



Morecambe Offshore Windfarm: Generation Assets Environmental Statement

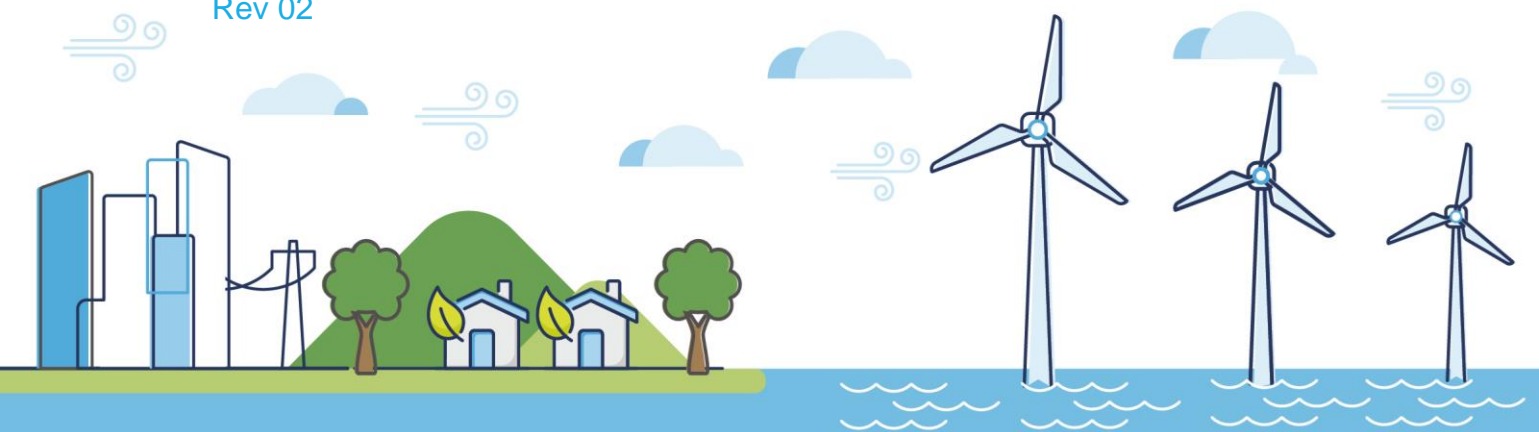
Volume 5

Chapter 7 Marine Geology, Oceanography and Physical Processes Figures

PINS Document Reference: 5.3.7

APFP Regulation: 5(2)(a)

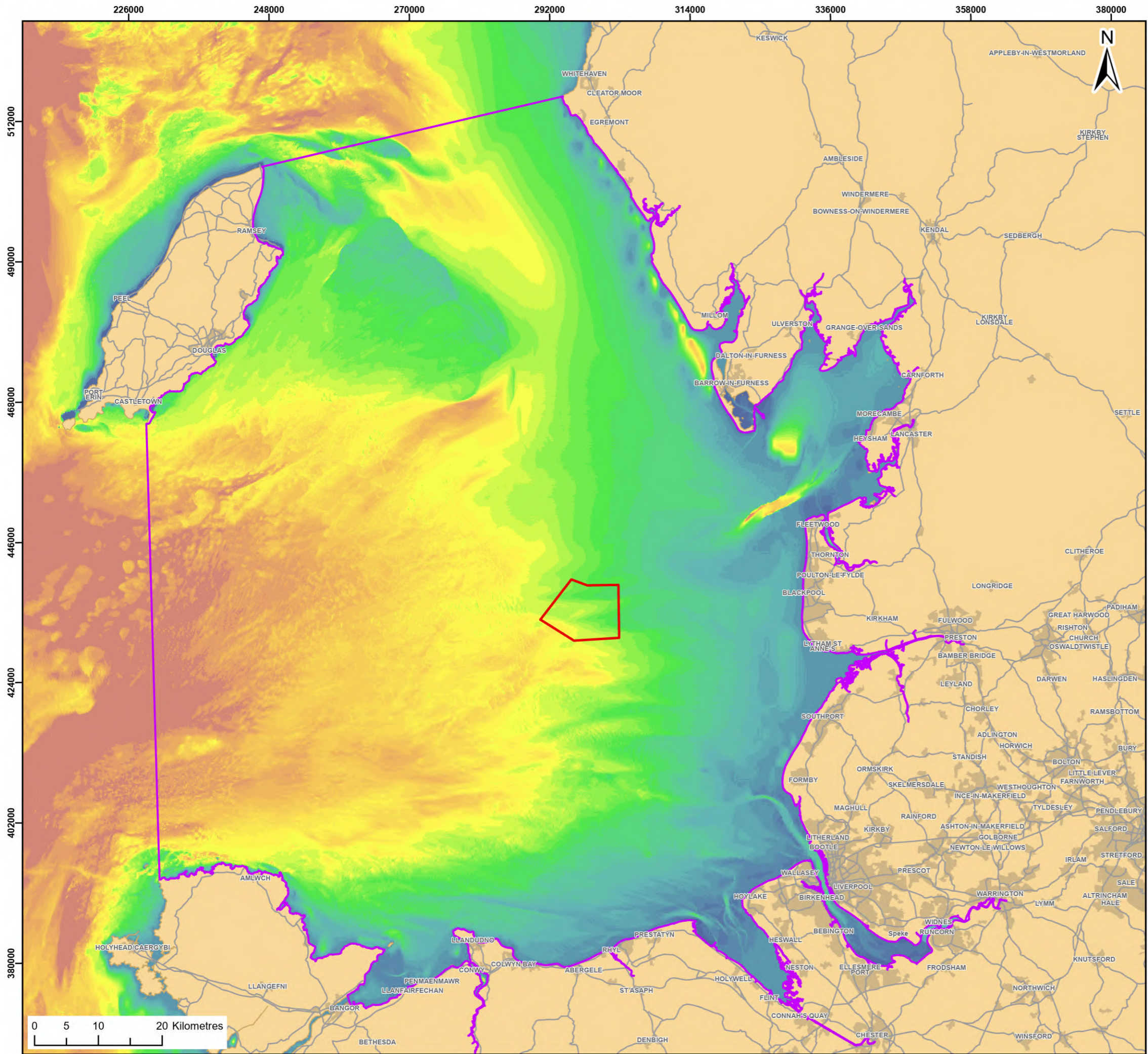
Rev 02



Document History

Doc No	MOR001-FLO-CON-ENV-FIG-1070	Rev	02
Alt Doc No	PC1165-RHD-ES-XX-DG-Z-0007		
Document Status	Approved for Use	Doc Date	July 2024
PINS Doc Ref	5.3.7	APFP Ref	5(2)(a)

Rev	Date	Doc Status	Originator	Reviewer	Approver	Modifications
01	May 2024	Approved for Use	Royal HaskoningDHV	Morecambe Offshore Windfarm Ltd	Morecambe Offshore Windfarm Ltd	n/a
02	July 2024	Approved for Use	Royal HaskoningDHV	Morecambe Offshore Windfarm Ltd	Morecambe Offshore Windfarm Ltd	Addition of bathymetry key on Figure 7.1



Legend:

- Morecambe Offshore Windfarm Site
- Physical Processes Study Area

Depth (m, LAT)

Value	Color
6 - 12	Dark Blue
3 - 6	Blue
0 - 3	Light Blue
-3 - 0	Teal
-6 - -3	Greenish Teal
-9 - -6	Green
-12 - -9	Light Green
-14 - -12	Yellow-Green
-17 - -14	Yellow
-19 - -17	Light Yellow
-22 - -19	Yellow-Orange
-24 - -22	Orange
-27 - -24	Light Orange
-29 - -27	Orange
-31 - -29	Light Orange
-34 - -31	Yellow
-36 - -34	Light Yellow
-38 - -36	Yellow
-40 - -38	Light Orange
-42 - -40	Orange
-44 - -42	Light Orange
-46 - -44	Orange
-49 - -46	Light Orange
-52 - -49	Orange
-58 - -52	Light Orange
-60 - -58	Orange
< -60	Red

© Haskoning DHV UK Ltd, 2024; © EMODnet, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets
Environmental Statement

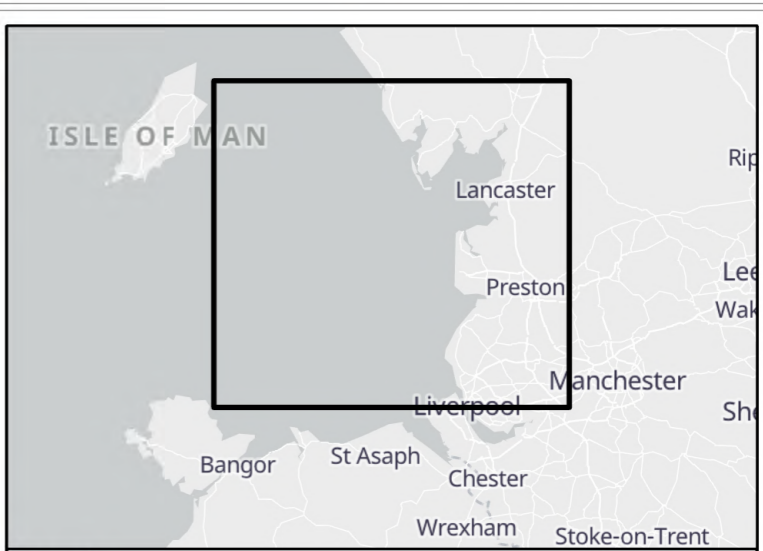
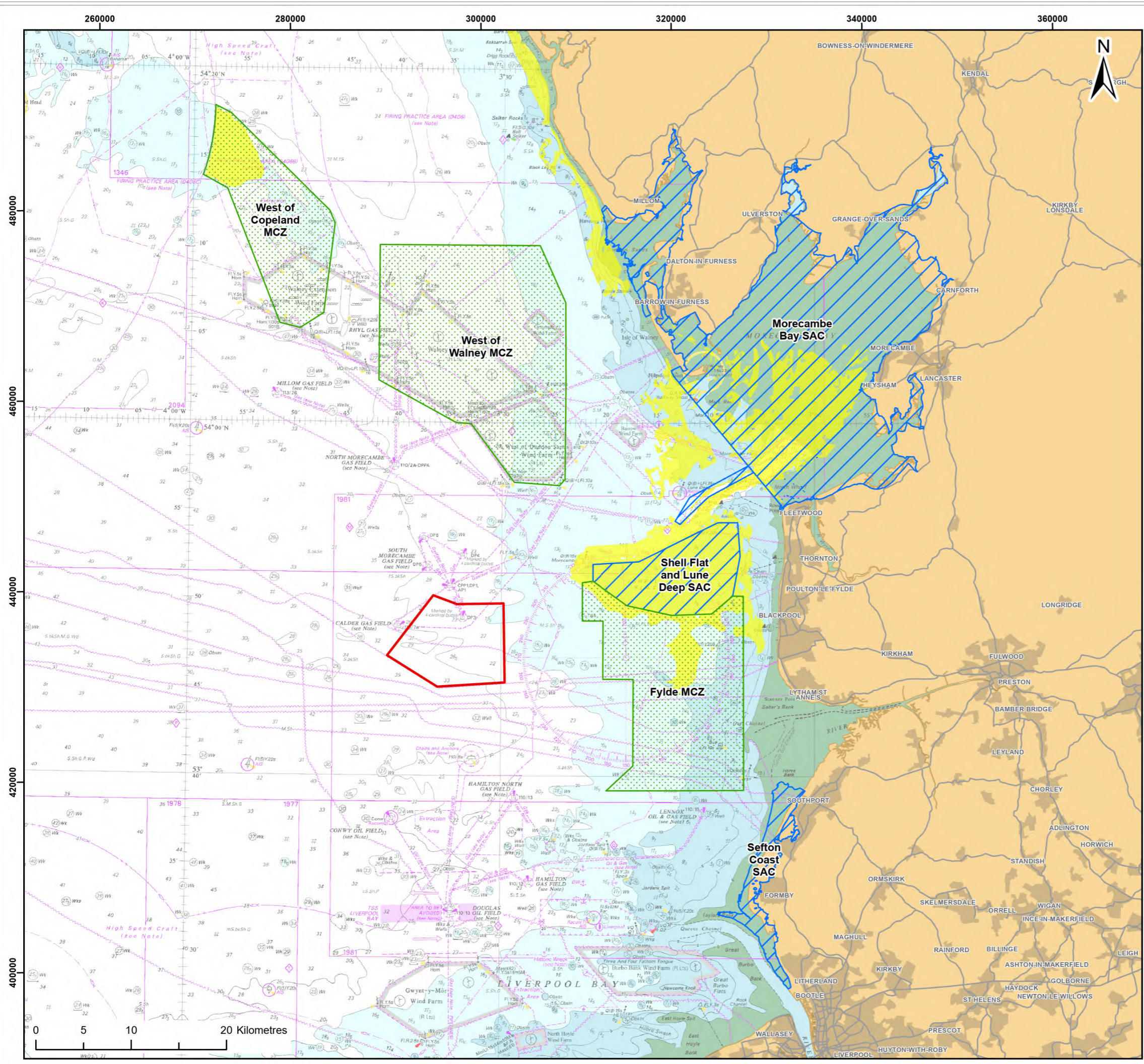
Title:
Study Area and bathymetry at Morecambe
Offshore Windfarm

Figure: 7.1 **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0008

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JH	GC	A3	1:600,000
P02	23/07/2024	SB	GC	A3	1:600,000

Co-ordinate system: WGS 1984 UTM Zone 30N





- Legend:**
- Morecambe Offshore Windfarm Site
 - Special Areas of Conservation (SAC)
 - Marine Conservation Zone (MCZ)
 - Annex I Sandbanks

© JNCC, 2024; © Natural England, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

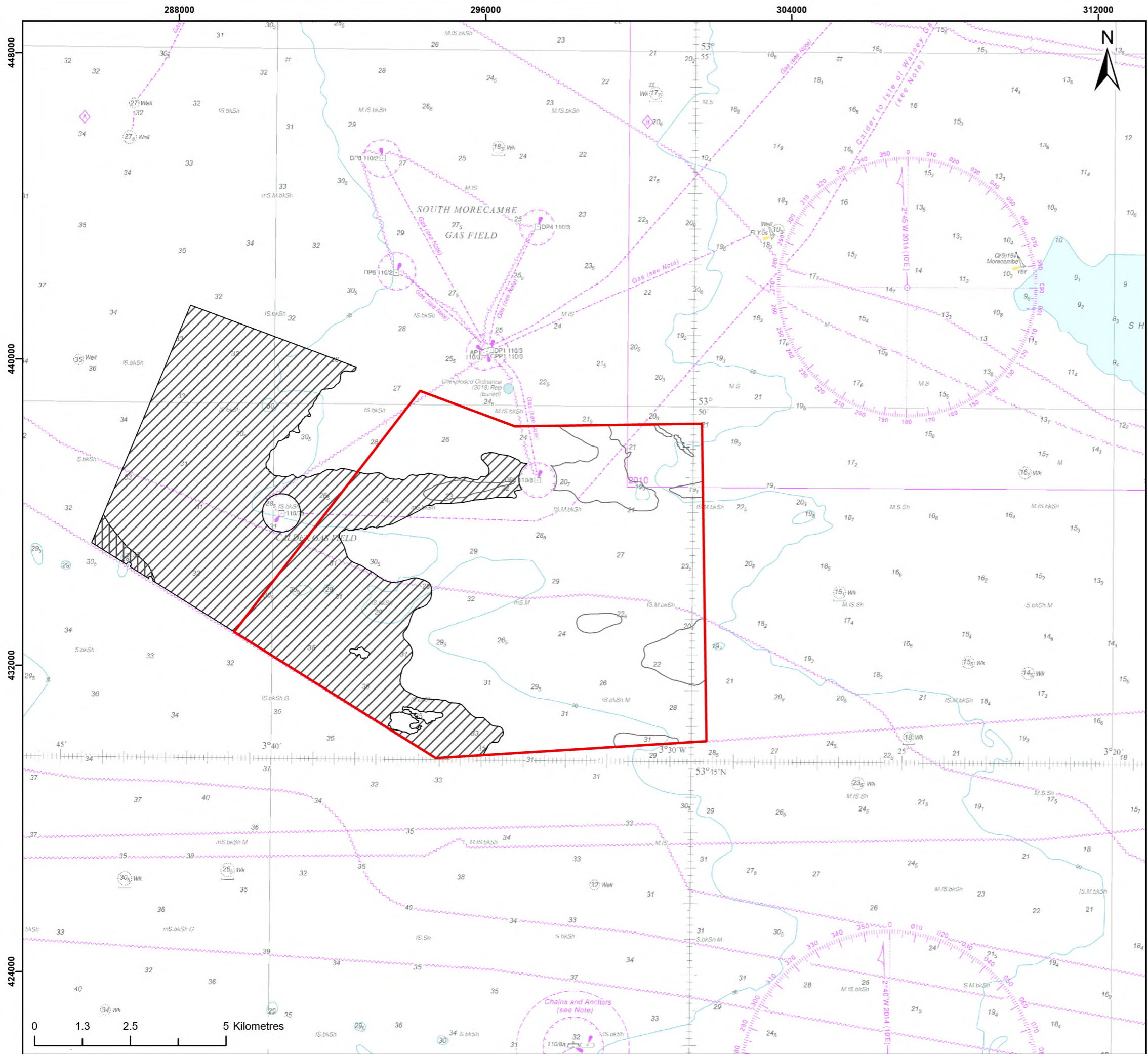
Title:
Impact receptors for Marine Geology, Oceanography and Physical Processes

Figure: 7.2 **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0013

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JT	GC	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N





Legend:

- Morecambe Offshore Windfarm Site
- Current lineation
- Sandwaves
- Megaripples

© MMT, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-801211. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
 Morecambe Offshore Windfarm: Generation Assets
 Environmental Statement

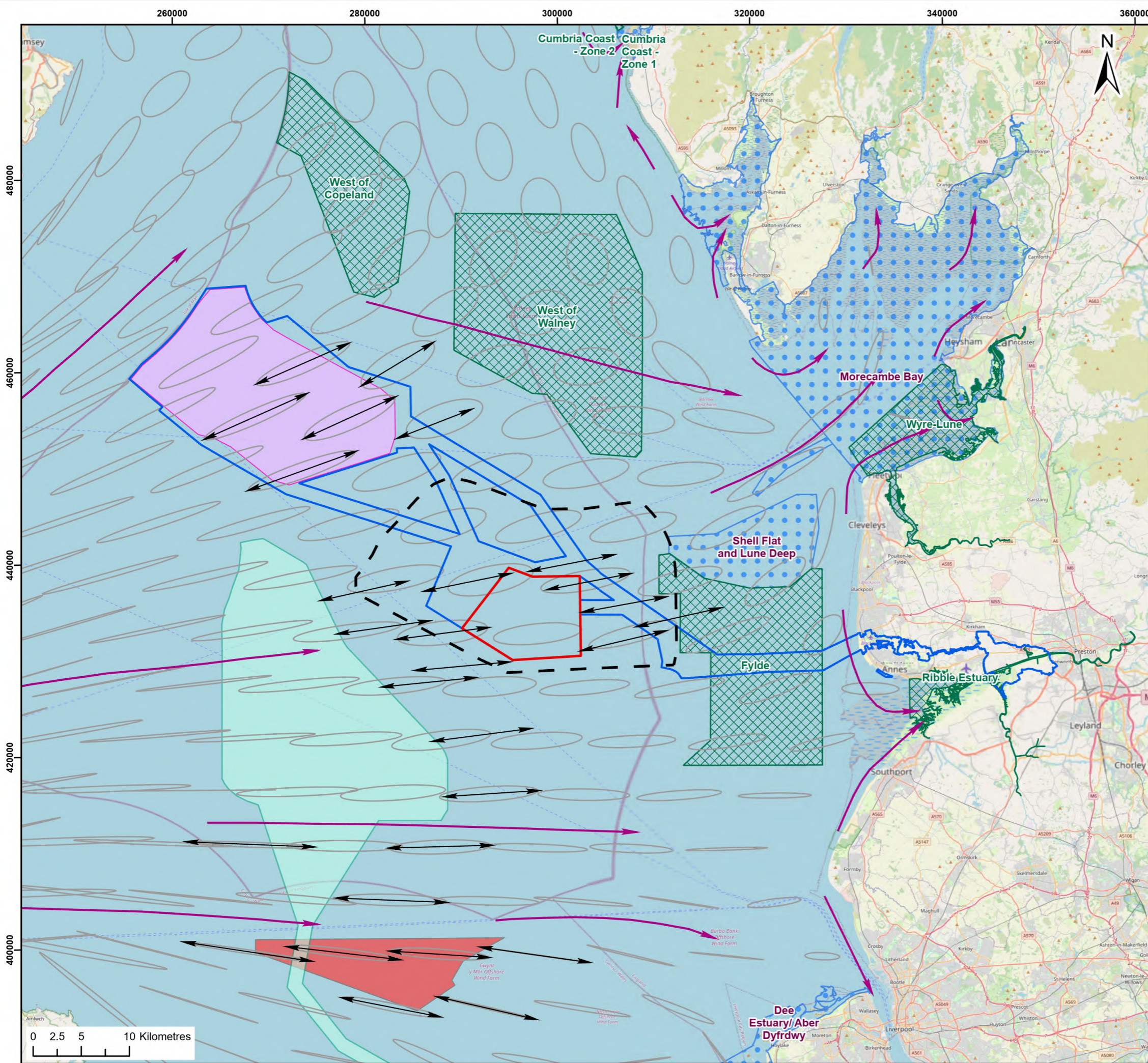
Title:
 Bedforms recorded during the
 geophysical survey (MMT, 2022)

Figure: 7.3 Drawing No: PC1165-RHD-ES-OF-DR-Z-0009

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JT	GC	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N





Legend:

- Morecambe Offshore Windfarm Site
- Morgan and Morecambe Offshore WindFarms: Transmission Assets
- Mona Offshore Wind Project
- Morgan Offshore Wind Project Generation Assets
- Awel y Môr Offshore Wind Farm
- Spring tidal ellipse
- Suspended sediment transport directions
- Sediment transport pathways
- Marine Conservation Zone
- Special Areas of Conservation
- Zone of Influence (ZoI) on the tidal regime

© Haskoning DHV UK Ltd, 2024; © TCE, 2024; © ABPmer, 2024; © Natural England, 2024; © JNCC, 2024; Contains OS data © Crown copyright and database right, 2024; © OpenStreetMap (and) contributors, CC-BY-SA, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

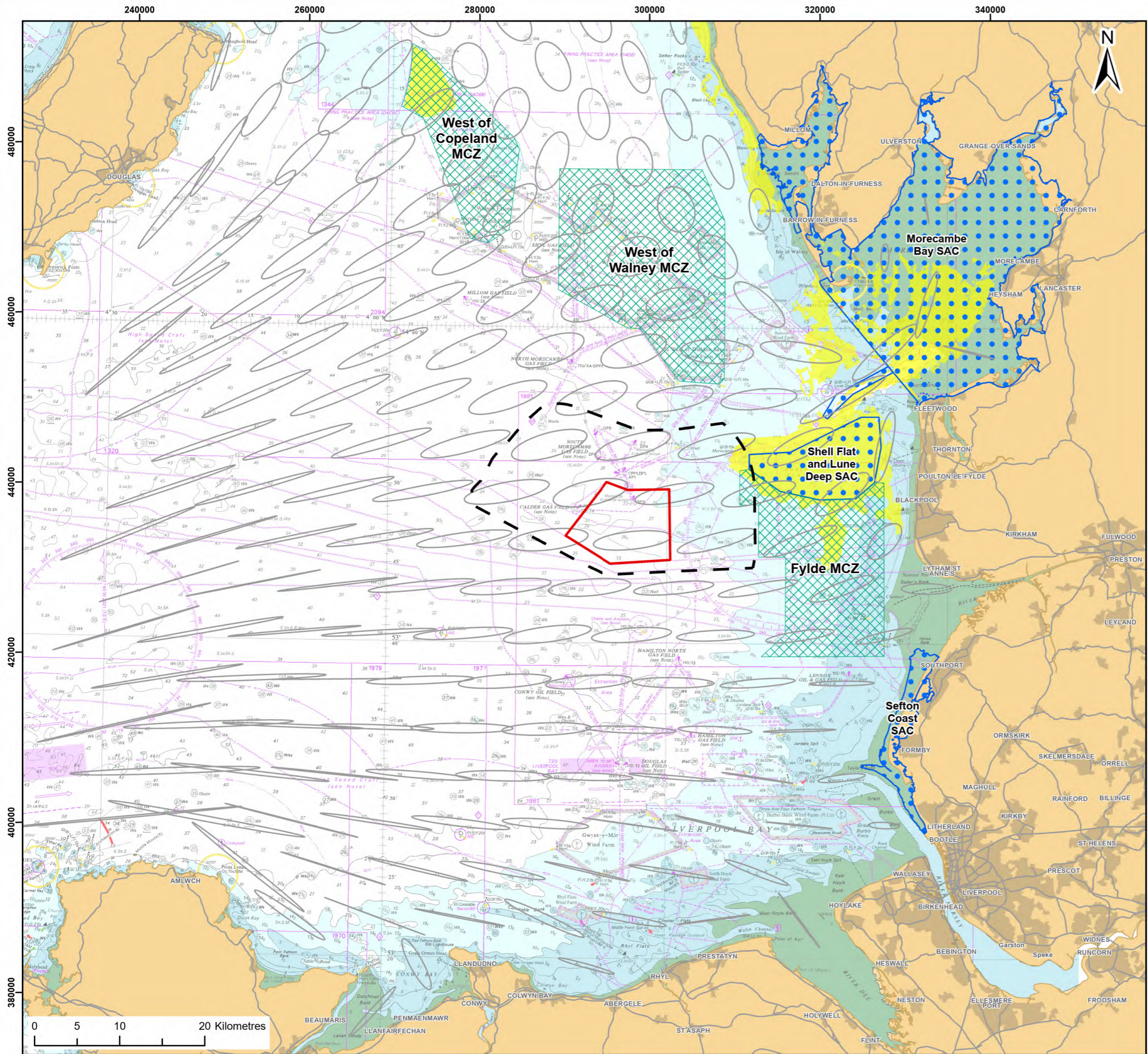
Title:
Conceptual map of sediment transport directions from disturbance activities.

Figure: 7.4 **Drawing No:** PC1165-RHD-ES-OF-DG-Z-0076

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JH	SB	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N





- Legend:**
- Morecambe Offshore Windfarm Site
 - Zone of Influence (ZoI) on the tidal regime
 - Spring tidal ellipses
 - Annex I sandbanks
 - Special Areas of Conservation (SAC)
 - Marine Conservation Zone (MCZ)

© ABPmer, 2024; © JNCC, 2024; © Natural England, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets
Environmental Statement

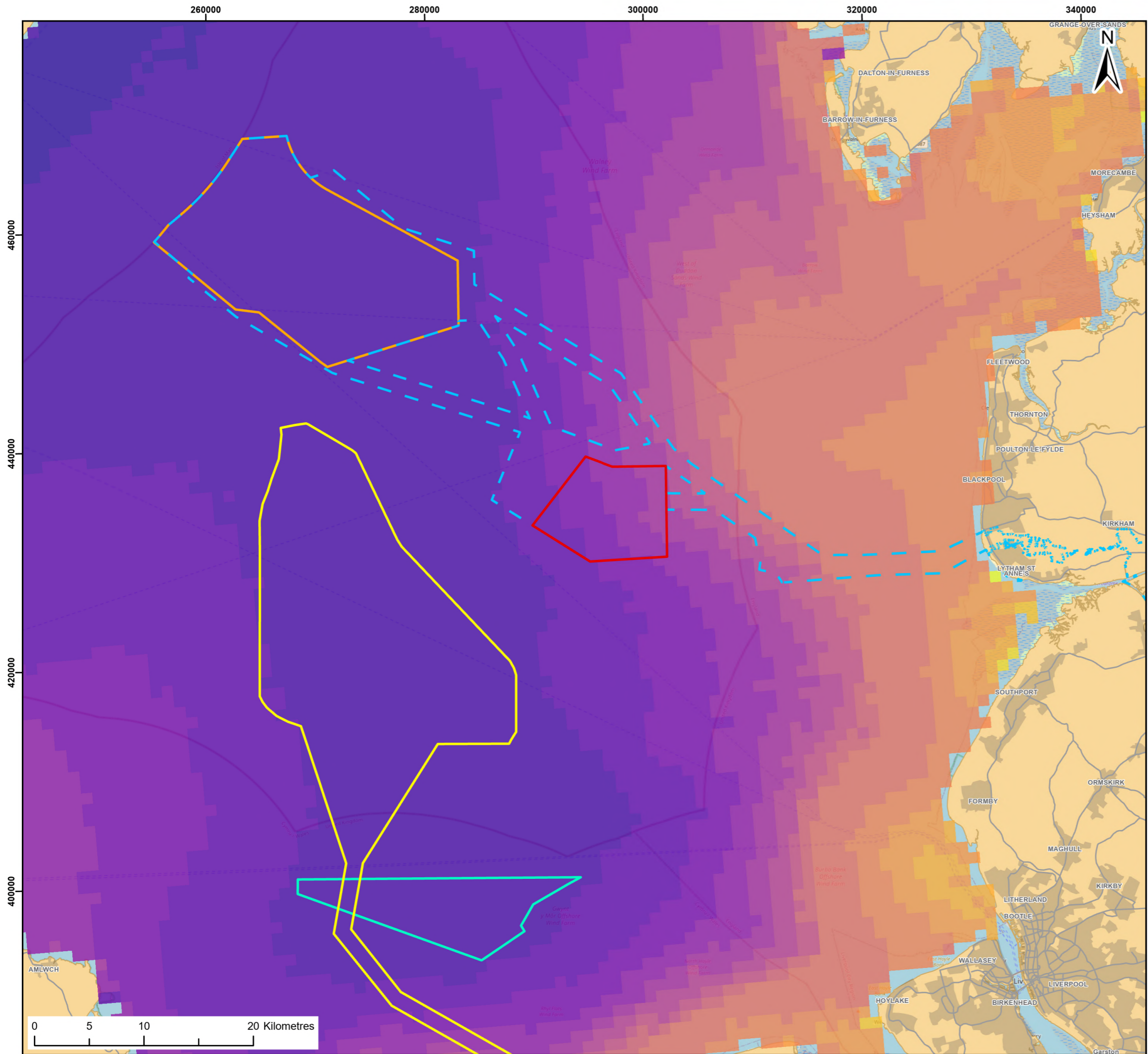
Title:
Zone of potential influence on the tidal regime

Figure: 7.5 **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0014

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JT	GC	A3	1:450,000

Co-ordinate system: WGS 1984 UTM Zone 30N





Legend:

- Morecambe Offshore Windfarm Site
- Morgan Offshore Wind Project Generation Assets
- Morgan & Morecambe Offshore Wind Farms: Transmission Assets
- Mona Offshore Wind Project
- Awel y Môr Offshore Windfarm

Average Suspended Particulate Matter (mg/l) (1998 - 2015)

	< 1		5 - 6		10 - 15
	1 - 2		6 - 7		15 - 20
	2 - 3		7 - 8		20 - 25
	3 - 4		8 - 9		25 - 30
	4 - 5		9 - 10		30 - 35
					35 - 40
					> 45

© Cefas, 2016; © TCE, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024. © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. © OpenStreetMap (and) contributors, CC-BY-SA, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

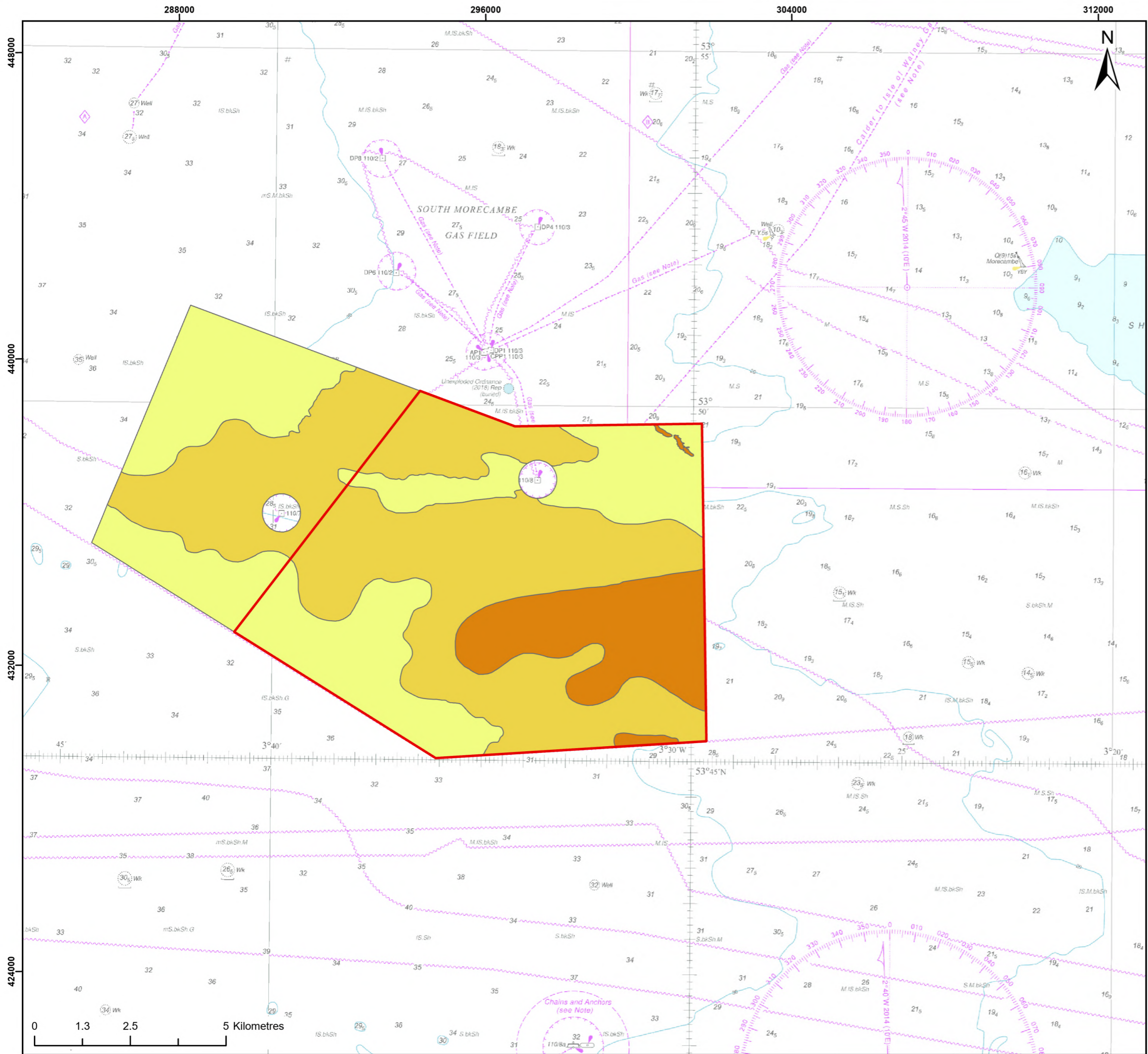
Title:
Suspended sediment concentrations (Cefas, 2016)

Figure: 7.6 **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0012

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JH	SB	A3	1:350,000

Co-ordinate system: WGS 1984 UTM Zone 30N





Legend:

Morecambe Offshore Windfarm Site

Sediment classification

- Sand
- Clayey Sand
- Gravelly Sand

© MMT, 2022; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-801211. Not to be used for Navigation; Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

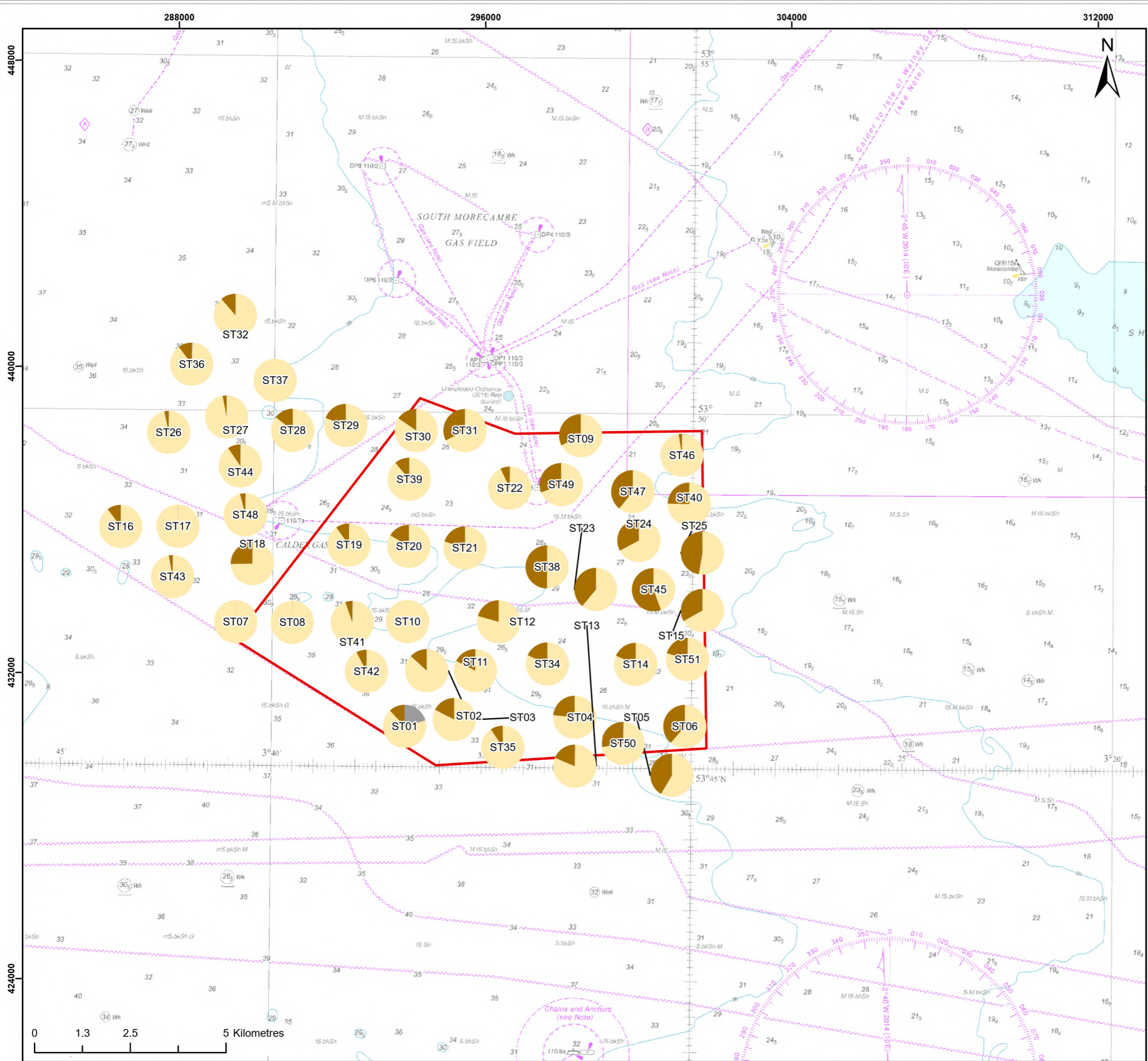
Title:
Site-specific sediment classification (MMT, 2022)

Figure: 7.7 Drawing No: PC1165-RHD-ES-OF-DR-Z-0011

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JT	GC	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N






Legend:

Morecambe Offshore Windfarm Site

Seabed Sediment Sample Locations - Major Sediment Fractions



% Gravel

% Sand

% Mud

© MMT, 2022; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-801211. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

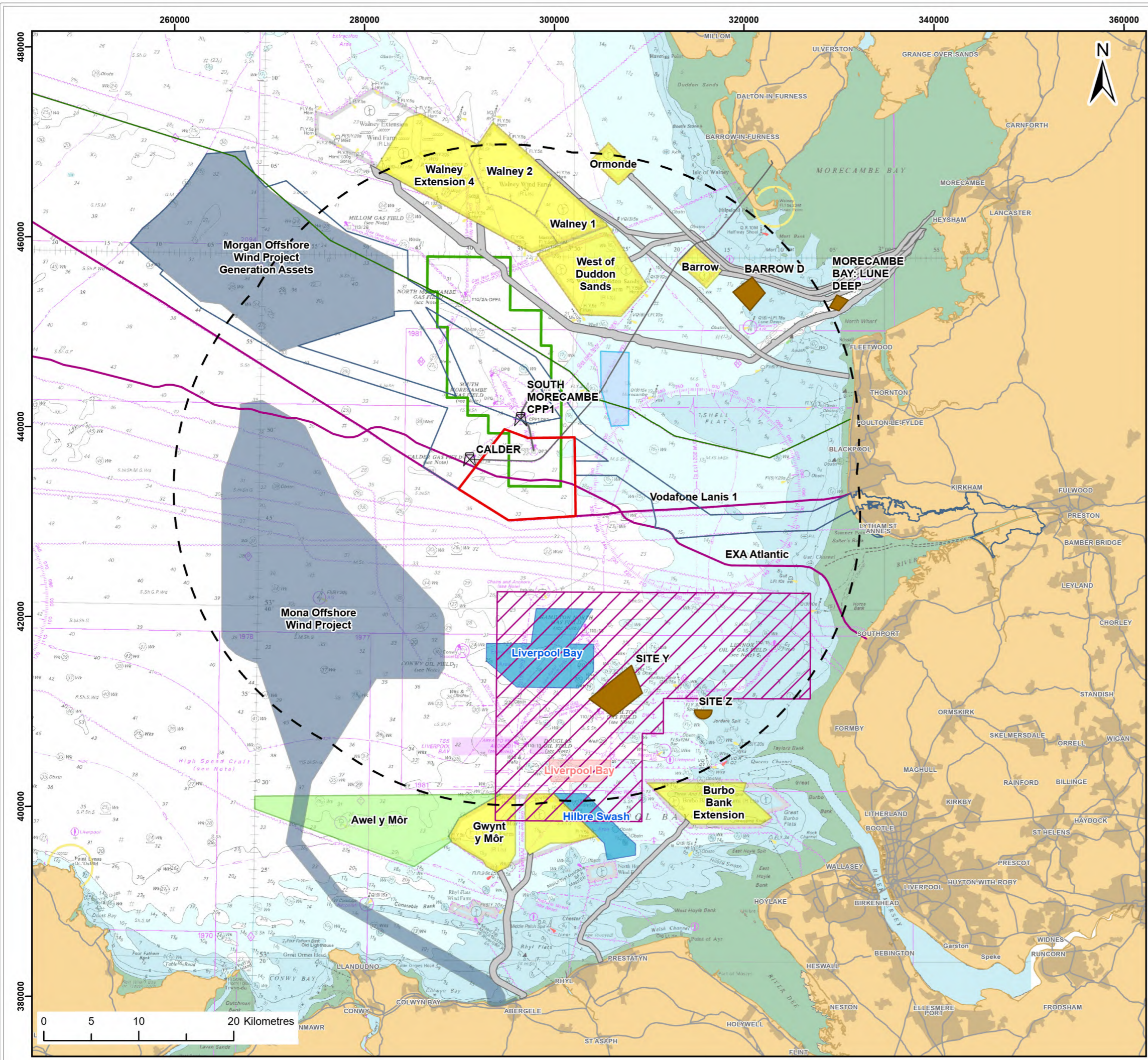
Title:
Site-specific sediment sampling locations (MMT, 2022)

Figure: 7.8 Drawing No: PC1165-RHD-ES-OF-DR-Z-0010

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JT	GC	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N





Legend:

- Morecambe Offshore Windfarm Site
- 30km CEA screening buffer
- Morgan and Morecambe Offshore Wind Farms: Transmission Assets (In Planning)
- Telecom cables
- Isle of Man Interconnector
- Oil & Gas Pipeline
- Disposal Sites
- Gateway Gas Storage Project
- Carbon Capture Storage Licence (CS004)
- Carbon Capture Storage Area (EIS Area 1)
- Offshore Wind Cable Agreements

Windfarm status

- Fully commissioned
- In Planning
- Consented

Minerals & Aggregates Site Agreements

- Exploration and Option Area
- Production Agreement Area

© TCE, 2024; © NSTA, 2024; © CEFAS, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

Title:
Other plans, projects and activities included in the Cumulative Effects Assessment for physical processes

Figure: 7.9 **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0015

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JH	SB	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N

