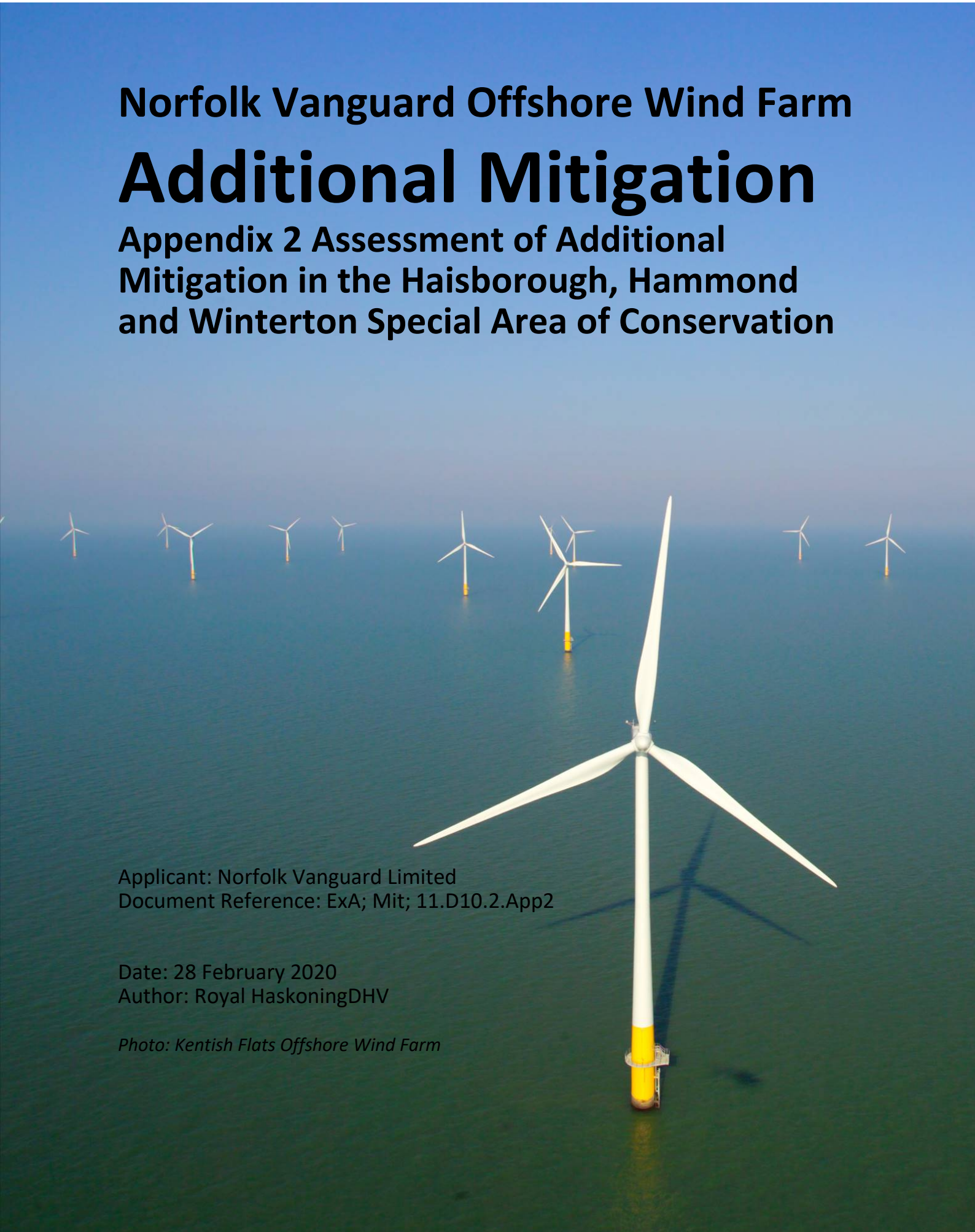
VATTENFALL

Norfolk Vanguard Offshore Wind Farm

Additional Mitigation

Appendix 2 Assessment of Additional Mitigation in the Haisborough, Hammond and Winterton Special Area of Conservation



Applicant: Norfolk Vanguard Limited
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Author: Royal HaskoningDHV

Photo: Kentish Flats Offshore Wind Farm

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1 INTRODUCTION

1. In accordance with the Department for Business, Energy and Industrial Strategy (BEIS) letter of 6 December 2019 which states the following, Norfolk Vanguard Limited ('the Applicant') is proposing additional specific mitigation for the potential effects of cable protection on the Haisborough, Hammond and Winterton (HHW) Special Area of Conservation (SAC) (see Section 2):

   'The Applicant in consultation with the Marine Management Organisation and Natural England as necessary, is invited to provide information on the specific mitigation solutions that would address the potential effects of cable protection on the SAC features."

2. The Applicant has consulted extensively with the Marine Management Organisation (MMO) and Natural England (NE) on the additional mitigation and in order to understand its effectiveness, NE requested further assessment (provided in this document). This document sets out the further assessment of the HHW SAC in relation to the new proposed mitigation measure. A description of the mitigation measures is provided in Section 2, the proposed approach to the assessment is provided in Section 3 and the assessment of effects is provided in Section 5.

3. This assessment provides supplementary information to that provided in the original Norfolk Vanguard Information to Support Habitats Regulations Assessment (HRA) report (document 5.3).

2 PROPOSED NEW MITIGATION MEASURES

4. As set out in the Additional Mitigation document (document reference ExA; Mit; 11.D10.2), in response to the BEIS letter, the Applicant is proposing further mitigation to that offered during the examination for Norfolk Vanguard in order to further reduce the potential effects of cable protection on the HHW SAC.

2.1 No cable protection in priority areas to be managed as reef

5. A new commitment has been made by the Applicant to use no cable protection in the "*priority areas to be managed as S. spinulosa Annex I reef*" identified by NE within the HHW SAC (as reflected in Figure 1 on page 12 of Natural England's Deadline 6 submission (REP6-032) and shown in Figure 1 below), unless otherwise agreed with the MMO in consultation with NE.

2.1.1 Areas to be managed as reef

6. The areas to be managed as *S. spinulosa* Annex I reef have formed the basis for management within the HHW SAC and as a result two fisheries management areas have been proposed to protect the areas where *S. spinulosa* reef is most likely to recover. One of the closures has been proposed by DEFRA and one by the Eastern Inshore Fisheries and Conservation Authority (IFCA)) both of which, if implemented, would overlap with the Project offshore cable corridor.

7. The management areas have been identified with the aim of enabling the priority areas to be managed as *S. spinulosa* Annex I reef to recover to favourable condition in accordance with the Conservation Objectives for the site (see Section 4). These areas have been identified as areas with high confidence that the existing reef will increase in extent if the recurring impact from bottom towed fishing gear ceases in these areas.

2.1.1.1 DEFRA management areas

8. As stated in the MMO's Deadline 6 submission (REP6-030), fisheries management measures in offshore waters must be agreed by other Member States with an active interest in the site. With regards to the DEFRA fisheries management area, at the time of writing, this designation does not appear to have progressed since a draft recommendation[1] was produced by DEFRA in 2016 and there is a high level of uncertainty that this designation will progress in advance of Norfolk Vanguard construction (proposed to commence in 2025). Agreement has not been reached with the Member States for the proposed management area and therefore the

[1] https://lbst.dk/fileadmin/user_upload/NaturErhverv/Filer/Fiskeri/Natura_2000_hav/Fiskeriregulering_i_andre_lande/WORKING_Draft_NNSSR_HWW_Joint_Recommendation_v0.7.pdf

likelihood of this management measure being successfully implemented appears to be low. The timescale for this management measure is highly uncertain and likely to be many years away. It is therefore unlikely that this damaging pressure will be removed and therefore that any *S. spinulosa* Annex 1 reef will have restored in this management area, at the point at which cable protection for the Project is installed.

2.1.1.2 EIFCA Byelaw

9. Based on the EIFCA's Deadline 7 submission (REP7-068), the Applicant understands the proposed small byelaw area in the inshore part of the Norfolk Vanguard offshore cable corridor is currently in a period of review by the MMO and DEFRA and could be implemented in 2020, if accepted. It is however noted that there is limited fishing activity at the proposed EIFCA byelaw area and therefore, should this byelaw be implemented, it is uncertain whether there will be a significant change in the habitat condition and extent of *S. spinulosa* Annex I Reef.

2.2 Decommissioning cable protection

10. Following a review of the supply chain, the Applicant has made a commitment to decommission cable protection at the end of the Norfolk Vanguard project life where it is associated with unburied cables due to ground conditions (where required for crossings this will be left *in situ*).

11. Further detail on the methods for decommissioning is provided in Appendix 3 of the Additional Mitigation document (document reference ExA; Mit; 11.D10.2.App3).

2.2.1 This commitment ensures that there will be no permanent habitat loss as a result of cable protection. Removal of disused cables

12. Every effort is being made by the Applicant to reduce the number of crossings by removing disused cables where agreement can be reached with the cable owners. An Out of Service Cable Recovery Agreement has been discussed with BT Subsea who own a number of out of service assets within the HHW SAC. Appendix 4 (document reference ExA; Mit; 11.D10.2.App4) demonstrates the advanced stages of these discussions.

13. While it is recognised that this does not represent mitigation at this stage and has therefore not been considered in this assessment, it is likely that this will reduce the number of crossings from six to two per cable and will therefore reduce the volume of cable protection associated with cable crossings.

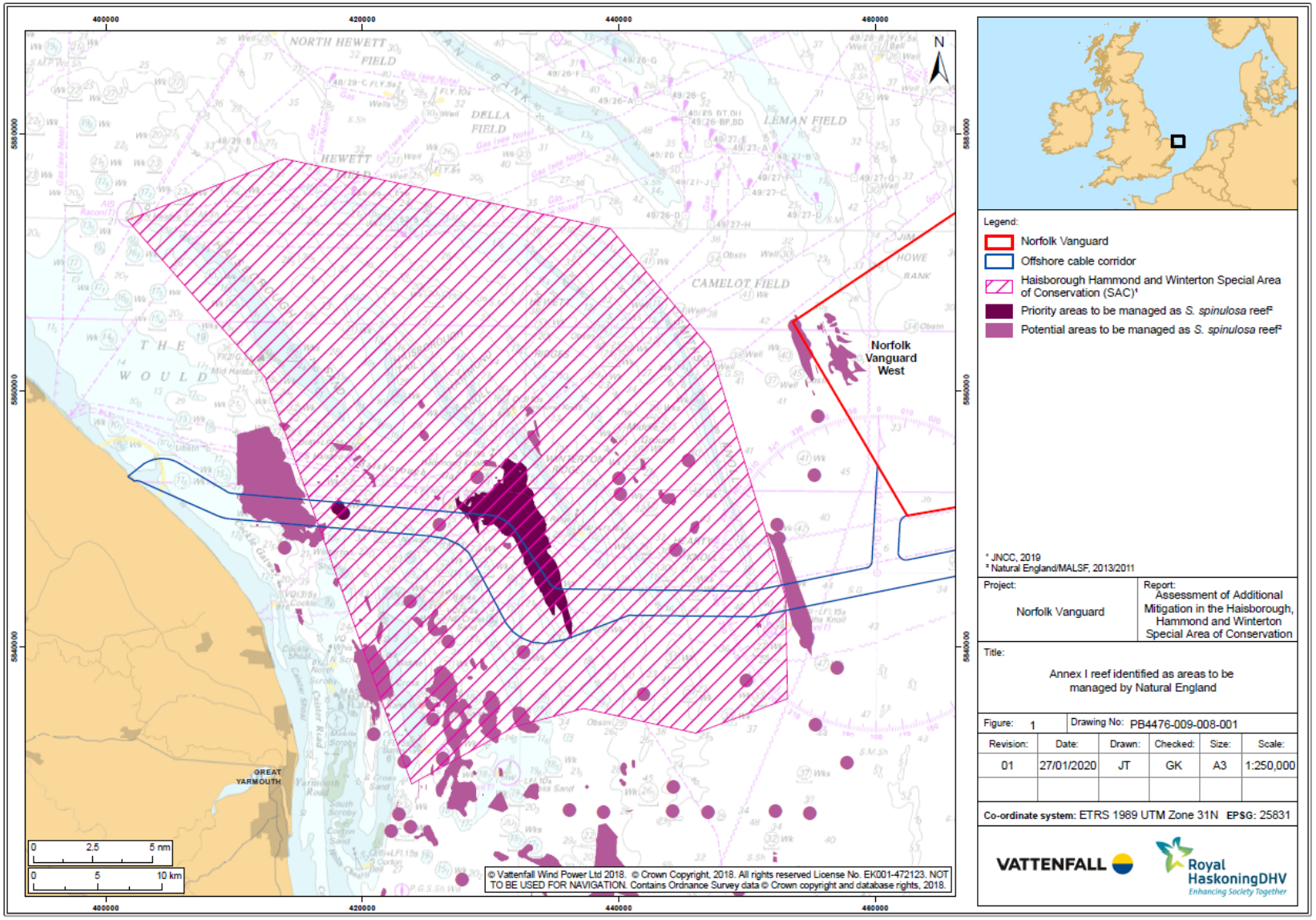

Figure 1 Priority Areas to be Managed as *S. spinulosa* Annex I reef by Natural England

3 APPROACH TO ASSESSMENT

3.1 Overview

14. Further assessment of the HHW SAC in relation to cable protection has been undertaken based on the additional mitigation measures being proposed by the Applicant (described in Section 2).

15. It is noted that an assessment of long term habitat loss on *S. spinulosa* Annex I reef was not provided in the original Norfolk Vanguard Information to Support HRA report (document 5.3) due to the Applicant's position that cable protection can be colonised by *S. spinulosa* reef and that this would provide the same function in terms of biodiversity and is therefore not a loss of habitat. However, it is acknowledged that NE's position is that whilst *S. spinulosa* can be expected to colonise cable protection, this is not on a natural substrate and therefore NE does not consider this an Annex 1 Habitat (Natural England's generic position on cable protection, submitted at Deadline 4 of the Norfolk Vanguard Examination). As a result, the assessment provided in Section 5.1 considers long term habitat loss of Annex 1 Reef as a worst case scenario.

16. Where cable protection is required due to pipeline / cable crossings this will not be treated as Annex I habitat in the assessment in accordance with NE advice that *S. spinulosa* reef growing on artificial substrate is not Annex I reef and in accordance with NE's Norfolk Boreas Pre 22nd January 2020 Issue Specific Hearing Updated Benthic Ecology Advice, which states *"Natural England is less concerned about cable crossing points compared to un-impacted areas, as it is unlikely for reef to be present."*

3.2 Approach

17. In accordance with the 'Natural England advice note regarding consideration of small scale habitat loss within SACs in relation to cable protection' submitted at Deadline 4 (REP4-062), the assessment considers the following:

- Location of the predicted habitat loss in terms of whether it overlaps a designated or supporting feature of the site;
- Duration of the loss;
- Scale of the loss in relation to the feature / sub feature of the site including consideration of the quality and rarity of the affected area;
- Impact on structure, functioning or supporting processes of the habitat;
- Feature condition; and
- Existing habitat loss within the same site/ feature/ sub feature.

18. The advice from NE also states whilst there are no 'hard and fast' rules or thresholds, in order for NE to advise that there is no likelihood of an adverse effect the Project would need to demonstrate the following:

- That the loss is not on the priority habitat/feature/ sub feature/ supporting habitat; and/or
- That the loss is temporary and reversible (within guidelines above); and/or
- That the scale of loss is so small as to be *de minimus* alone; and/ or
- That the scale of loss is inconsequential including other impacts on the site/ feature/ sub feature

19. The assessment has also considered the Conservation Objectives (Section 4) and targets within the Supplementary Advice for the HHW SAC and uses NE's areas to be managed as Reef (Figure 2) and areas to be managed as Sandbank (Figure 3) as the baseline for the assessment.

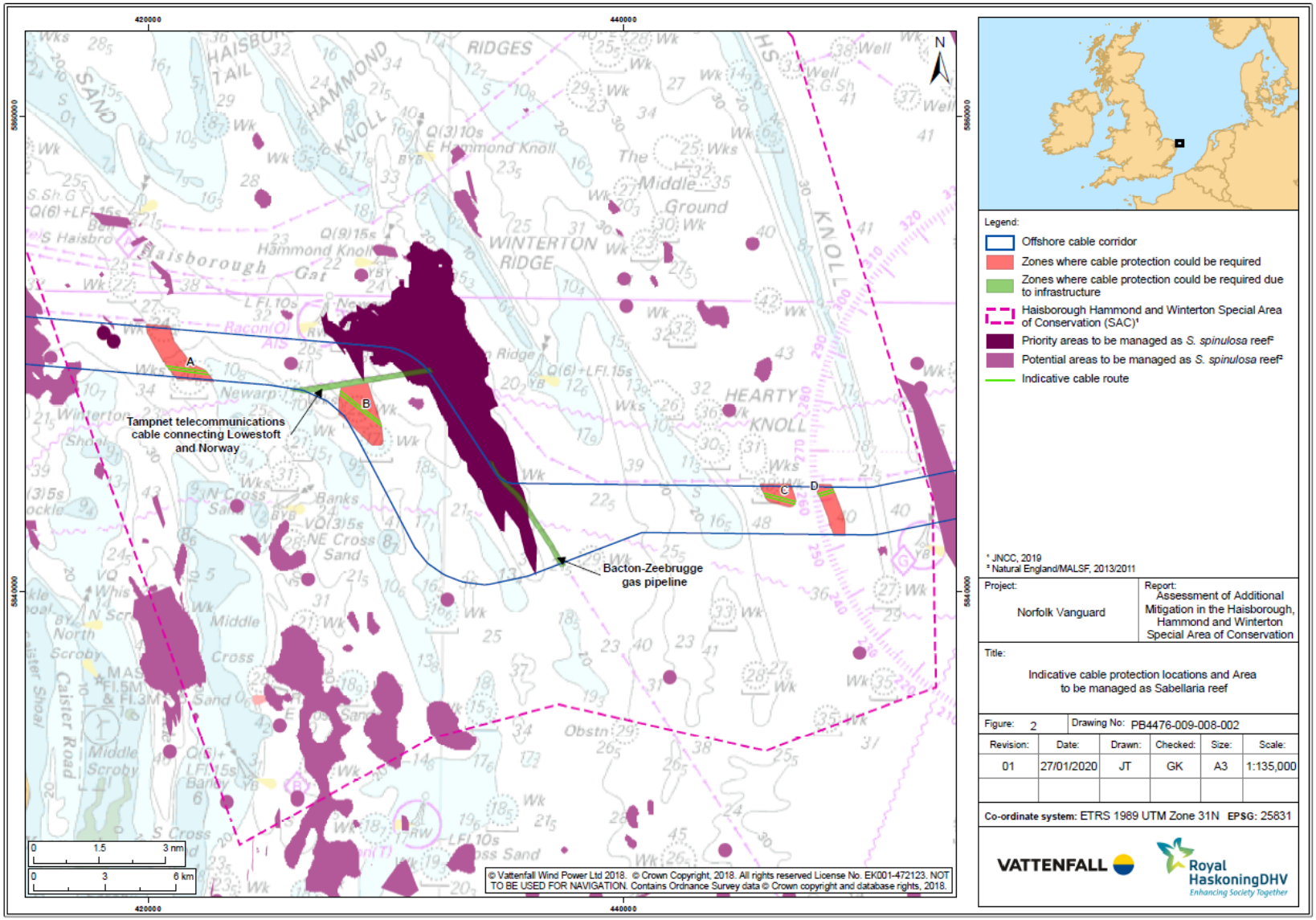

Figure 2 Indicative Cable Protection locations and Areas to be managed as *S. spinulosa* Annex I reef

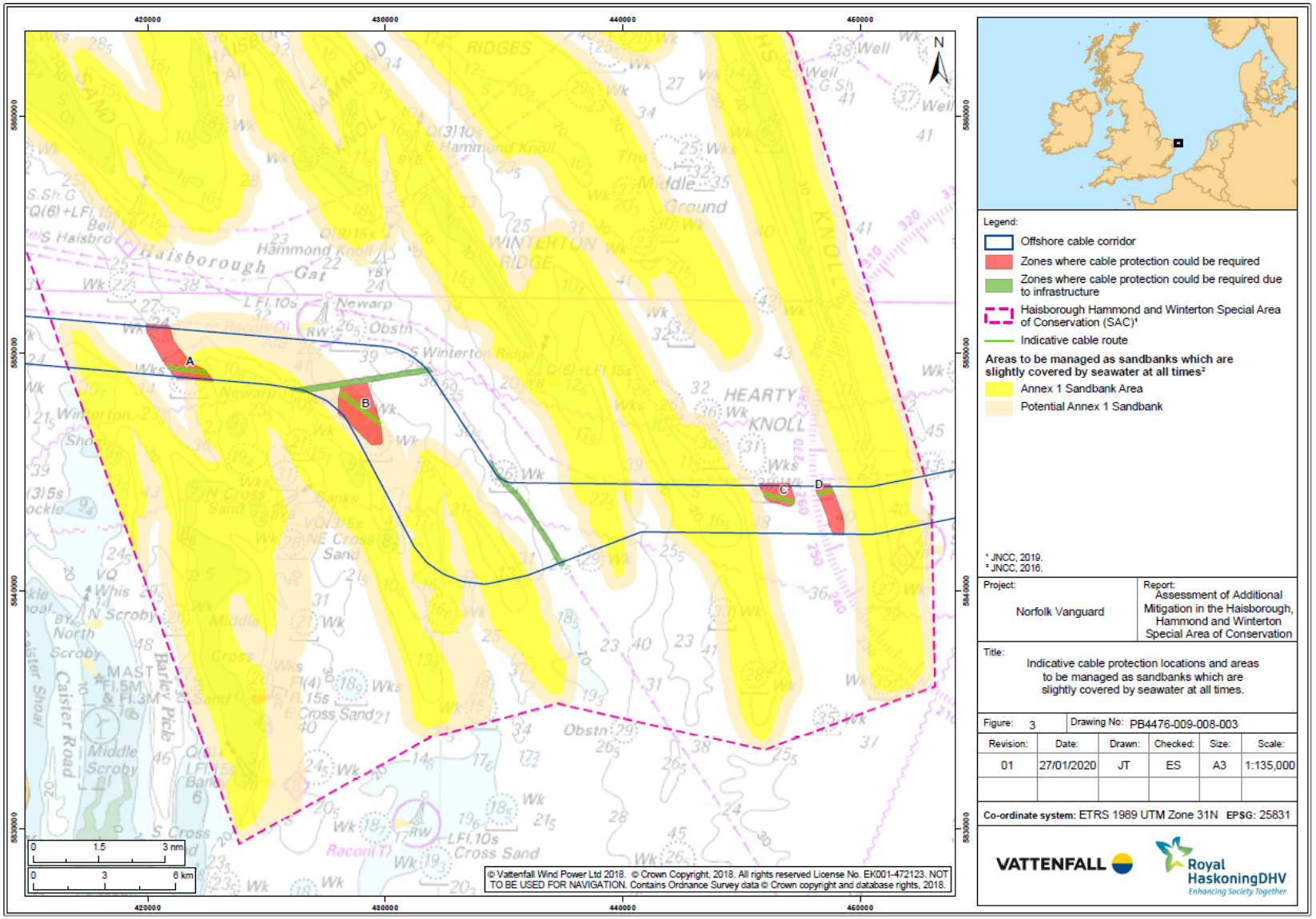

Figure 3 Indicative Cable Protection locations and Areas to be managed as Annex 1 Sandbank

3.3 Cable Protection Worst Case Scenario

20. The worst case scenario for deployment of cable protection incorporates the new mitigation outlined in Section 2 in addition to the various mitigation commitments made prior to submission of the DCO application, as well as commitments made during the Norfolk Vanguard Examination and the ongoing Norfolk Boreas Examination (see below).

21. The Applicant committed to use an HVDC export solution in order to reduce the number of cables and cable protection. This results in the following mitigating features in relation to cable protection:

- There will be two cable installations instead of six for Norfolk Vanguard (and the same for Norfolk Boreas);
- The potential quantities of cable protection in the unlikely event that cables cannot be buried is reduced due to the reduction in the number of cables; and
- The number of export cables required to cross existing cables and pipelines and the associated cable protection is reduced; and
- The space required for cable installation is reduced, increasing the space available within the cable corridor for micrositing to increase burial success and avoid constraints such as *S. spinulosa* reef.

22. An interim survey in 2020 and pre-construction survey within 12 months of any cable installation works will be undertaken. The detailed cable route, including micrositing will be determined based on the results of the interim and pre-construction surveys and must be agreed with the MMO in consultation with NE before any installation works can commence.

23. Cables will be buried where the substrate allows burial to a depth of at least 1m and appropriate burial tools will be selected following the preconstruction surveys in order to maximise cable burial success and minimise the requirement for cable protection.

24. A maximum of 5% of the cable length within the HHW SAC may require cable protection due to insufficient ground conditions for burial. This is reduced from 10% in the original DCO application based on evidence from an interim cable burial study (provided in Appendix 2 of the HHW SAC Site Integrity Plan (document 8.20)).

25. Total habitat loss within the HHW SAC could be up to 32,000m^2 (0.03km^2) based on the following:

- 12,000m^2 as a result of up to six crossings for each of the export cable pairs (12 crossings in total) within the HHW SAC.
    - Each crossing could require up to 100m length and 10m width of protection.
    - Every effort is being made by the Applicant to reduce the number of crossings by removing disused cables where agreement can be reached with the cable owners. An out of service cable recovery agreement has been discussed with BT Subsea. Appendix 4 (document reference ExA; Mit; 11.D10.2.App4) demonstrates the advanced stages of these discussions, with a formal agreement expected to be in place imminently.
    - Cable protection at crossings would be left *in situ* at the end of the project life, however as noted above this cannot be Annex I reef, in accordance with NE advice that *S. spinulosa* reef growing on artificial substrate is not Annex I reef.
- 20,000m^2 as a result of up to 5% of the cable length in the SAC (2km of cable protection per cable pair, 4km in total) potentially requiring cable protection in the unlikely event that unsuitable ground conditions are encountered. A 5m width of cable protection could be required.
    - If required, this would only be deployed outside the priority areas to be managed as reef in the HHW SAC.
    - If required, this would be decommissioned and therefore a long term (not permanent) impact.

4 CONSERVATION OBJECTIVES

4.1 Overview

26. Conservation objectives are set to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of the qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of the qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The population of qualifying species;
- The distribution of qualifying species within the site

4.2 Favourable condition

27. 'Favourable Condition' is the term used in the UK to represent 'Favourable Conservation Status' for the interest features of SACs. For an Annex I habitat, Favourable Conservation Status occurs under the Habitats Directive when (JNCC and Natural England, 2013):

- Its natural range and area it covers within that range are stable or increasing;
- The specific structure and functions, which are necessary for its long-term maintenance, exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

28. Favourable condition of the sandbanks and reefs is assessed based on the long-term maintenance of the following (JNCC and Natural England, 2013):

- Extent of the habitat (and elevation and patchiness for reef);
- Diversity of the habitat;
- Community structure of the habitat (population structure of individual species and their contribution to the functioning of the habitat); and
- Natural environmental quality (e.g. water quality, suspended sediment levels).

4.2.1 Targets for achieving Favourable Condition

4.2.1.1 Annex I *S. spinulosa* reef

29. Natural England's Supplementary Advice Targets[2] for Annex I Reef are outlined in Table 4.1.

Table 4.1 Supplementary Advice Targets of Relevance to Norfolk Vanguard

Attribute	Target
Distribution: presence and spatial distribution of biological communities	Restore the presence and spatial distribution of reef communities.
Extent of subtidal biogenic reef	When Sabellaria reef develops within the site, its extent and persistence should not be compromised by human activities, accepting that, due to the naturally dynamic nature of the feature, its extent will fluctuate over time.
	Restore the total extent and spatial distribution and types of reef (and each of its subfeatures).
Structure and function: presence and abundance of key structural and influential species	Maintain OR Recover OR Restore the abundance of listed species, to enable each of them to be a viable component of the habitat.
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.
Structure: population density	Restore the density of Sabellaria species across the feature.
Structure: species composition of component communities	Restore the species composition of component communities.
	Restore the species composition of the Sabellaria reef community.
Supporting processes: areas with conditions suitable for reef formation	Restore the environmental conditions in those locations that are known, or which become known, to be important for Sabellaria reef formation.
	Maintain the natural rate of sediment deposition.
	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat
	Maintain the natural water flow velocity to the subtidal Sabellaria reefs, to provide high levels of oxygen, sediment supply and food.

2 https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030369&SiteName=haisborough&SiteNameDisplay=Haisborough%2c+Hammond+and+Winterton+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

4.2.1.2 Annex I Sandbank

30. Natural England's Supplementary Advice Targets for Annex I Sandbank are outlined in Table 4.1.

Table 4.2 Supplementary Advice Targets of Relevance to Norfolk Vanguard

Attribute	Target
Distribution: presence and spatial distribution of biological communities	Restore the presence and spatial distribution of subtidal sandbank communities.
Extent and distribution	Restore the total extent and spatial distribution of subtidal sandbanks to ensure no loss of integrity, while allowing for natural change and succession.
Structure and function: presence and abundance of key structural and influential species	Maintain OR Recover OR Restore the abundance of listed species, to enable each of them to be a viable component of the habitat.
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.
Structure: sediment composition and distribution	Restore the distribution of sediment composition across the feature (and each of its sub-features).
Structure: species composition of component communities	Restore the species composition of component communities.
Structure: topography	Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human-induced activity.
Structure: volume	Maintain the existing (where no previous evidence exists) or best-known (where some evidence exists) volume of sediment in the sandbank, allowing for natural change.
Supporting processes: sediment movement and hydrodynamic regime	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.

5 ASSESSMENT OF EFFECTS

5.1 Long term loss of Annex I Reef

31. As stated in Section 3, the assessment focuses on the effect of habitat loss only as this is the only effect that is of relevance to the new mitigation; avoidance of cable protection in the areas to be managed as *S. spinulosa* Annex I reef by NE. All other effects are assessed in the Information to Support HRA report (document 5.3).

32. As discussed in Section 3.3, micrositing will be undertaken to avoid *S. spinulosa* reef where possible and therefore it is highly unlikely that there would be any cable protection in areas of *S. spinulosa* reef and therefore there will be no loss of existing reef. Based on current data there is likely to be space to microsite cables through existing reef, as recognised in NE's Relevant Representation for Norfolk Vanguard states "*Whilst Natural England understands that on the basis of survey data at this point there should be room to microsite around reef in cable corridor, we note that this may not be the case pre construction.*"

33. The Applicant acknowledges the potential for *S. spinulosa* to extend prior to construction but notes that the basis for this would largely be as a result of fisheries management measures in the priority areas to be managed as reef which are highly uncertain and which the Applicant has now committed to avoiding.

5.1.1 Location of habitat loss

34. There will be no loss of an Annex I priority natural habitat[3] as a result of cable protection as there are no priority natural habitats within the HHW SAC.

35. The potential location of habitat loss due to the cable protection required within HHW SAC is indicated in Figure 2, showing that the areas where cable protection may be required are outside areas to be managed as *S. spinulosa* Annex I Reef. NE and JNCC have identified these areas of potential *S. spinulosa* reef habitat as a management measure in order to meet the conservation objectives for Annex I reefs, as they consider those are areas where there is high confidence that *S. spinulosa* has potential to increase in extent if damaging pressures (i.e. from bottom towed fishing gear) are removed. Therefore, if these areas are avoided, the cable protection cannot hinder the achievement of the conservation objective of maintain or restore the *S. spinulosa* Annex I reef to a favourable condition. Therefore, this

[3] As stated in the Habitats Directive, priority natural habitat types means natural habitat types in danger of disappearance, which are present on the territory referred to in Article 2 and for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory referred to in Article 2; these priority natural habitat types are indicated by an asterisk (*) in Annex I of the Habitats Directive;

ensures that any small scale long term loss of habitat within the SAC would be inconsequential to the conservation objectives of Annex I reef.

5.1.2 Duration of habitat loss

36. The duration of habitat loss is expected to be approximately 30 years in line with the expected design life of the project.

5.1.3 Scale of habitat loss

37. As discussed above, micrositing will be undertaken to avoid *S. spinulosa* reef where possible and therefore it is highly likely that there will be no loss of existing reef. Based on current data there is likely to be space to microsite cables through existing reef, as recognised in NE's Relevant Representation for Norfolk Vanguard. The Applicant acknowledges the potential for *S. spinulosa* to extend prior to construction but notes that the basis for this would largely be as a result of fisheries management measures which remain highly uncertain, as discussed previously.

38. As demonstrated in Section 5.1.1 there will be no loss of areas to be managed as *S. spinulosa* Annex I reef, therefore the scale of loss would not be significant, and any loss would not prevent achievement of the conservation objectives for *S. spinulosa* Annex I reef within HWW SAC.

39. With regards to *S. spinulosa* Annex I reef outside the areas to be managed as reef, the Application has committed to micrositing around any *S. spinulosa* Annex I reef identified during the pre-construction surveys where there is sufficient space to do so, unless otherwise agreed with the MMO in consultation with NE. Therefore, there is not expected to be any cable protection in areas of existing *S. spinulosa* Annex I reef.

40. As discussed in the Information to Support HRA report (document 5.3), Norfolk Vanguard Limited commissioned a Cable Constructability Assessment by Global Marine Systems Ltd (provided in Appendix 4.2 of the ES) to determine an appropriate cable corridor width of approximately 2km to 4.7km (a combined corridor for Norfolk Vanguard and Norfolk Boreas).

41. The space available for micrositing within the offshore cable corridor where it overlaps with the HHW SAC is approximately 1.05km along most of the route (where the corridor width is 2km), with up to 3.75km of micrositing available in the 'dog-leg' area (where the corridor width is 4.7km). This takes into account the space required

for Norfolk Boreas export cables[4]. The space available for micrositing is based on the following worst case scenario:

- Up to four export cable trenches (four cables in 2 trenches for Norfolk Vanguard and four cables in two trenches for Norfolk Boreas) with spacing as shown in Plate 5-1;
- The cable corridor is typically 2km in width, with a wider section of up to 4.7km where there is a dog-leg in the corridor within the SAC;
- A total width of approximately 1.35km is required for Norfolk Vanguard and Norfolk Boreas; which includes up to four cables (laid in pairs, i.e. two trenches) for each project, a contingency of 440m (0.4km), an anchor placement zone, and a buffer for potential anchor placement and cable replacement works (GMSL, 2016 unpublished; Plate 5-1); and
- The remaining width of the offshore cable corridor within the SAC is therefore approximately 0.65km to 3.35km plus the built-in contingency of 0.4km, resulting in approximately 1.05km to 3.75km available for micrositing.

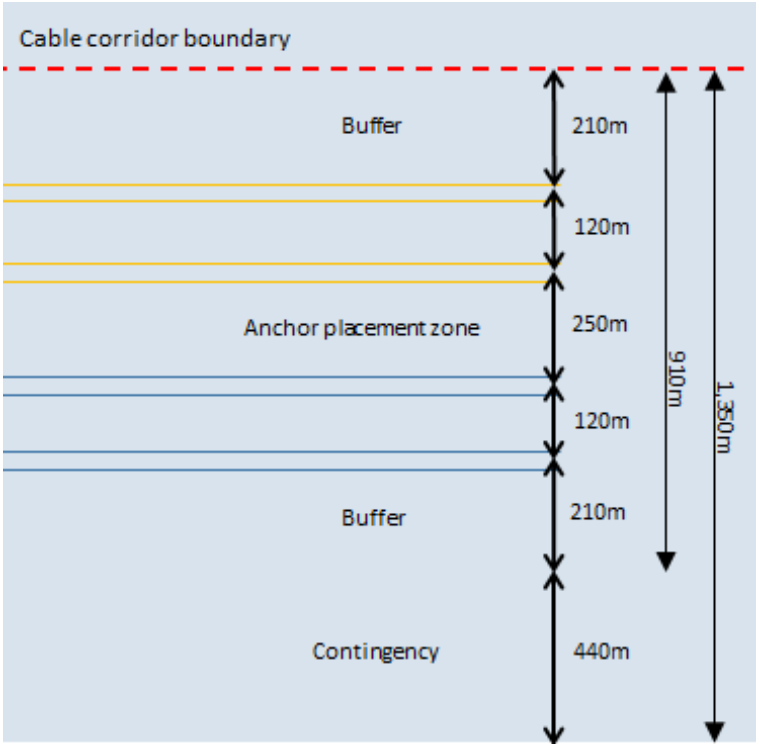

Plate 5-1 Export cables layout (two pairs of cables for Norfolk Vanguard (yellow) and two pairs of cables for Norfolk Boreas (blue)) based on 48m water depth[5]

[4] This SIP is for Norfolk Vanguard alone, however the space available for micrositing within the cable corridor must take account of Norfolk Boreas.

[5] The separation between cables is determined by the potential space required to undertake a cable repair which is a factor of the water depth. Depth in the SAC is less than 48m and therefore this represents a conservative worst case scenario

42. However, should *S. spinulosa* reef colonise the 2km to 4.7km wide offshore cable corridor to such an extent that micrositing is not possible, and in the unlikely event that cable protection would be required in these areas, the habitat loss would be of *de minimis* proportions in relation to a new large expanse of reef bisecting the cable corridor. Such a reef extent would have grown significantly compared with the current extent and would be significantly larger than the Annex 1 Reef that the HHW SAC was designated for, therefore any small scale loss would be within the natural variation of this ephemeral species. This would therefore not impact NE management measures and would not hinder the conservation objectives for the HHW SAC in relation to Annex I reef.

43. As a worst case, total habitat loss within the HHW SAC could be 32,000m^2 (0.03km^2), as discussed in Section 3.3. This represents 0.002% of the 1468km^2 SAC area, however as explained above there will be 0% loss of habitat in the priority areas to be managed as reef.

5.1.4 Effect on structure, function and supporting processes

44. As there will be no habitat loss of *S. spinulosa* Annex I reef from the areas to be managed as reef, there will be no adverse effect on the structure, functioning, supporting processes or feature condition of the *S. spinulosa* Annex I reef as a result of the deployment of cable protection. Furthermore, as demonstrated in Section 5.1.1 the management measures being proposed by NE will not be impacted and the following targets for achieving the conservation objectives of *S. spinulosa* Annex I reef will not be hindered:

- No significant decline in community with different growth phases present
- No decline in the abundance of specified species from an established baseline
- Maintain age/size class structure of individual species.

5.1.5 Existing habitat loss

45. Annex I Reef in the HHW SAC is in unfavourable condition due to various existing pressures on the site, for example fishing, aggregate dredging and existing cables and pipelines which have all been permitted or unmanaged in the site to date. This unfavourable condition and the target to restore the site has been taken into account in the assessment.

46. The in-combination effect of Norfolk Vanguard and Norfolk Boreas cable protection is considered below.

5.1.6 In-combination habitat with Norfolk Boreas

47. Total habitat loss associated with cable protection for Norfolk Vanguard and Norfolk Boreas within the HHW SAC could be up to 64,000m^2 (0.064km^2) based on the following:

- 24,000m^2 as a result of up to six crossings for each of the export cable pairs (12 crossings in total) within the HHW SAC. Each crossing could require up to 100m length and 10m width of protection.
  - It is noted that every effort will be made by the Applicant and Norfolk Boreas Limited to reduce the number of crossings by removing disused cables where agreement can be reached with the cable owners.
  - Where cable protection is required due to pipeline / cable crossings this is not considered Annex I reef, in accordance with NE advice.
- 40,000m^2 as a result of up to 5% of the cable length in the SAC (2km of cable protection per cable pair, 4km in total) potentially requiring cable protection in the unlikely event that unsuitable ground conditions are encountered. A 5m width of cable protection could be required. If required for Norfolk Vanguard and/or Norfolk Boreas, this would only be deployed outside the priority areas to be managed as reef in the HHW SAC.

48. As for Norfolk Vanguard, Norfolk Boreas will also incorporate the new additional mitigation with regards to committing to no cable protection in the priority areas to be managed as reef, therefore any loss would not prevent restoration in accordance with the conservation objectives for *S. spinulosa* Annex I reef within HWW SAC.

49. As with Norfolk Vanguard alone, micrositing will be undertaken for Norfolk Boreas to avoid Annex I *S. spinulosa* reef where at all possible and therefore it is highly unlikely that there would be any cable protection on areas of Annex I reef and therefore there will be no loss of existing reef.

50. The worst case scenario for cable protection for Norfolk Vanguard and Norfolk Boreas represents 0.004% of the 1468km^2 SAC area, however as explained above there will be 0% loss of habitat in the priority areas to be managed as reef.

5.2 Long term loss of Annex I Sandbank

5.2.1 Location of loss of Annex I Sandbank

51. As discussed in Section 5.1, there will be no loss of an Annex I priority natural habitat as a result of cable protection as there are no priority natural habitats in the HHW SAC.

52. The potential location of habitat loss due to the cable protection required within HHW SAC is indicated in Figure 3, showing that the cable protection is likely to be outside NE's identified areas to be managed as Annex 1 Sandbanks.

5.2.2 Duration of habitat loss

53. The duration of habitat loss is expected to be approximately 30 years in line with the expected design life of the project.

5.2.3 Scale of habitat loss

54. Total habitat loss within the HHW SAC could be 32,000m^2 (0.03km^2) as discussed in Section 3.3. This represents 0.002% of the 1468km^2 SAC area and 0.003% of the 678km^2 area of sandbanks within the SAC. This extent of loss is *de minimis,* taking into account the absence of effect on the function of the Annex I Sandbank (discussed in Section 5.2.4). This is in keeping with various case studies, for example (Natural England, 2016):

- Walney Extension - habitat loss of intertidal mudflats and sand flats due to cable installation and rock armour. 0.41% of overall 600ha of feature was affected and the Appropriate Assessment concluded no AEoI.
- Hinkley Point C - habitat loss of a small area of potential *Sabellaria* reef within the rock armour barge berthing and unloading area. This area equated to less than 0.05% of the SAC reef feature and was not considered significant.
- Kentish Flats Extension - habitat loss of 0.003% of Special Protection Area (SPA). The Secretary of State (SoS) and NE agreed this loss to be negligible.

55. It is noted that NE has previously made reference to the Sweetman case study, however the Applicant notes that this refers to permanent loss of priority natural habitat, which is not applicable in the HHW SAC.

5.2.4 Effect on structure, function and supporting processes

56. It is expected that the cable protection may undergo some periodic burial and uncovering during the life of the project. As the natural processes of the mobile Sandbanks would continue, there would be no effect on the low diversity communities associated with this feature.

57. Due to the small scale of cable protection, with a height of approximately 50cm in the context of sand wave heights of approximately 5m, the natural patterns of erosion, accretion and movement of sand waves will not be restricted by the deployment of cable protection in areas of unsuitable burial conditions (if applicable).

5.2.5 Existing habitat loss

58. Annex I Sandbank in the HHW SAC is in unfavourable condition due to various existing pressures on the site, for example fishing, aggregate dredging and existing cables and pipelines which have all been permitted or unmanaged in the site to date. This unfavourable condition and the target to restore the site has been taken into account in the assessment.

59. The in-combination effect of Norfolk Vanguard and Norfolk Boreas cable protection is considered below.

5.2.6 In-combination habitat with Norfolk Boreas

60. There is potential for long term habitat loss to Annex I Sandbanks in the shared Norfolk Vanguard and Norfolk Boreas offshore cable corridor due to the presence of cable protection. The worst case total area of cable protection installed within the HHW SAC could be up to 64,000m^2 (0.064km^2) for both Norfolk Vanguard and Norfolk Boreas based on the following:

- 24,000m^2 as a result of up to six crossings for each of the export cable pairs (12 crossings in total) within the HHW SAC. Each crossing could require up to 100m length and 10m width of protection.
  - Every effort is being made by the Applicant to reduce the number of crossings by removing disused cables where agreement can be reached with the cable owners. An out of service cable recovery agreement has been discussed with BT Subsea. Appendix 4 (document reference ExA; Mit; 11.D10.2.App4) demonstrates the advanced stages of these discussions.
  - Cable protection at crossings would be left *in situ* at the end of the project life, however as noted above this cannot be Annex I reef, in accordance with NE advice that *S. spinulosa* reef growing on artificial substrate is not Annex I reef.
- 40,000m^2 as a result of up to 5% of the cable length in the SAC (2km of cable protection per cable pair, 4km in total) potentially requiring cable protection in the unlikely event that unsuitable ground conditions are encountered. A 5m width of cable protection could be required.
  - This would only be deployed outside the priority areas to be managed as reef in the HHW SAC, unless otherwise agreed with the MMO in consultation with NE.
  - This would be decommissioned and therefore a long term (not permanent) impact.

61. This represents 0.004% of the 1468km^2 SAC area and 0.09% of the 678km^2 area of sandbanks within the SAC.

62. This extent of loss is *de minimis,* taking into account the absence of effect on the function of the Annex I Sandbank (discussed in Section 5.2.4). This is in keeping with the case studies discussed in Section 5.2.3.

6 CONCLUSION

63. The Applicant is proposing a new commitment to use no cable protection in the priority areas to be managed as *S. spinulosa* Annex I reef within the HHW SAC, unless otherwise agreed with the MMO in consultation with NE. This commitment ensures that the proposed management measures for the site will not be impacted and the targets for achieving the conservation objectives of *S. spinulosa* Annex I reef will not be hindered.

64. The Applicant is proposing a new commitment to decommission cable protection at the end of the Norfolk Vanguard project life where it is associated with unburied cables due to ground conditions (where required for crossings this will be left *in situ)*. This commitment ensures that there will be no permanent habitat loss as a result of cable protection.

65. The assessment of habitat loss on the HHW SAC, taking into account this new additional mitigation, demonstrates that any small scale long term loss of habitat within the SAC would not affect the form and function of the Annex 1 Reef and Annex 1 Sandbanks.

66. In addition, the small proportion of cable protection proposed would be of *de minimis* scale, in accordance with existing case studies.

67. Waddenzee case law (C-127/02) states that a project which is not likely to undermine the site's nature conservation objectives cannot be considered to have an adverse effect on site integrity.

68. In addition, Natural England advised in their advice note regarding consideration of small scale habitat loss within SACs in relation to cable protection (submitted at Deadline 4, REP4-062) that it would consider there to be no likelihood of an AEoI where any one (or more) of the following can be demonstrated:

- That the loss is not on the priority habitat/feature/sub feature/supporting habitat, and/or
- That the loss is temporary and reversible, and/or
- That the scale of loss is so small as to be de minimis and/or
- That the scale of loss is inconsequential including other impacts on the site/feature/sub feature.

69. The Applicant considers that all of the above are met in the case of Norfolk Vanguard.

70. Based on the outcome of the assessment it is determined there will be **no AEoI of the HHW SAC in relation to the conservation objectives for *S. spinulosa* Annex I reef and Annex 1 Sandbank due to long term habitat loss as a result of cable protection.**

7 REFERENCES

JNCC and Natural England (2013). Haisborough, Hammond and Winterton candidate Special Area of Conservation: Formal advice under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010 (as amended), and Regulation 18 of The Offshore Marine Conservation Regulations (Natural Habitats, &c.) Regulations 2007 (as amended). [Version 6.0 March 2013]. JNCC, Peterborough.

Natural England (2016). Small-scale effects: How the scale of effects has been considered in respect of plans and projects affecting European sites - a review of authoritative decisions. Natural England Commissioned Report NECR205