

Norfolk Boreas Offshore Wind Farm

Appendix 4.4

Preferred Landfall Location Technical Note

Environmental Statement

Volume 3

Applicant: Norfolk Boreas Limited
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REPORT

Landfall Site Selection Technical Note

Client: Norfolk Boreas Limited

Reference: PB5640

Revision: 0.1/Final

Date: 21 April 2016

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Project related



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1 Introduction

The purpose of this note is to present the outcomes of the risk assessment process that has been carried out by Royal HaskoningDHV in order to support Vattenfall Wind Power Limited (VWPL) in their landfall site selection process for both the Norfolk Vanguard and Norfolk Boreas projects. This risk assessment has been informed by:

- GIS data (Data sets provided by VWPL or freely available information)
- The Horizontal Directional Drill (HDD) 'HDD Feasibility Report' (Riggall and Associates Ltd; Appendix 4.1), provided by VWPL; and
- Natural England's consultation response following their review of the landfall locations on 20th April 2016.

2 Risk Assessment Methodology

The environmental assessment of each landfall location is presented below. Development considerations used for this risk assessment exercise have been divided in to the following categories to aid mapping, discussion and assessment:

- Populated areas;
- Local Authority boundaries;
- Existing infrastructure and utilities;
- Archaeology and cultural heritage (Scheduled Monuments);
- Terrestrial designated sites (Ramsar, Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Country Wildlife Sites (CWS), Local Nature Reserves (LNR), National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI), Areas of Outstanding Natural Beauty (AONB) and National Parks);
- Marine designated sites (Marine Conservation Zones (MCZs), SACs, SPAs)
- Land Use/type (Ancient woodland); and
- Hydrological features (Main Rivers and waterbodies associated with The Norfolk Broads).

Relevant development considerations found within the landfall areas (provided in GIS format by VWPL) have been identified and are shown on [Plate 1](#) to [Plate 5](#) that accompany this note. Following this, and a review of the HDD Feasibility Report (Appendix 4.1) and Natural England's consultation response (20th April 2016), a risk classification was attributed to the development considerations described above, based on a qualitative assessment and expert judgement. This assessment also includes a high level review of the marine designations that may need to be considered as a result of potential HDD exit points of the offshore export cable route for each landfall site. The risk classification system used is shown in [Table 1](#). [Table 2](#) presents the findings of the assessment, followed by a short description of the initial findings.

Table 1 Classification for development considerations

Grey	Hard constraint / unacceptable risk to the environment
Red	Major risk to the environment
Amber	Minor risk to the environment
Green	Consideration unlikely to pose risk to the environment

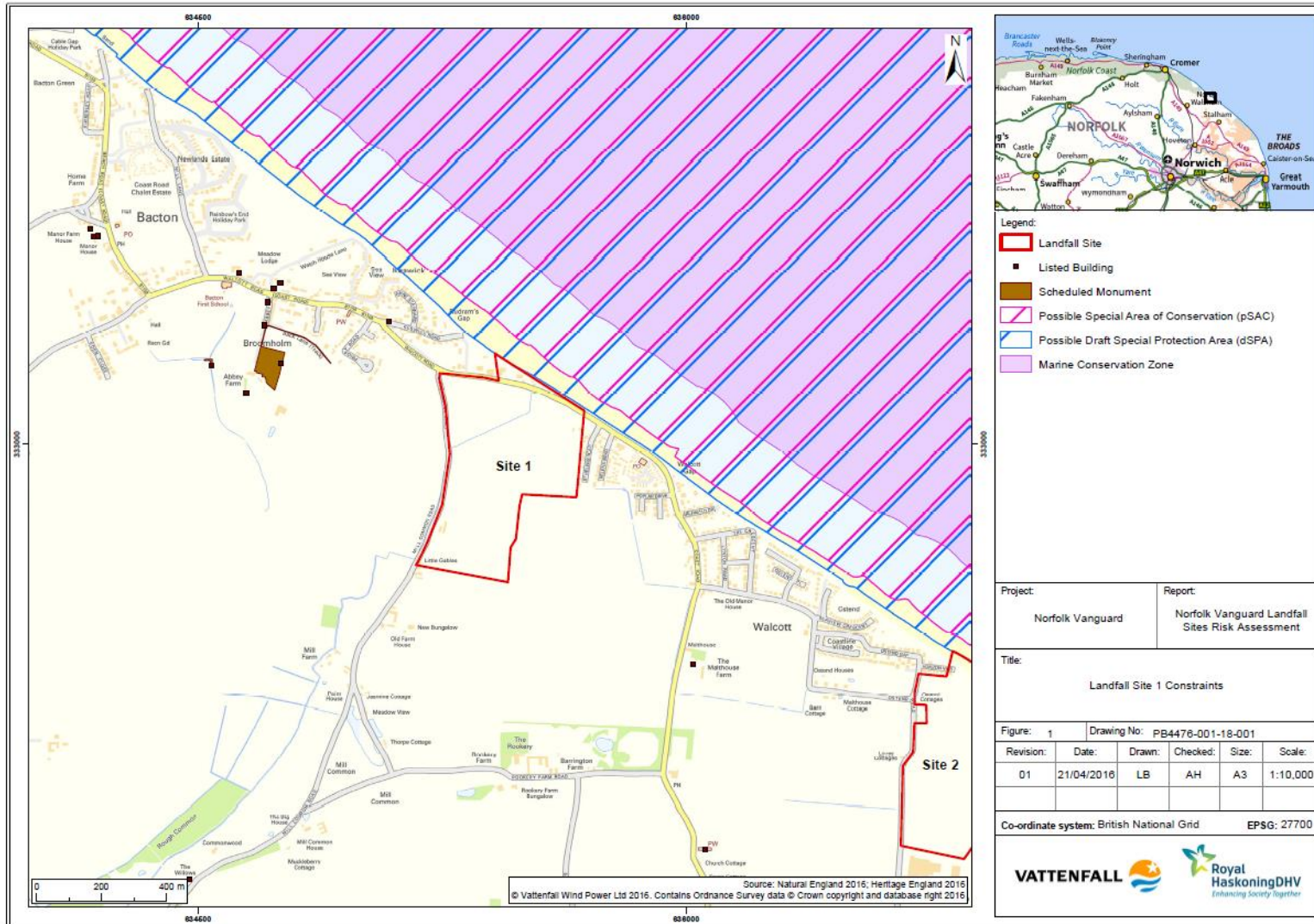


Plate 1 Landfall site 1 constraints

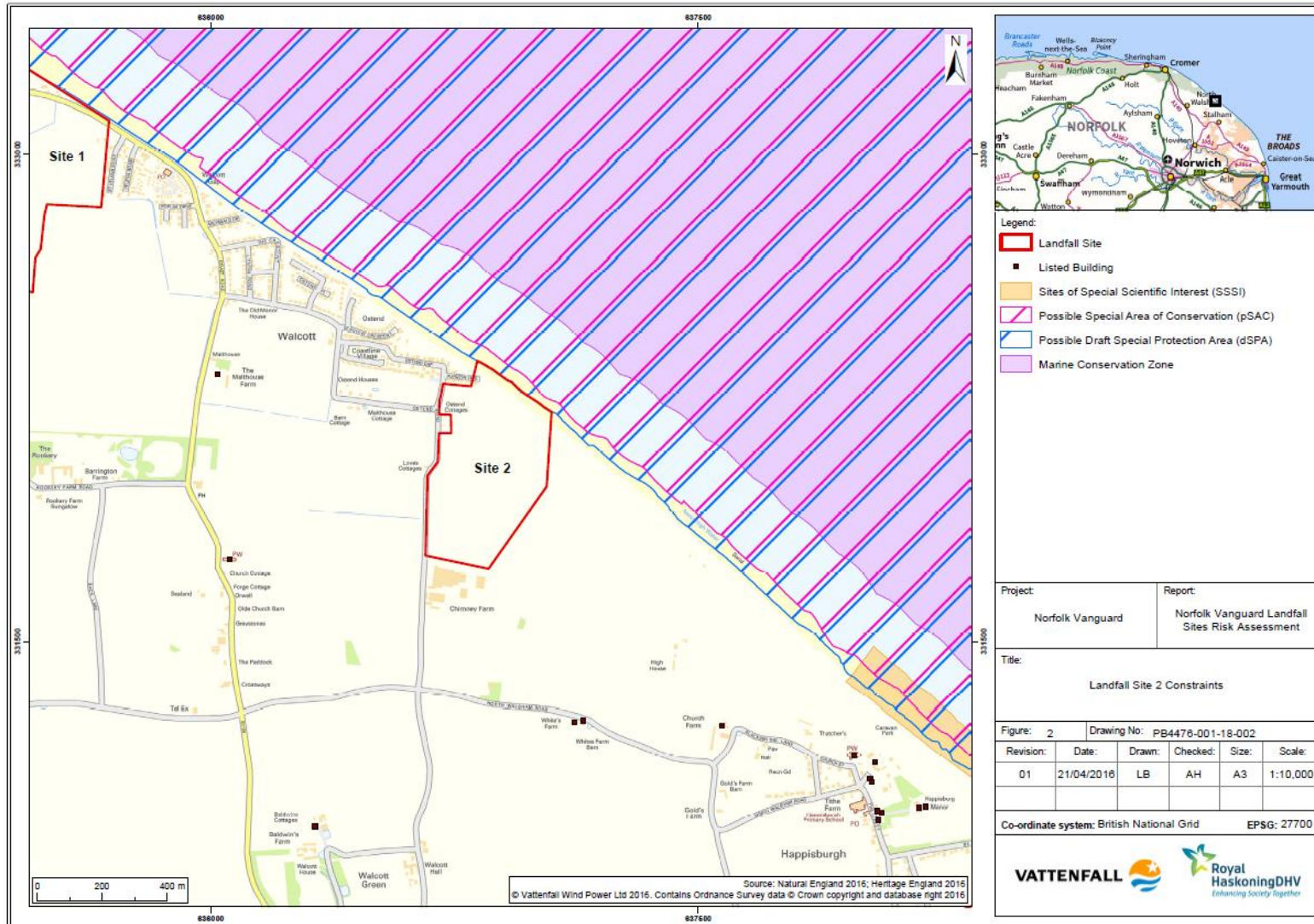


Plate 2 Landfall site 2 constraints

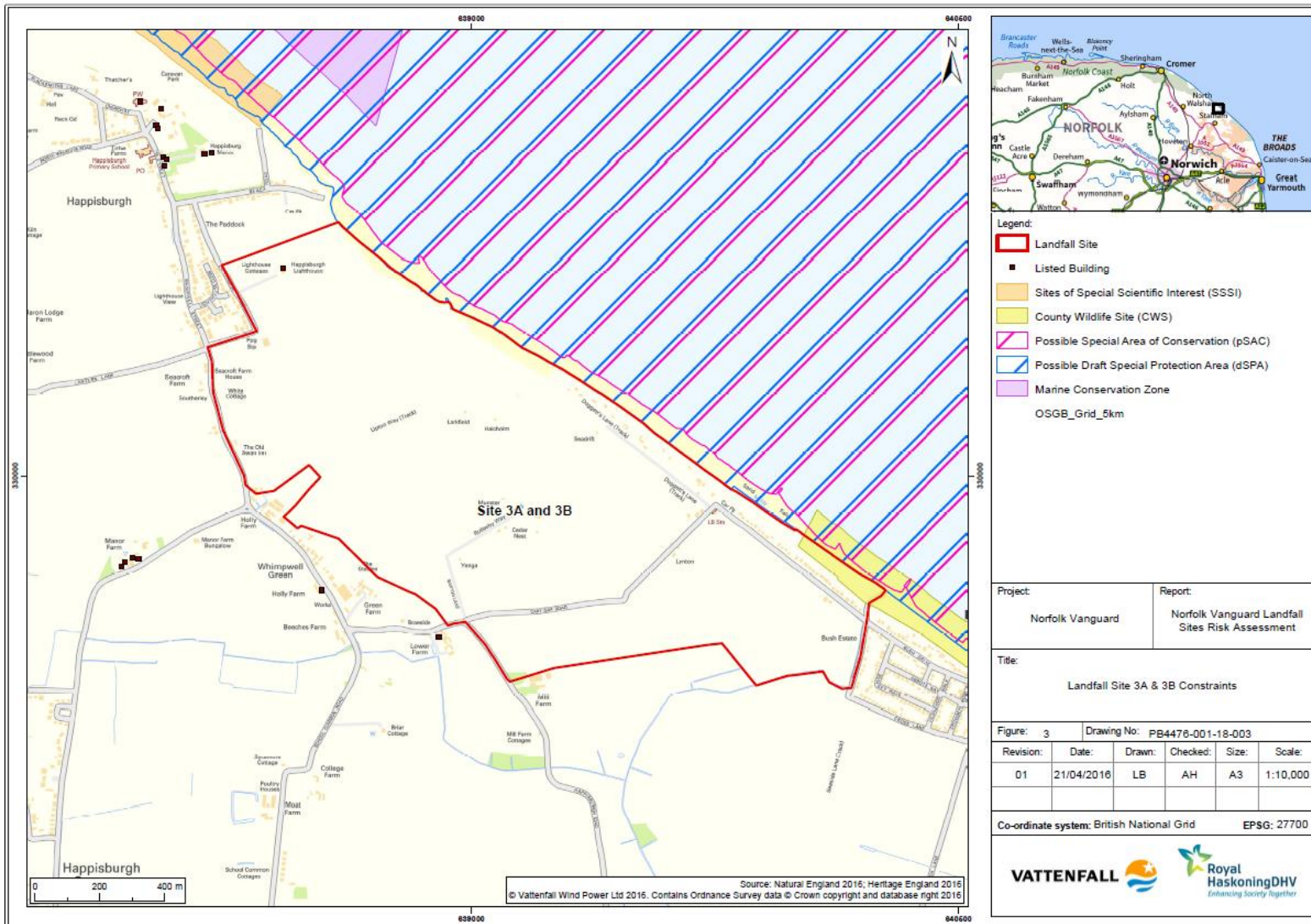


Plate 3 Landfall sites 3A&3B constraints

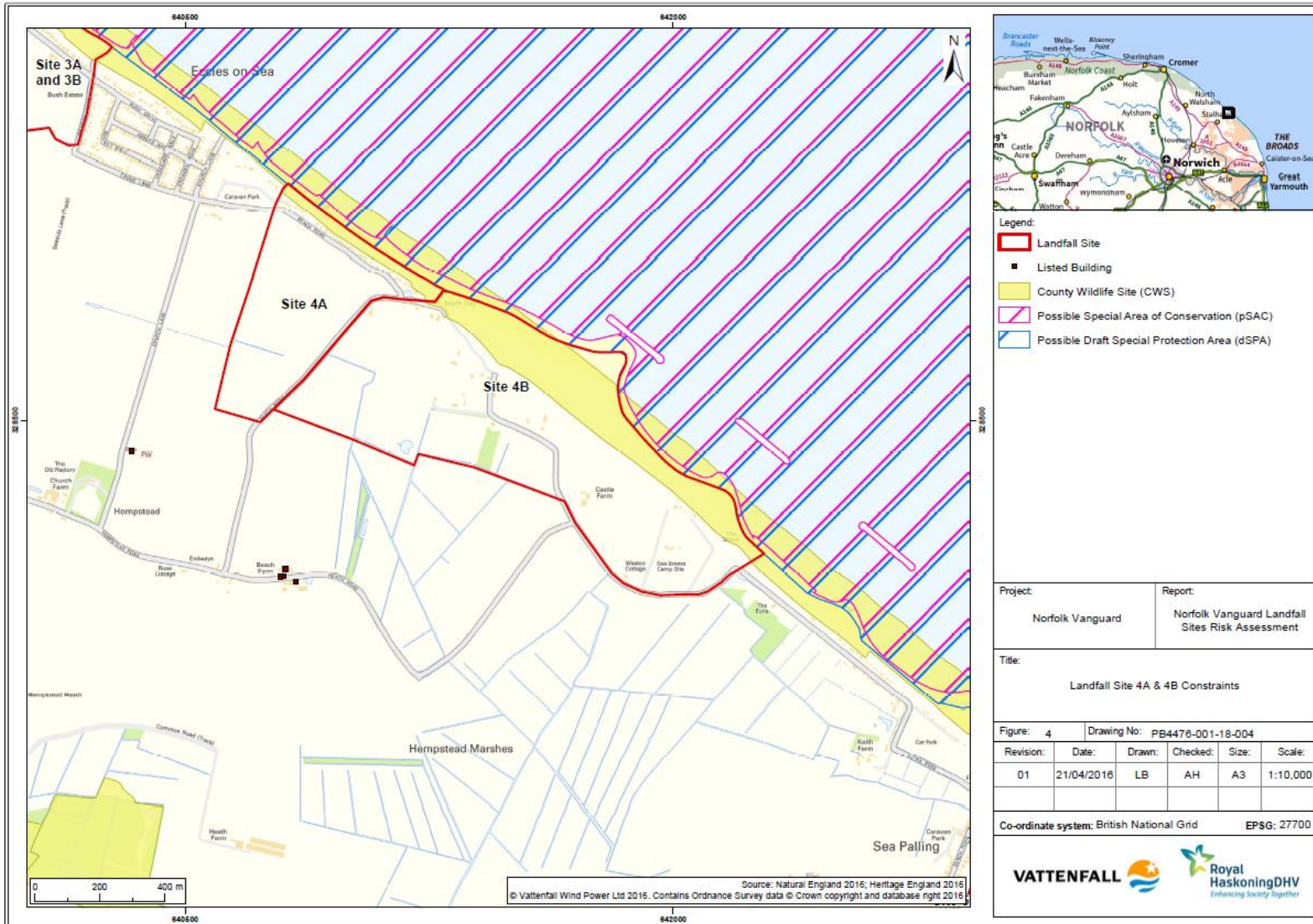


Plate 4 Landfall sites 4A&4B constraints

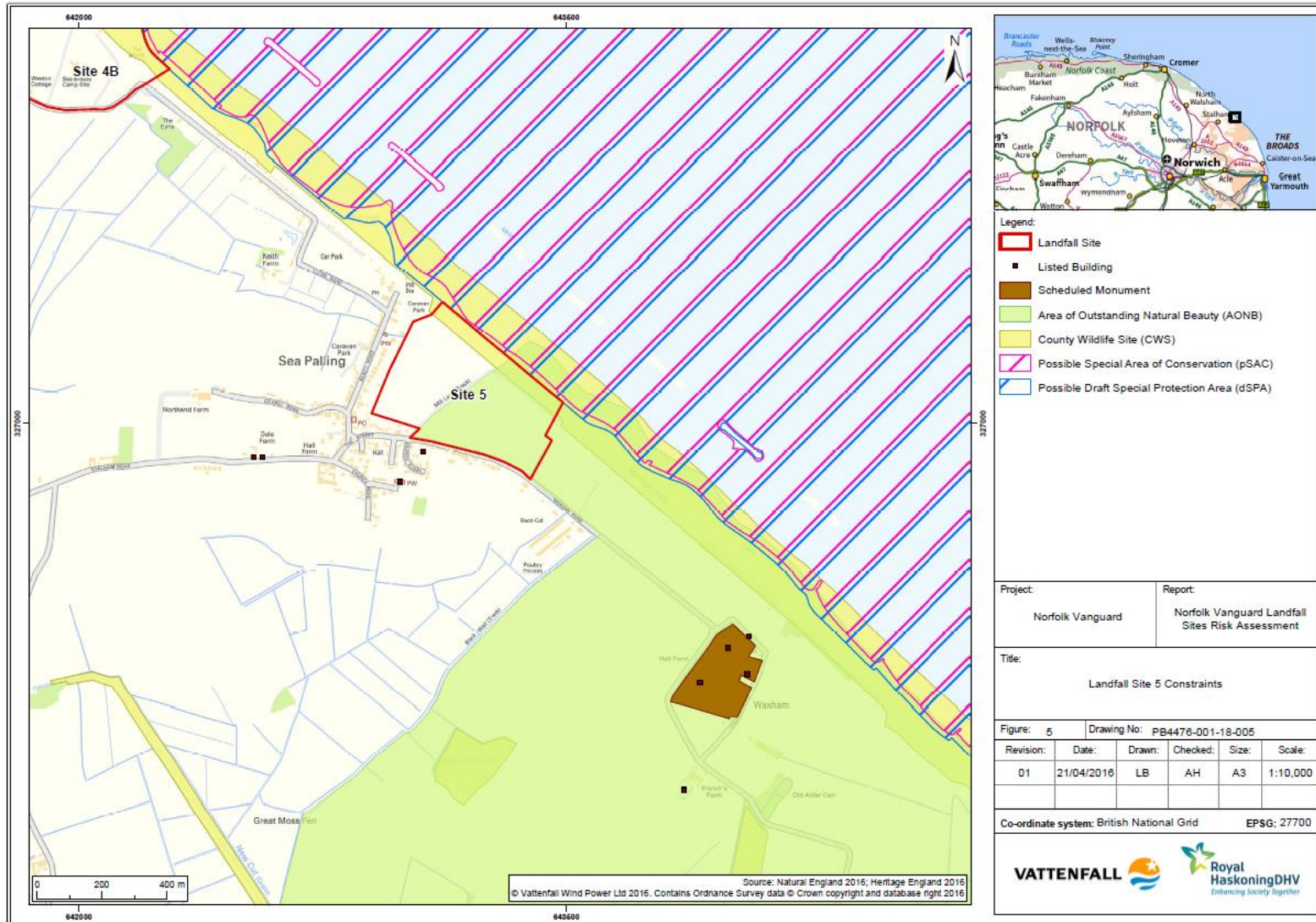


Plate 5 Landfall site 5 constraints

Table 2 Landfall Sites Risk Assessment

Topic	Considerations	Site 1	Site 2	Site 3a and 3b	Site 4a and 4b	Site 5
Area	Size of available area identified	21.02Ha (210,222m ²)	17.32Ha (173,187m ²)	149.21Ha (1,492,086m ²)	82.49Ha (824,875m ²)	17.18Ha (171,752m ²)
Local Planning Authority	Number of LPAs crossed by cable corridor	1 (North Norfolk District Council)	1 (North Norfolk District Council)	1 (North Norfolk District Council)	1 (North Norfolk District Council)	1 (North Norfolk District Council)
International Nature Conservation Designated Sites (Terrestrial)	SACs, SPAs, Ramsars	None	None	None	None	None
National Nature Conservation Designated Sites (Terrestrial)	SSSIs, Ancient Woodlands, National Nature Reserves, RSPB Reserves	None	None	None	None	None
Marine designated sites	MCZs	Cromer Shoal Chalk Beds MCZ; Southern North Sea pSAC; Greater Wash Marine dSPA	Cromer Shoal Chalk Beds MCZ; Southern North Sea pSAC; Greater Wash Marine dSPA	Southern North Sea pSAC Greater Wash Marine dSPA	Southern North Sea pSAC Greater Wash Marine dSPA	Southern North Sea pSAC Greater Wash Marine dSPA
National Landscape Designations	AONB, National Parks	None	None	None	None	Norfolk Coast AONB
Archaeology and Heritage of national importance	Registered Battlefields, Registered Parks and Gardens, Scheduled Ancient Monuments, World Heritage Sites	None	None	None	None	None
Archaeology and Heritage of local importance	Listed Buildings, Heritage Coast	None	None	1 x Grade II Listed Building	None	None

Topic	Considerations	Site 1	Site 2	Site 3a and 3b	Site 4a and 4b	Site 5
Local Nature Conservation Designated Sites	Local Nature Reserves, County Wildlife Sites, Forestry Commission Woodland	None	None	Marram Hills CWS	Marram Hills CWS	Marram Hills CWS
Road Crossings	A Road crossings	B road – B1159	None	None	None	None
Rail Crossings		None	None	None	None	None
Main River Crossings	EA designated main rivers	None	None	None	None	None
Buried Infrastructure	Gas pipelines, electricity cables	Unknown – however close proximity to Bacton Gas Terminal	Unknown	Unknown	Unknown	Unknown
Urban Areas		Bacton	Walcott	Happisburgh Whimpwell Green Eccles on Sea	Eccles on Sea	Sea Palling
Natural England review comments		Careful consideration of impacts to Cromer Shoal Chalk Beds MCZ	Careful consideration of impacts to Cromer Shoal Chalk Beds MCZ	Proximity of Happisburgh Cliffs SSSI	Important area for nesting little tern which are an Annex 1 species under the Birds Directive and a Schedule 1 species under the Wildlife and Country Act.	None
Risk Summary						

Risks for each element of the connection have been summarised using the following standard procedure, and results can be found in [Table 3](#).

- High Risk (Red): e.g. One or more major risk items identified within the element of the connection;
- Medium Risk (Orange): e.g. Two or more minor risk items identified; and
- Low Risk (Green): e.g. One or less minor risk items identified.

3 Overview and summary of initial assessment findings

Table 3 Environmental Risk Assessment Summary

Risk Summary	Site 1	Site 2	Site 3a and 3b	Site 4a and 4b	Site 5

Site 1

For landfall site 1, there is the potential that the HDD exit point, the export cable, or both will be within the Cromer Shoal Chalk Beds MCZ. Natural England advises that a cable route through this MCZ will require provision of evidence that the works will not impact the conservation objectives of the MCZ. This represents a significant environmental risk to this landfall option. The Southern North Sea pSAC and Greater Wash Marine dSPA at this stage are not yet designated and so represent a minor risk; this risk is present for all the landfall options.

Site 2

As with Site 1, the HDD exit point, the export cable or both will be within the Cromer Shoal Chalk Beds MCZ. Natural England advises that a cable route through this MCZ will require provision of evidence that the works will not impact the conservation objectives of the MCZ. This represents a significant environmental risk to this landfall option. The Southern North Sea pSAC and Greater Wash Marine dSPA at this stage are not yet designated and so represent a minor risk; this risk is present for all the landfall options.

Site 3a and 3b

Marram Hills CWS represents a very low environmental risk for both Site 3a and 3b. Natural England also noted the proximity (0.4km) of Happisburgh Cliffs SSSI, which is designated for geological features; however this is not expected to pose an environmental risk. Consideration should be given to the proximity of residential areas to this site, however this is not considered to be significant environmental risk. The Southern North Sea pSAC and Greater Wash Marine dSPA at this stage are not yet designated and so represent a minor risk; this risk is present for all the landfall options.

Site 4a and 4b

Marram Hills CWS represents a very low environmental risk for this option. The Southern North Sea pSAC and Greater Wash Marine dSPA at this stage are not yet designated and so represent a minor risk; this risk is present for all the landfall options. Natural England has noted that this landfall site is becoming increasingly important for nesting little tern, which are an Annex 1 species under the Birds Directive and a Schedule 1 species under the Wildlife and Country Act. This is therefore a sensitive feature of this site which would need careful consideration during any environmental assessment and future construction activity.

Site 5

The location of site 5 within the Norfolk Coast AONB represents a risk, although as impacts will only be temporary in nature, the risk is considered minor; however there is likely to be a requirement for significant consultation and justification for use of this site. Natural England raised no concerns to landfall site 5. In addition, further along the coast to site 5, distance to the designated sites associated with The Broads decreases and therefore increases potential environmental challenges. The Southern North Sea pSAC and Greater Wash Marine dSPA at this stage are not yet designated and so represent a minor risk; this risk is present for all the landfall options

4 Summary

From this Risk Assessment exercise, this assessment recommends that Landfall sites 3a and 3b present the lowest environmental risk options.