FIVE ESTUARIES OFFSHORE WIND FARM

10.30 OUTLINE SEDIMENT DISPOSAL MANAGEMENT PLAN (~~CLEAN~~TRACKED)

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C	Mar-25	Deadline 7	VE OWF	VE OWF	VEOWF
D	Mar-25	Deadline 8a	VE OWF	VE OWF	VE OWF

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DEFINITION OF ACRONYMS

Term	Definition
VE	Five Estuaries Offshore Wind Farm
MDS	Maximum Design Scenario
ES	Environmental Statement
IPMP	In-Principle Monitoring Plan
DWR	Deep Water Route
ECC	Export Cable Corridor
M&LS SAC	Margate and Long Sands Special Area of Conservation
NSIP	Nationally Significant Infrastructure Project
MW	Megawatt
Outline SDMP	Outline Sediment Disposal Management Plan
SDMP	Sediment Disposal Management Plan
UROTV	Utility Remotely Operated Vehicle

1. BACKGROUND

1.1.1 Five Estuaries Offshore Wind Farm Limited (the Applicant) has submitted an application to the Planning Inspectorate on behalf of the Secretary of State, for a Development Consent Order for the Five Estuaries Offshore Wind Farm (herein referred to as VE) under section 37 of the Planning Act 2008.

1.1.2 VE is the proposed extension to the operational Galloper Offshore Wind Farm located 37 km off the coast of Suffolk at its nearest point, comprising of both offshore and onshore infrastructure. The onshore connection works are located within the administrative area of Tendring District Council, within Essex County Council. VE will have an overall capacity of greater than 100 Megawatts (MW) and therefore constitutes a Nationally Significant Infrastructure Project (NSIP) under the Section 15 (3) of the Planning Act 2008.

1.1.3 VE will include both offshore and onshore infrastructure, including an offshore generating station in an area of 128 km^2 (divided in two areas of 67 km^2 and 61 km^2 or the northern array area and southern array area respectively), export cables to landfall (maximum length of 196 km), and connection to electricity transmission network (please see Volume 6, Part 2, Chapter 1: Offshore Project Description [APP-069] for full details of the Project Design).

1.1.4 This Outline Sediment Disposal Management Plan (Outline SDMP) is being submitted to The Planning Inspectorate at Deadline 4 in response to relevant representations and stakeholder discussions in relation to dredge and disposal material within the Array and Export Cable Corridor (ECC). This Outline SDMP sets out the key constraints and measures proposed that will be in included in the final Sediment Disposal Management Plan (SDMP) which will be subject to approval by the MMO.

1.2 PURPOSE AND SCOPE OF DOCUMENT

1.2.1 This Outline SDMP has been developed to set out the proposed plan and management for disposal of seabed and sub-bottom geological material that may arise during the construction of the offshore elements of VE.

1.2.2 For the avoidance of doubt this Outline SDMP relates to the construction of the offshore elements of VE only (i.e Array sites and ECC to landfall).

1.2.3 Details on the physical characteristics of the seabed and subsurface material across the offshore project area are presented within Volume 6, Part 2, Chapter 2 Marine Geology, Oceanography and Physical Processes [APP-071] and within Volume 9, Report 8 Disposal Site Characterisation Report [APP-238].

1.2.4 Although not sediment disposal, consideration is given to the repositioning of boulders that may need to be moved by grab or other means in Section 3.8.

2. DISPOSAL ACTIVITIES

2.1.1 During the construction of VE there will be a requirement to dispose of seabed and sub-bottom geological material that is generated. This disposal activity will involve the deposit of inert, native sedimentary material originating from the following activities associated with the construction of VE but not limited to:

- Construction drilling;
- Seabed preparation for foundation works;
- Cable installation preparation; and
- Excavation of horizontal directional drilling (HDD) exit pits.

2.1.2 Under the deemed Marine Licence, draft Development Consent Order (dDCO) Schedules 10 and 11, Part 1, 2(a)disposal sites have been identified for VE based on the site characterisation undertaken as part of the Environmental Statement (ES) 9.8 Dredge Disposal Site Characterisation Report [APP-238].

2.2 FIVE ESTURIES OFFSHORE WIND FARM ARRAY DISPOSAL SITE

2.2.1 The Maximum Design Scenario (MDS) volumes of material to be disposed in the Array Area from seabed preparation for foundation works, pile drilling and cable installation preparation are summarised in Table 2.1. The MDS has been based on the seabed preparation require for Gravity Base Structures (GBS) as a worst case. It should be noted that GBS have been removed from the dDCO and the worst case array disposal will therefore be considerably less than the assessed MDS.

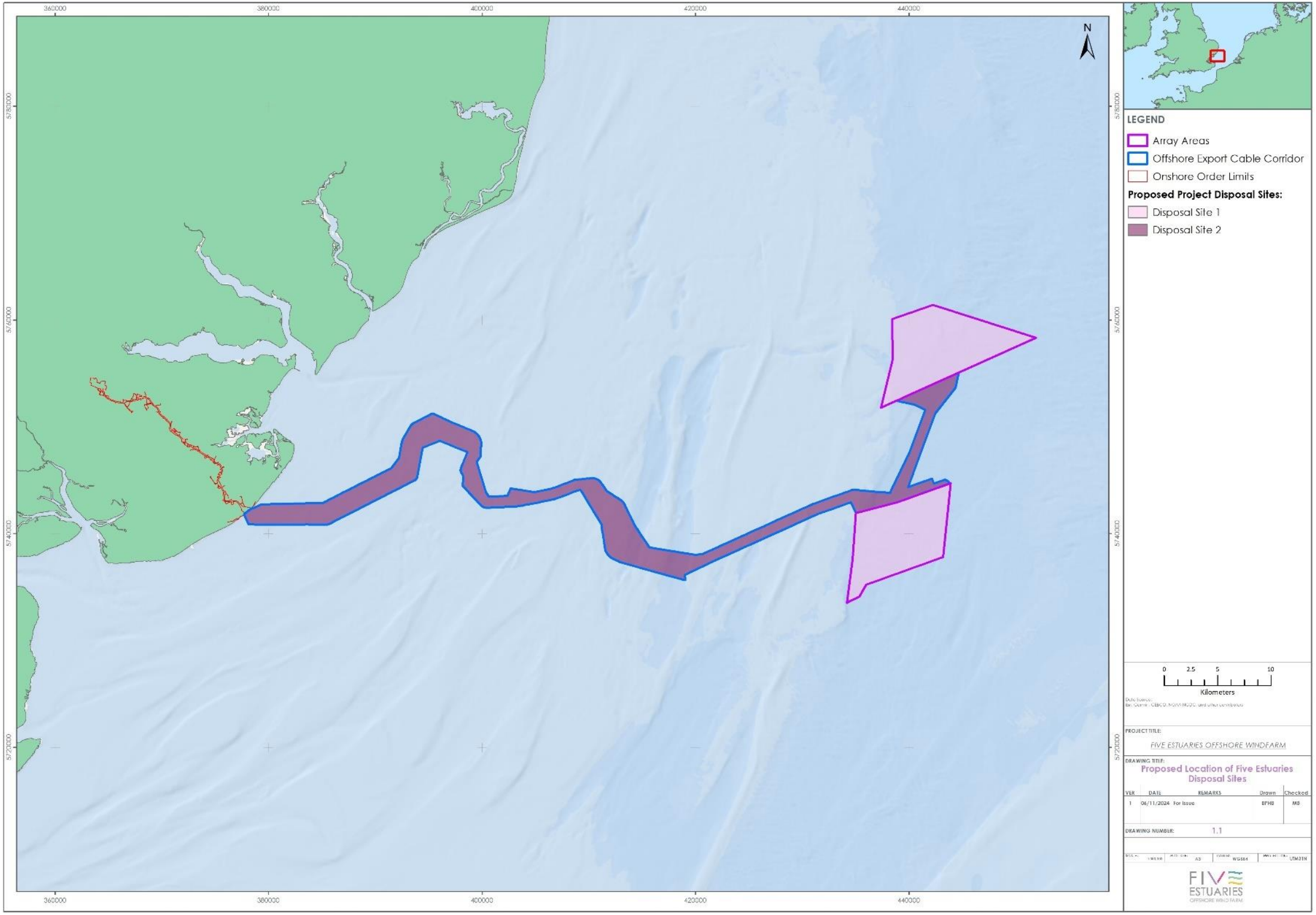
2.2.2 Of note is that it is possible that piled jacket foundations may require seabed preparation as well as drilling. In this case, the total disposal volume for this foundation type will not exceed the total volume for the MDS of seabed preparation for non-piled foundations.

2.3 FIVE ESTUARIES OFFSHORE WIND FARM ECC DISPOSAL SITE

2.3.1 The MDS for the offshore ECC includes sandwave clearance and export cable installation are shown in Table 2.1.

Table 2.1:Maximum Design Scenario for Dredged Material disposal

Parameter	Disposal site 1	Disposal site 2	Total
Project location	**Array Areas**	**Offshore ECC**	**N/A**
Drill arisings (m^3)	567,430	N/A	567,430
Seabed preparation spoil volume for all foundations (m^3)	1,193,600	N/A	1,193,600
Volume from HDD exit pits and vessel laydown areas	N/A	63,225	63,225
Expected maximum volume of material cleared from sandwaves requiring disposal (m^3)	20,613,341 (associated with Array Cables)	6,968,922 (associated with export cables)	29,764,502
	2,182,239 (associated with potential array cables between north and south array areas)		
Total (m^3) – maximum in individual disposal site	22,374,371	9,214,386	31,588,757
Total (km^3) - maximum in individual disposal site	0.025	0.009	0.32


360000
380000
400000
420000
440000
5780000
5760000
5740000
5720000
N
LEGEND
Array Areas
Offshore Export Cable Corridor
Onshore Order Limits
Proposed Project Disposal Sites:
Disposal Site 1
Disposal Site 2
0
2.5
5
10
Kilometers
PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM
DRAWING TITLE:
Proposed Location of Five Estuaries Disposal Sites
VER
DATE
REMARKS
Drawn
Checked
1
06/11/2024
For Issue
BPHB
MB
DRAWING NUMBER:
1.1
A3
WGS84
UTM31N
FIVE ESTUARIES
OFFSHORE WIND FARM

3. SEDIMENT DISPOSAL CONSTRAINTS

3.1.1 The worst-case scenario as presented in Table 2.1 outlines the total volume of material that may require disposal would be up to 31,588,757 m^3, of which up to 22,374,371 m^3 may be disposed of within the Array Area disposal site (northern array and southern array sites, Disposal Site 1) and up to 9,214,386 m^3 in the export cable corridor disposal site (Disposal Site 2) as seen in Figure 2.1.

3.1.2 This disposal of sediment will be distributed across Disposal Site 1 and Disposal Site 2. However, following ES assessments and stakeholder discussions there is a number of constraints that limit the distribution of this material across these disposal sites. It should be noted however, that the maximum volume of material requiring disposal, 31,588,757 m3, will not be exceeded regardless of the distribution scenario.

3.1.3 This section of the Outline SDMP sets out the constraints proposed for implementation by VE during the construction phase following ES assessments carried out and discussions with stakeholders.

3.2 HERRING SPAWNING SEDIMENT DISPOSAL RESTRICTION

3.2.1 Within both Volume 6, Part 5, Annex 6.1: Fish and Shellfish Ecology Technical Baseline Report [APP-121] and Volume 6, Part 2, Chapter 6: Fish and Shellfish Ecology [APP-75], herring (*Clupea harengus*) has been identified as a key receptor, with this species being recognised to have important spawning grounds in the vicinity of VE as well as several species of fish and shellfish are known to either spawn or have nursery areas in relatively close proximity to VE. The nearest herring spawning ground to the VE array areas is the Downs spawning ground which, based on the Coull *et al*. (1998) spawning areas, overlaps the southern array.

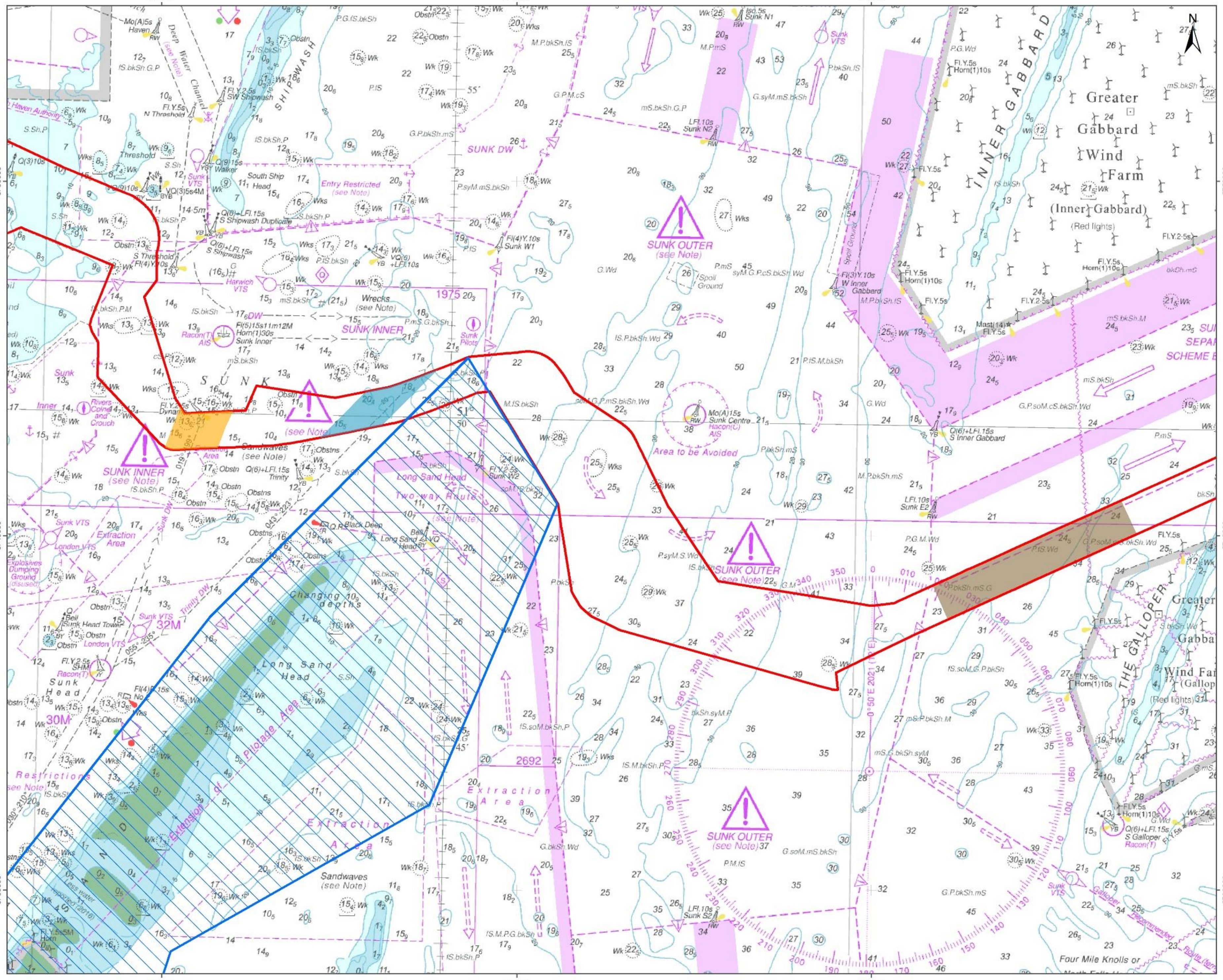
3.2.2 In response to this conclusion the Applicant commits to a sediment disposal restriction whereby and the sediment within the northern array area will not be disposed of within the southern array area to ensure herring spawning substrate characteristics of the southern array area are maintained.

3.3 RESTRICTION ON DISPOSAL WITHIN THE DEEP WATER ROUTES WITHIN THE EXPORT CABLE CORRIDOR

3.3.1 In order to install the export cables within the Export Cable Corridor (ECC) it may be necessary for VE to undertake localised dredging, which will produce material for disposal. Shipping and navigation stakeholders raised concern in relation to this as the disposal sites shown in Figure 2.1 cover the entirety of the ECC and therefore there is concern that inert material would be placed within the ECC which could have implications on the navigable depths at the Deep Water Routes (DWRs) as shown in Figure 3.1.

3.3.2 In response to this concern VE proposes the measure that dredge and drilling disposal material that is created from construction activities will not be disposed of within the DWRs section of the ECC.

3.3.3 Figure 3.1 specifically highlights where these restricted areas are. These areas mirror the area over which VE is committed to dredging to 22 m below Chart Datum to account for future 20 m vessel draught plus 10% under keel clearance.



LEGEND

- Offshore Export Cable Corridor
- Margate and Long Sands Special Area of Conservation
- Sunk Deep Water Route No Disposal Area
- Trinity Deep Water Route No Disposal Area
- Peat and Clay Exposures with Piddocks No Disposal Area

0 1 2 4 Kilometers

Data Source:

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

Sediment Disposal Constraints within the Export Cable Corridor

VER	DATE	REMARKS	Drawn	Checked
1	02/12/2024	For Issue	BPHB	MB

DRAWING NUMBER: 3.1

SCALE: 1:100 000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N

FIVE ESTUARIES OFFSHORE WIND FARM

3.4 AVOIDANCE OF DISPOSAL IN PROXIMITY TO PILOT BOARDING AREA

3.4.1 In line with the measure stated in Section 3.3, there is concern from navigation stakeholders that dredge material created as a result of construction activities would be deposited in the vicinity of the sunk pilot boarding area. The concern specifically relates to there being a reduction in navigable depth should material be disposed of within this area.

3.4.2 The shipping area of interest defined by stakeholders overlaps with the Margate and Long Sands Special Area of Conservation (M&LS SAC) which is a designated area which has it's own objectives (See Section 3.7), that VE is proposing disposal measures for. Therefore, VE commits to avoiding where possible disposing of dredge material within the pilot boarding area subject to the measure in place for M&LS SAC.

3.5 APPROVAL OF CLAY DISPOSAL

3.5.1 To achieve cable burial depths as set out within the Outline Cable Specification and Installation Plan [APP-242] there may be a need to dredge in areas of the ECC, this detail will be added post-consent following further engineering work.

3.5.2 Within the DWRs and Pilot Boarding areas, defined within Figure 3.1, London Clay is present. As set out in Section 3.3 and 3.4 VE has committed to not dispose of material within these DWRs and seeking to not reduce navigable depth within the pilot boarding area through avoiding, where possible, the disposal of material in line with the commitment made in Section 3.4. The clay material produced from this area would therefore need to be disposed within a different section of the ECC or an alternative disposal site (including consideration of using existing and historical disposal sites in the area). To ensure this is disposed in a suitable area, considering the navigational and potential ecological effects of clay disposal, approval of the disposal site(s) for London Clay will be required from the MMO through the final SDMP. Additionally, the final version of the SDMP will include the method of removal, storage, transportation and placement of clay.

3.6 AVOIDANCE OF DISPOSAL IN AREAS WHERE ANNEX I REEF OR SECTION 41 HABITATS ARE PRESENT

3.6.1 Prior to any construction works commencing, geophysical and geotechnical surveys will be carried out to further understand the seabed characteristics. This will help inform engineering design, but will also help identify habitats of importance in relation to benthic ecology as outlined within Report 9.21 Offshore In-Principle Monitoring Plan (IPMP) [REP1-045].

3.6.2 Following these surveys, should there be any identification of potential Annex I reef habitats, further surveys will be undertaken as set out in the Offshore IPMP [REP1-045], which aim to determine if the reef is classified as Annex I reef. These additional surveys may also identify potential Section 41 Natural Environment and Rural Communities (NERC) Act 2006 habitats and species of principle importance.

3.6.3 Currently, and as highlighted within Volume 6, Part 2 Chapter 5, Benthic Ecology [APP-074] there is no record of Annex 1 reef (bedrock reef, stony reef or biogenic reef) present. *Sabelleria spinulosa* is present as small isolated patches, which are not classified as Annex I reef, from within the VE Array or ECC sites from the site specific surveys carried out to date. The Section 41 habitat of "Peat and clay exposures with Piddocks" was found in three sample stations at the eastern end of the ECC (See Figure 5.1 of [APP-120]). Sediment disposal will not be conducted within 50 m of this area identified as "A4.231 – Piddocks with sparce associated fauna in sublittoral very soft chalk or clay", unless further survey work is carried out to determine that this habitat is no longer present. This area is identified within Figure 3.1~~.31~~. Should further areas of "A4.231 – Piddocks with sparce associated fauna in sublittoral very soft chalk or clay" be identified in any pre-construction surveys, these areas will also be avoided by 50 m.

3.6.4 Nevertheless, VE recognises the potential impacts of depositing material onto sensitive habitats, such as Annex I *Sabelleria spinulosa* reef. Therefore, to minimise any potential impacts, should *Sabelleria spinulosa* Annex I reef be identified during ~~post-consent~~pre-construction surveys and/ or areas with other Section 41 habitats and species, the Applicant will ensure dredged material will not be deposited on these areas wherever possible. Should Annex I *Sabelleria spinulosa* reef be identified, sediment disposal will avoid these areas by 50 m.

3.7 DISPOSAL OF DREDGE MATERIAL WITHIN THE MARGATE AND LONG SANDS SPECIAL AREA OF CONSERVATION.

3.7.1 Commitments relating to the disposal of material with the Margate Long Sands SAC are secured in the M&LS SAC – Benthic Mitigation Plan [REP2-020]. The following section sets out these measures for completeness, however it is the Benthic Mitigation Plan itself that should be referred to for the definitive commitments in this area.

3.7.2 As outlined in ES Volume 6, Part 2 Chapter 5, Benthic and Intertidal Ecology [APP-74] and Volume 9, Report 13: M&LS SAC – Benthic Mitigation Plan [REP2-020], VE are unable to avoid the ECC intersecting a small section of the M&LS SAC. This is due to safety concerns raised by Harwich Haven Authority with regards to cable installation in close proximity to the pilot boarding station.

3.7.3 During construction, boulder clearance, debris clearance, UXO clearance and pre-sweeping of mobile sediments may be required to create a suitable seabed surface for cable burial to be achieved and maintained. Volume 6, Part 2, Chapter 2: Marine Geology, Oceanography and Physical Processes [APP-071], and the Outline Cable Burial Risk Assessment (Volume 9, Report 9) [APP-239] indicates that where the ECC crosses the M&LS SAC it is outside of the key areas of sediment mobility, but there are megaripples present in the area which are likely to be affected by a degree of mobility. Should pre-sweeping be required it is likely to be limited to the removal of the megaripple crests to remove any steep gradients caused by them.

3.7.4 Therefore, should pre-sweeping be undertaken the material removed from ML&S SAC will be placed within the offshore ECC, within the M&LS SAC. This will ensure that sediment remains in the same sediment cell (also referred to as the 'same sedimentary system') and therefore no sediment is being removed from the local sediment transport system, only redistributed, thus maintaining the natural sedimentary environment.

USE OF DISCHARGE PIPE FOR DEPOSITING MATERIAL WITHIN M&LS SAC

3.7.5 When depositing sediment that has been removed from M&LS SAC back onto the seabed (within the same sediment cell) within the M&LS SAC, a discharge pipe (or downpipe) will be used where practicable. This will ensure material is released much closer to the seabed, rather than being released at the seas surface, if the hoppers doors were simply opened. This will help minimise the volume of suspended sediment and the area over which the sediment settles, thus minimising any potential smothering.

DISPOSAL OF MATERIAL WITHIN THE VICINITY OF THE M&LS SAC

3.7.6 In line with the measure stated above in Section 3.7, and ensuring that the natural sedimentary environment and sediment supply is maintained within the M&LS SAC, disposal material that is created from construction activities within the vicinity of the MLS SAC, should aim to be disposed within the vicinity of the site, to retain as much of the sediment within the local sediment transport system. However, dredge material from further away from the M&LS SAC will not be disposed in the vicinity of the site, to mimimise smothering impacts. M&LS SAC is shown on Figure 3.1, for further context.

3.7.7 The areas defined as ‘within the vicinity of the M&LS SAC’ are the areas of the Offshore ECC immediately to the east and to the west of the M&LS SAC. The area to the west of the M&LS SAC is the area between the SAC site and the Trinity Deep Water Route No Disposal Area, as shown in Figure 3.1, an area approximately 500 m wide. The area ‘within the vicinity’ to the east of the site is also considered to be a strip that is also approximately 500 m wide, adjacent to the SAC site.

3.8 BOULDERS

3.8.1 Whilst the main purpose of this outline plan is sediment disposal, this section provides details of the outline plan for boulders that may need to be removed from the seabed and deposited a short distance away.

3.8.2 The preliminary surveys indicate that significant boulder fields are not expected on the cable routes. If the detailed engineering changes this then the primary method for addressing surface and near surface boulders is expected to be avoidance through routing. If this is not possible and boulder clearance is required then the following approach is outlined.

3.8.3 Boulders may be cleared using a number of methods, depending on the density of boulders encountered. Where boulders are present in high density and of a suitable size, a boulder clearance tool, for example, SCAR plough or similar may be employed. In areas of low density or if boulders are of a sufficient size, it may be more efficient to use a grab to target and re-locate individual boulders. Typical grab tools may be used such as the Utility Remotely Operated Vehicle (UTROV) tine grab or a clamshell grab. Whilst unlikely, there is the potential that boulders may be removed by the use of a boulder clearance tool and/ or a grab tool at a suitable location as close as possible to the original within the Order Limits.

3.8.4 If boulders are found within the Deep Water ~~Channels~~ Routes ~~and relocating them as close as possible would result in a hazard to the shipping and navigation function of these channels, boulder will be relocated outside of these areas~~these will be relocated outside of these areas to avoid impacts to the navigation of these channels.

3.8.5 ~~The same methodology will be employed both within the M&LS SAC and outside of the SAC.~~If boulders need to be cleared from within the M&LS SAC, a method will be chosen to ensure that the moved boulders do not create a linear feature which may disrupt sediment transportation.

FIVE ESTUARIES
OFFSHORE WIND FARM

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