	YEL	Construction phase	n/a
Water course crossing: A single watercourse crossing will be required, and this will be designed in accordance with Environment Agency and CIRIA (CIRIA 2001) best practice guidance. The type of crossing method chosen will be based on the sensitivity of the stream banks and bed at this location. It will be designed to minimise the impacts on the stream bed. The crossing is also likely to require Land Drainage Act consent from the Environment Agency, and this process will also act to place controls on the design of the crossing.	YEL	Construction phase	n/a
The watercourse crossing will be oversized to ensure that it can convey all likely flows experienced within the channel. This will ensure that there is no risk of flooding or increased velocities resulting in potential erosion problems.	YEL	Construction phase	n/a

Mitigation measure	Responsibility	Time scale	Cost to be covered by
Turbines and crane pads: Turbines have been located as far from all watercourses as feasible, the closest being turbine 1 which is approximately 15 metres from the head of a small drainage channel. Turbine foundation excavation depths will be between 2 metres and 3 metres. When excavating the turbine foundations, a soil water table may be encountered. Any water will be pumped out and passed to a temporary sump to allow suspended sediment to settle out. Treated water will then either be passed to a nearby watercourse with the prior agreement of the Environment Agency or passed through a buffer area of vegetation (the latter being the preferred option).	YEL	Operational phase	n/a
Operational phase: methods incorporated into the scheme are designed to be sustainable and drainage will be designed to cope with wet weather conditions. Therefore, only routine maintenance is envisaged for the track network during the operation of the site. The drainage provision incorporated into the design of the access tracks will ensure that there is no increase in surface water runoff entering any of the nearby watercourses.	YEL	Operational phase	n/a
Watercourse crossing The potential for sediment input from the crossing will be controlled by the placement of protective barriers, 0.25 metres in height, along the sides of the crossing. This will restrict the direct entry of runoff from the tracks into the watercourse and restrict the potential for turbid water input. Any runoff will be directed away from the crossing and will be allowed to flow into vegetated buffer areas.	Sub contractor / YEL	Construction phase	YEL
Switching station The switching station will be designed in accordance with best practice, which will ensure that there is no potential for leaks or pollution incidences from the site. The switching station will also be subject to routine checks and maintenance.	YEL	Duration of proposal	YEL
Should groundwater be present, the method of construction will be such that impacts will be minimised. Sheet piling would be used to minimise the impact on groundwater level and reduce the need for extensive dewatering of the excavations.	Sub contractor / YEL	Construction phase	n/a
Soils will be excavated in accordance with Defra guidelines for handling soils (MAFF 2001) to ensure that damage to soil structure is minimised. Such measures will include: • use of backacters and dump trucks for soil excavations and movements • soil excavations to be carried out during dry weather, where possible • re-use of soils around turbine footings where possible • topsoil and subsoil to be excavated and stored separately • minimal (if any) soil resources to be transported off-site excavated soil resources to be seeded and re-vegetated as quickly as possible, if not re-used, to avoid erosion potential.	Sub contractor / YEL	Construction phase	n/a

Mitigation measure	Responsibility	Time scale	Cost to be covered by
Electric cables: trenches will run alongside or under access tracks. Topsoil and subsoil will be excavated separately to ensure that the soil profile can be restored once the cables are in place. Soils will be replaced as quickly as possible to avoid these small trenches becoming drainage pathways.	Sub contractor as agreed in the CMP / YEL	Construction phase	YEL
Construction compound and switching station: Erosion control measures will be put in place when developing the construction compound which will be located 45 metres from a tributary of the Thorley Brook. A small cut off ditch or buffer system will be adopted to control any releases from the site. All potentially polluting substances will also be stored within containment bunds to Environment Agency standards.	YEL	Construction phase	YEL
Site activities: storage of oils, fuels and other substances will be within the site compound and in compliance with the Oil Storage Regulations. Storage will be within impervious storage bunds with 110% capacity, so that any spillage or leaks are contained. Throughout the construction best working practices will be adopted and measures to protect the water environment will be incorporated, adopting recommendations set out in the Environment Agency PPG notes.	Sub contractor / YEL	Construction phase	YEL
SHADOW FLICKER, AVIATION AND COMMUNICATION			
Shadow flicker could marginally affect two properties. The use of a grey finish on turbine towers and a grey semi-matt finish on the turbine blades will minimise the effects of reflected light. If shown to be necessary, any turbine shown to be responsible for shadow flicker can be programmed to shut down automatically for a short period until the sun has moved	YEL	Periodic during post construction phase	n/a
A pre-construction and post-construction television signal reception survey will be carried out to quantify the level and extent of interference and assess the appropriateness of mitigation measures. Mitigation will vary according to individual situations, but may include: • re-orientation of existing aerials to an alternative transmitter • installation of directional aerials to mildly affected properties • supplying cable or satellite television services (subject to parallel broadcast of terrestrial channels) • installation of a new repeater station in a location where interference can be avoided (this is more complex for digital but also less likely to be required for digital viewers) • switching from analogue to digital television broadcasts where available through the installation of 'free view' type digital receiver boxes.	YEL	post construction	YEL

Mitigation measure	Responsibility	Time scale	Cost to be covered by
Construction machinery will be checked regularly. Any maintenance required will occur over hardstanding or on a suitable impermeable ground cover. Refuelling will be limited to a designated area, on an impermeable surface, away from any drains or watercourses. Spill kits, absorbent pigs and absorbent sands will be available on site at all times. Any spills will be cleaned up as soon as possible, according to the spill response plan in the Working Practice Procedure, with any contaminated sands bagged up and disposed of correctly. Detailed descriptions of measures to be adopted will be set out in an Environmental Management Plan	Sub contractor / YEL / EA	Construction phase	n/a
Site activities There will be a need for routine maintenance of the wind farm. Maintenance personnel may bring oils, greases and other substances on site, with a minor potential for accidental spillage. However, such spillages (if they occur) will be very small and dealt with immediately by the site crew using appropriate spill kits.	Sub contractor	Duration of proposal	n/a
The site will be operated in accordance with best working practices and measures to protect the water environment will be in operations as set out with Environment Agency PPG notes.	Sub contractor / YEL/ EA	Duration of proposal	n/a
All vehicles visiting the site will be equipped with sand trays to place below any oil or fuel filling activities, and will also be equipped with emergency oil spillage kits.	Sub contractor / YEL	Construction phase	Sub contractor

Table 19.1: summary of mitigation measures for the West Wight Project