VATTENFALL

Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex 2-3: Geophysical Investigation Report 2 of 3 - Geophysical Site Survey

June, 2017, Revision A

Document Reference: 6.4.2.3.1

Pursuant to: APFP Reg. 5(2)(a)

Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex 2-3: Geophysical Investigation Report 2 of 3 - Geophysical Site Survey

June, 2018

Drafted By:	Fugro Group
Approved By:	Helen Jameson
Date of Approval	June 2018
Revision	A

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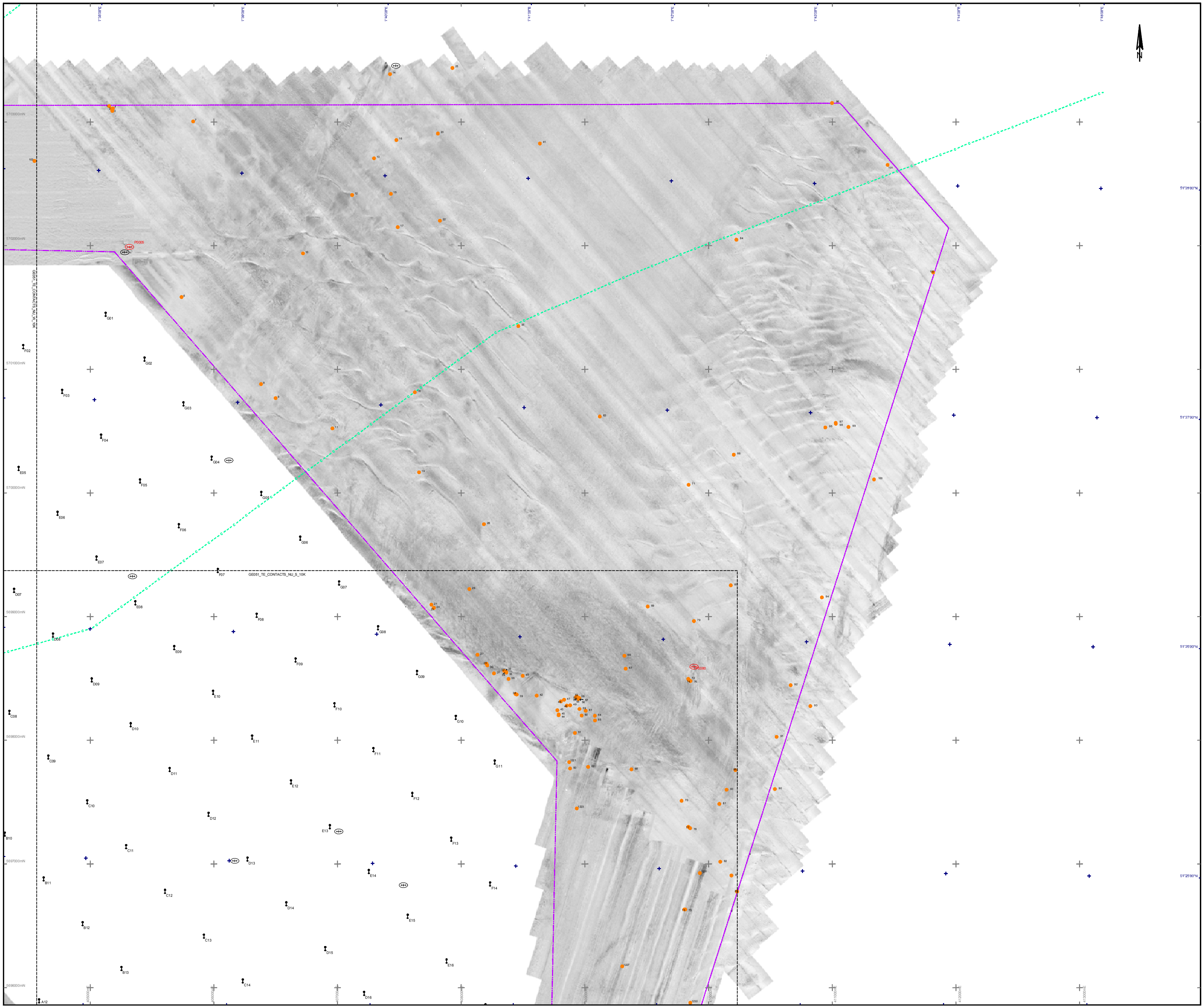

LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
- - -	EXISTING CABLE ROUTES
-·-·-	WIND FARM BOUNDARY (TOW)
-----	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)
P123 ⊕	AS-FOUND WRECK WITH SSS ID NUMBER (PREFIX OMITTED)

SEABED FEATURES

● 12	SIDESCAN SONAR CONTACT WITH REFERENCE NUMBER (PREFIX OMITTED)
10 m	LINEAR DEBRIS WITH LENGTH

SIDESCAN SONAR MOSAIC

▨	SIDESCAN SONAR MOSAIC

NOTES:

1. INTERPRETATION BASED ON EDGETECH 4200-FS DIGITAL SIDESCAN SONAR; KONGSBERG EM2040 DUAL HEAD MBES.
2. IMAGE BASED ON EDGETECH 4200-FS DIGITAL SIDESCAN SONAR.
3. FOR INTERPRETATION AND QC OF THE SIDESCAN SONAR DATA CHESAPEAKE SONARWIZ 6 SOFTWARE WAS USED. THE FEATURES DISCERNABLE ON THE MBES DATA WERE INTERPRETED IN ARCGIS SOFTWARE.
4. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG
	dX=+0.05376 dY=+0.05096 dZ=-0.08847
	rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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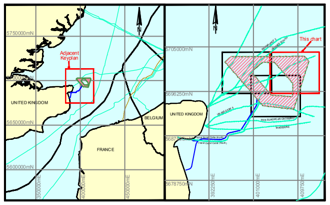

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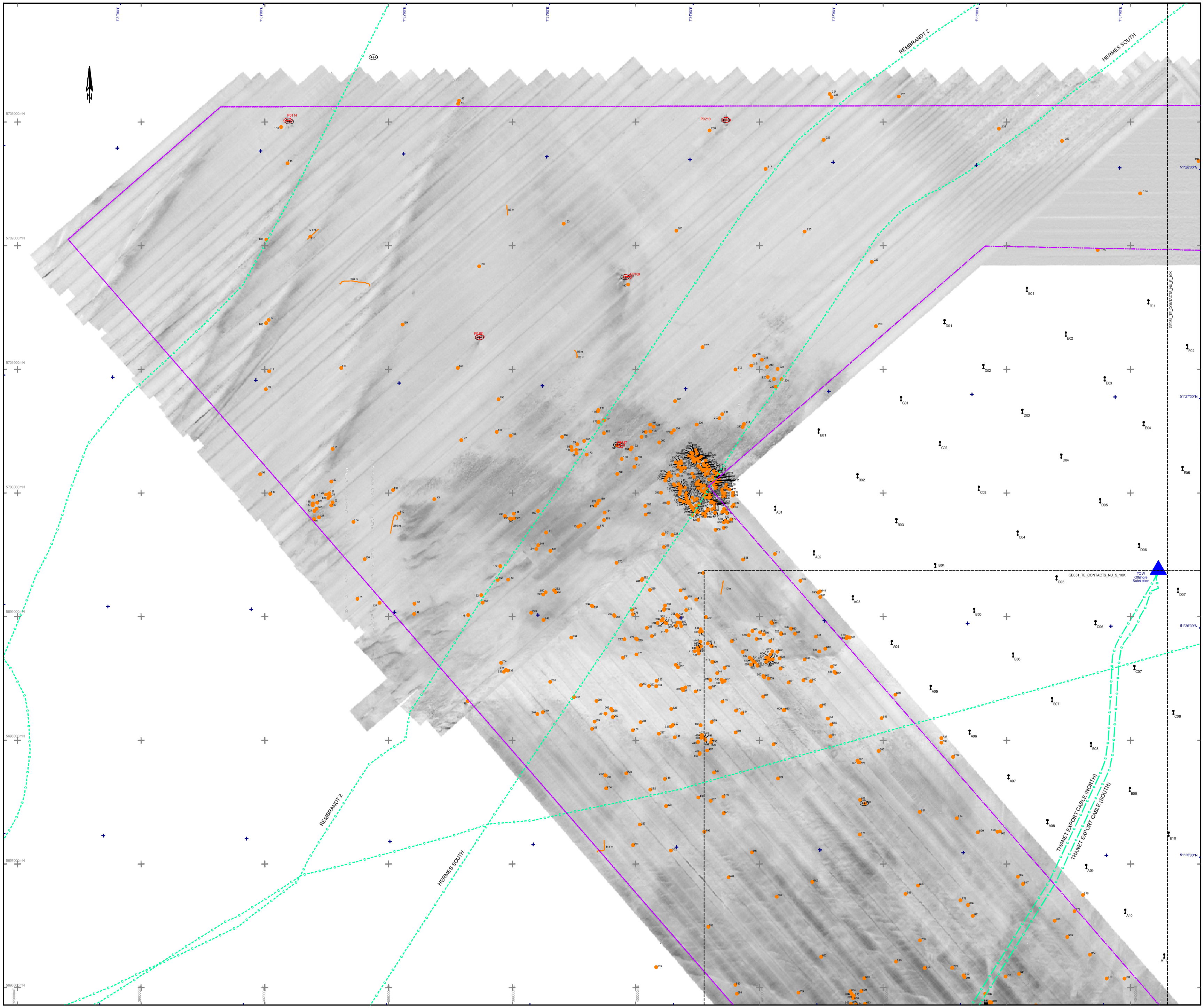
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
CONTACTS AND SIDESCAN SONAR MOSAIC CHART
EAST

SCALE 1 : 10000 at A0

Vessel: FUGRO PIONEER
Survey Date: JUL - SEPT 2016
Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_CONTACTS_NU_E_10K	1 of 3	25


REMBRANDT 2
HERMES SOUTH
THANET EXPORT CABLE (NORTH)
THANET EXPORT CABLE (SOUTH)
TOW Offshore Substation
GE051_TE_CONTACTS_NU_E_10K
GE051_TE_CONTACTS_NU_S_10K
51°28'00"N
51°27'00"N
51°26'00"N
51°25'00"N
P0114
P0210
P0189
N

LEGEND:

GENERAL

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✚	GEOGRAPHICAL GRID
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┅	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
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VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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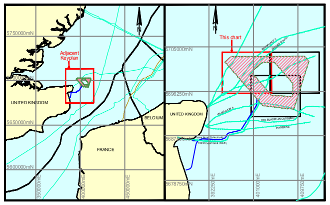

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
CONTACTS AND SIDESCAN SONAR MOSAIC CHART
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
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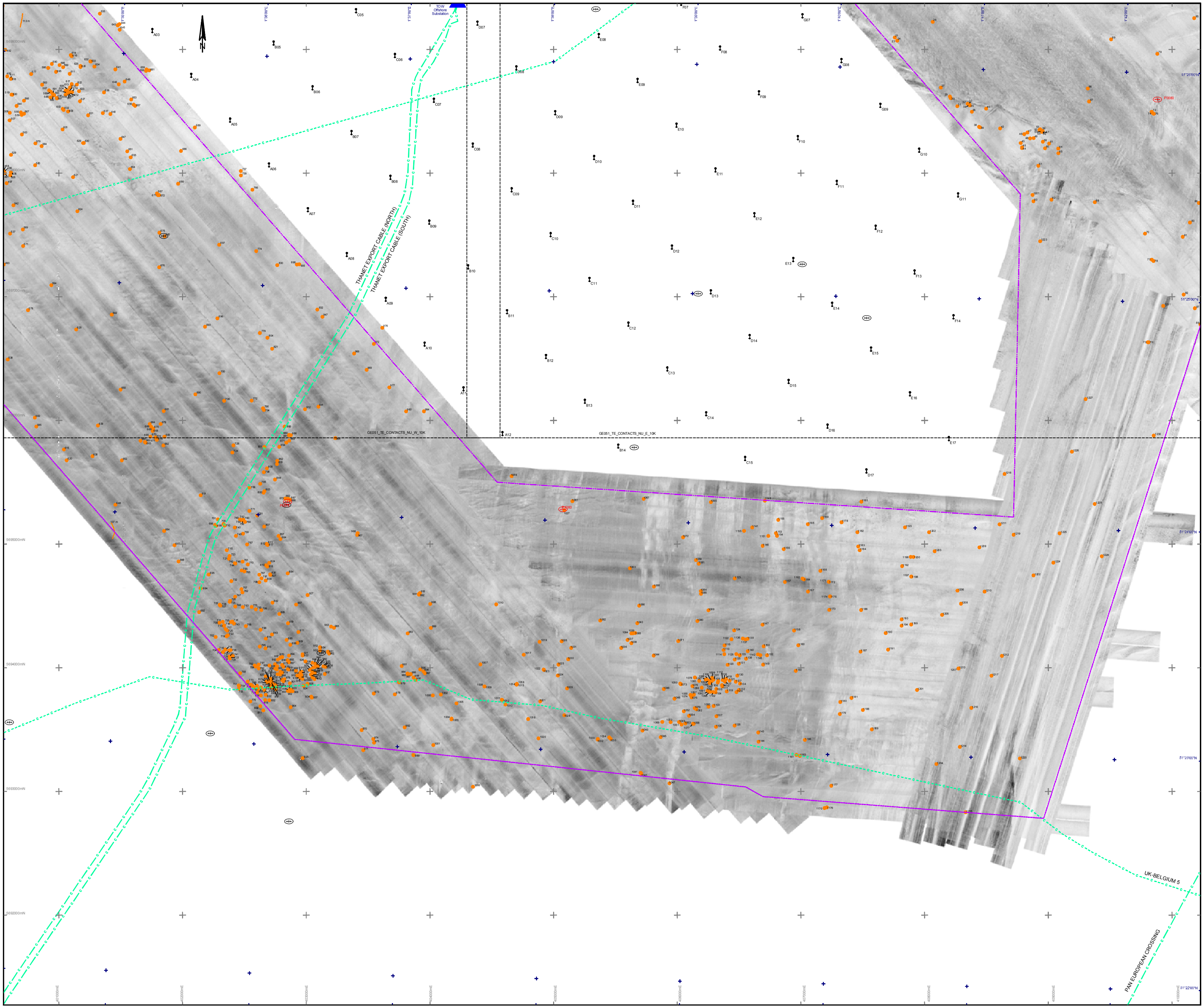
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_CONTACTS_NU_W_10K	2 of 3	26



LEGEND:

GENERAL

✛	U.T.M. GRID
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VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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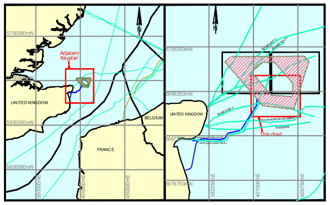

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
CONTACTS AND SIDESCAN SONAR MOSAIC CHART
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
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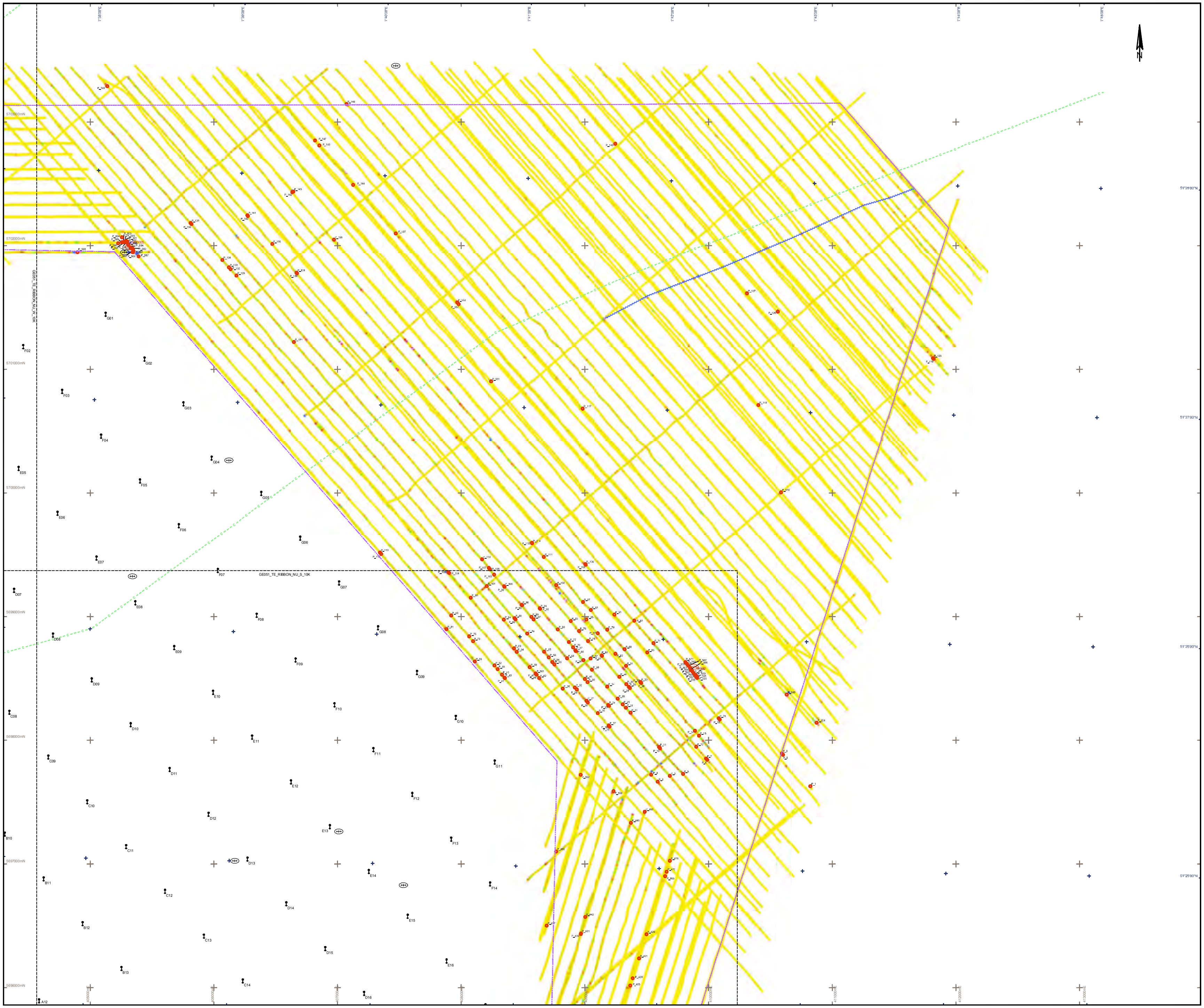
-	GE051_TE_CONTACTS_NU_S_10K	3 of 3	27



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✚	GEOGRAPHICAL GRID
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CONTACTS

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● P_123	MAGNETOMETER CONTACT WITH REFERENCE NUMBER (PREFIX OMITTED)

MAGNETOMETER RIBBON

	MAGNETOMETER RIBBON

MAGNETIC RESIDUAL SCALE BAR (in nT)

>10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0
-8.0
-9.0
>-10.0

NOTES:

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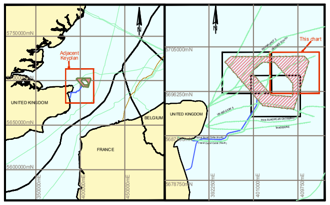
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
CONTACTS AND MAGNETOMETER RIBBON CHART
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER
Survey Date: JUL - SEPT 2016
Project Ref: GE051

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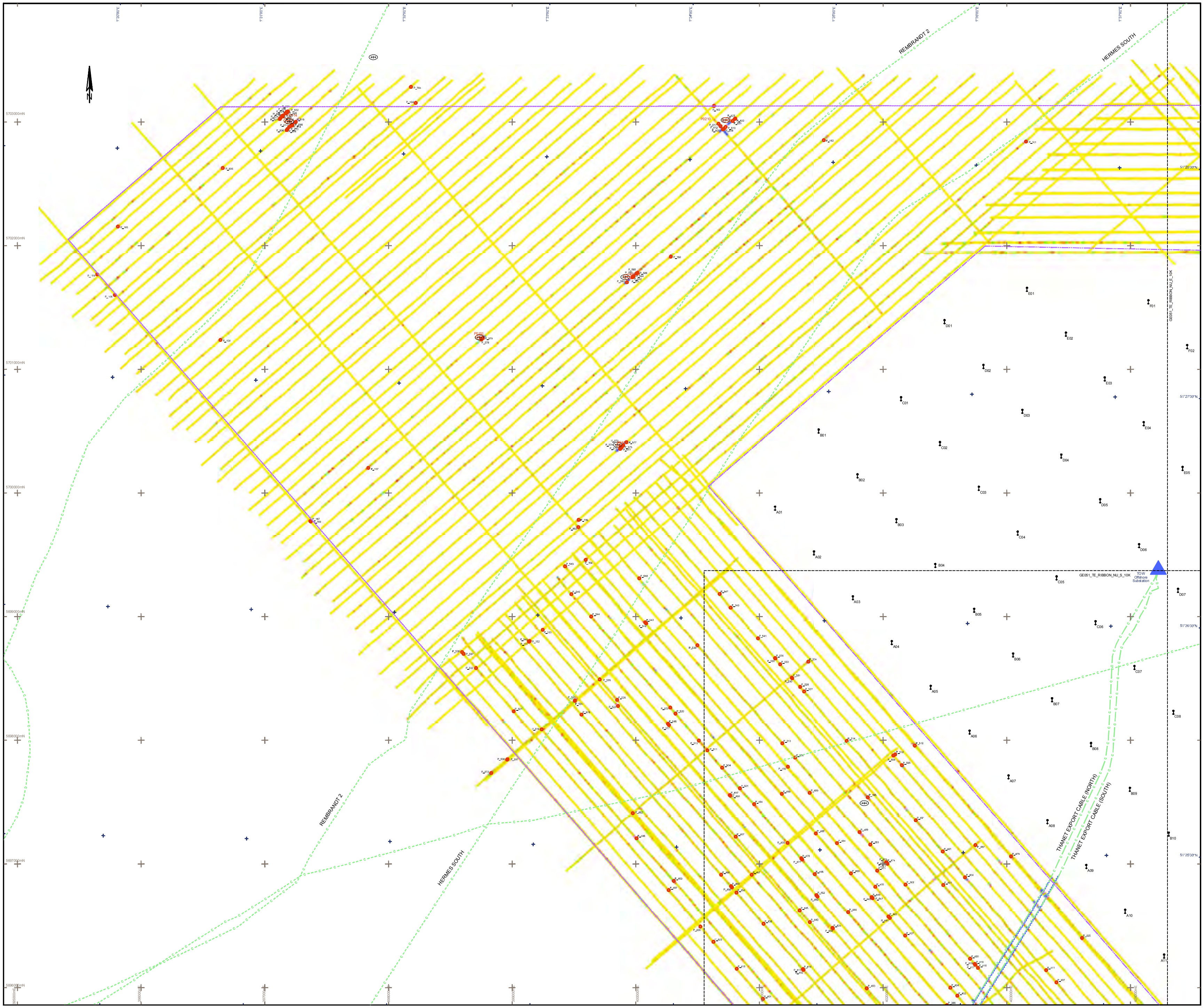
-	GE051_TE_RIBBON_NU_E_10K	1 of 3	28



LEGEND:

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✚	GEOGRAPHICAL GRID
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	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
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E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)
P123	AS-FOUND WRECK WITH SSS ID NUMBER (PREFIX OMITTED)

CONTACTS

	CABLES (POSITION INTERPRETED BY MAGNETOMETER CONTACT)
● P_123	MAGNETOMETER CONTACT WITH REFERENCE NUMBER (PREFIX OMITTED)

MAGNETOMETER RIBBON

▨	MAGNETOMETER RIBBON

MAGNETIC RESIDUAL SCALE BAR (in nT)

>10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0
-8.0
-9.0
>-10.0

NOTES:

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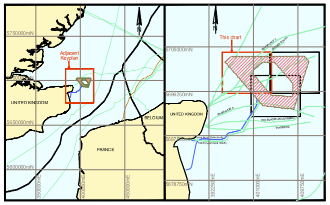

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CONTACTS AND MAGNETOMETER RIBBON CHART
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

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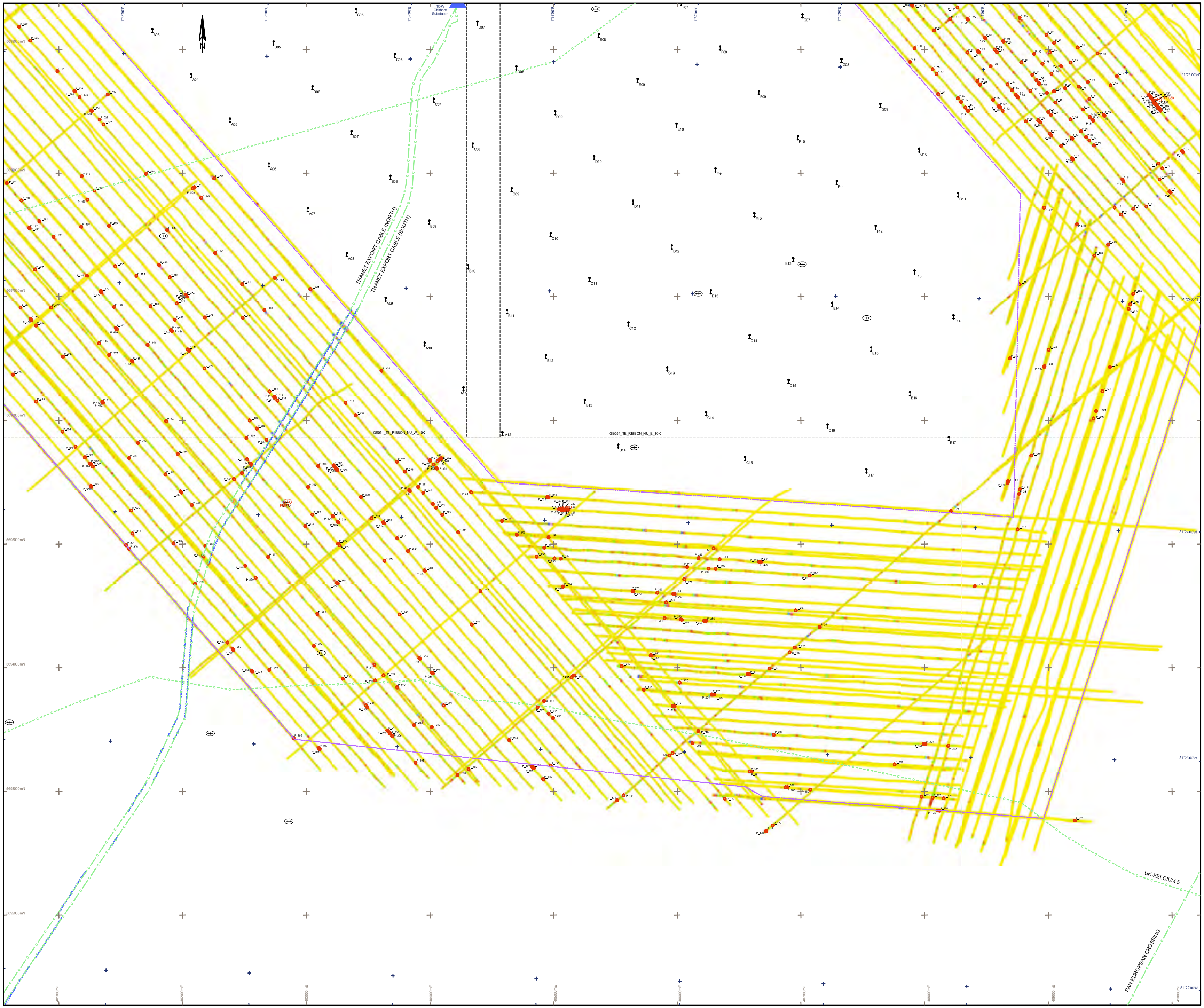

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MAGNETOMETER RIBBON

	MAGNETOMETER RIBBON

MAGNETIC RESIDUAL SCALE BAR (in nT)

>10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0
-8.0
-9.0
>-10.0

NOTES:

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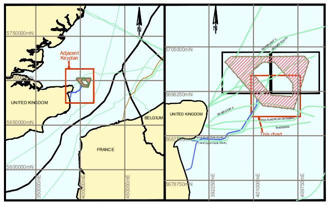

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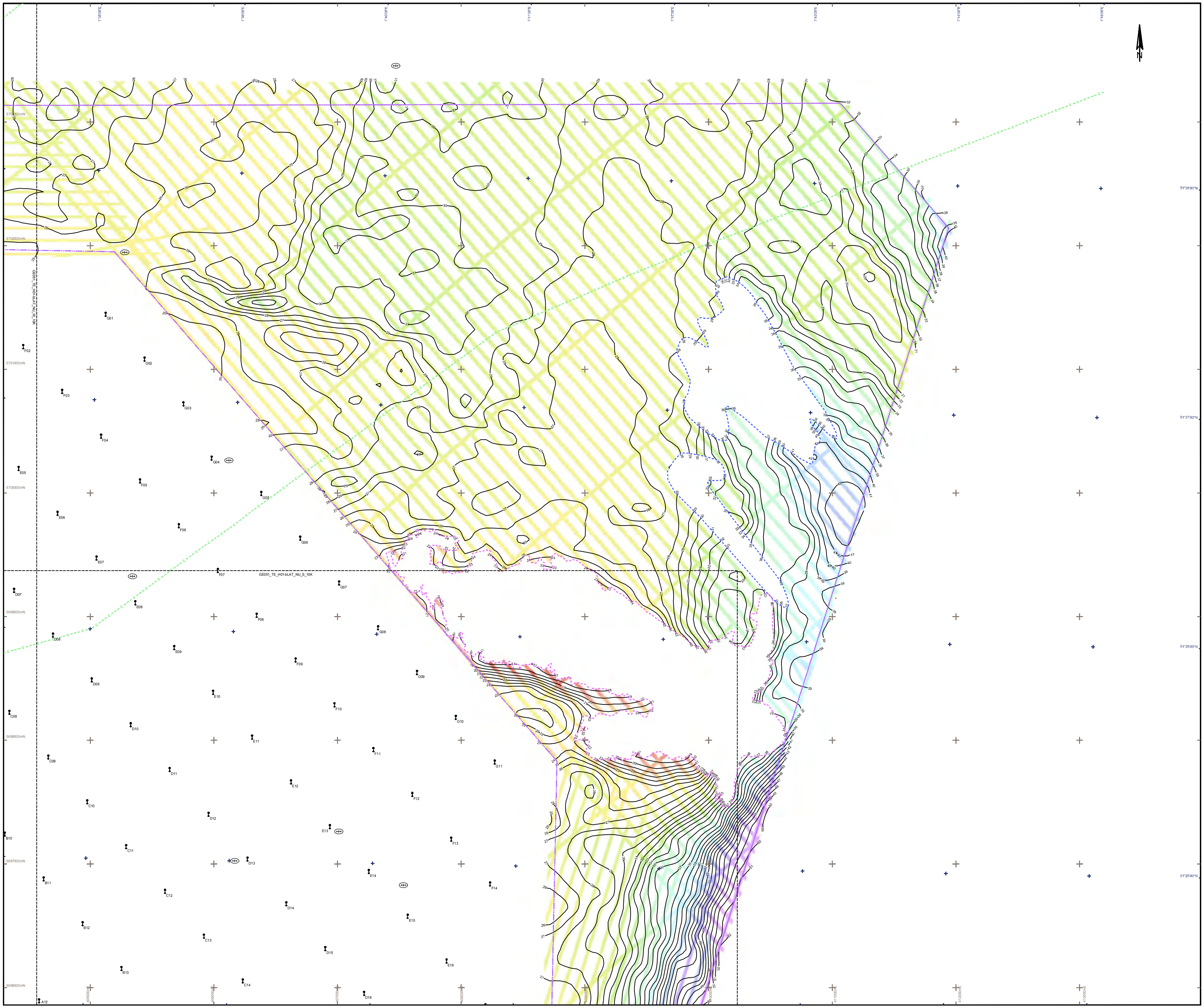
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_RIBBON_NU_S_10K	3 of 3	30

E. GEOLOGICAL CHARTS

Drawing	**Chart Name**	**Scale**
Horizon H01_bLAT	GE051_TE_H01_bLAT_NU_10K	1 : 10,000
Horizon H01_bsb	GE051_TE_H01_bsb_NU_10K	1 : 10,000
Horizon H02_bLAT	GE051_TE_H02_bLAT_NU_10K	1 : 10,000
Horizon H02_bsb	GE051_TE_H02_bsb_NU_10K	1 : 10,000
Horizon H09_bLAT	GE051_TE_H09_bLAT_NU_10K	1 : 10,000
Horizon H09_bsb	GE051_TE_H09_bsb_NU_10K	1 : 10,000
Horizon H10_bLAT	GE051_TE_H10_bLAT_NU_10K	1 : 10,000
Horizon H10_bsb	GE051_TE_H10_bsb_NU_10K	1 : 10,000
Horizon H20_bLAT	GE051_TE_H20_bLAT_NU_10K	1 : 10,000
Horizon H20_bsb	GE051_TE_H20_bsb_NU_10K	1 : 10,000
Horizon H30_bLAT	GE051_TE_H30_bLAT_NU_10K	1 : 10,000
Horizon H30_bsb	GE051_TE_H30_bsb_NU_10K	1 : 10,000
Horizon H40_bLAT	GE051_TE_H40_bLAT_NU_10K	1 : 10,000
Horizon H40_bsb	GE051_TE_H40_bsb_NU_10K	1 : 10,000



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
- - -	EXISTING CABLE ROUTES
-·-·-	WIND FARM BOUNDARY (TOW)
-----	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)

30	DEPTH IN METRES BELOW LAT (CONTOURS AT 1 METRE INTERVAL)
- - -	H01 ABSENT
- - -	H01 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H01 RANGES BETWEEN 13.3 m AND 53.3 m bLAT

20.0
30.0
40.0
50.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SUB-BOTTOM PROFILER ARRAY.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. NO GRIDDING, SMOOTHNESS 6, CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 1 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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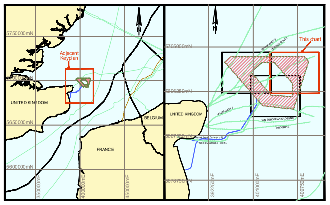

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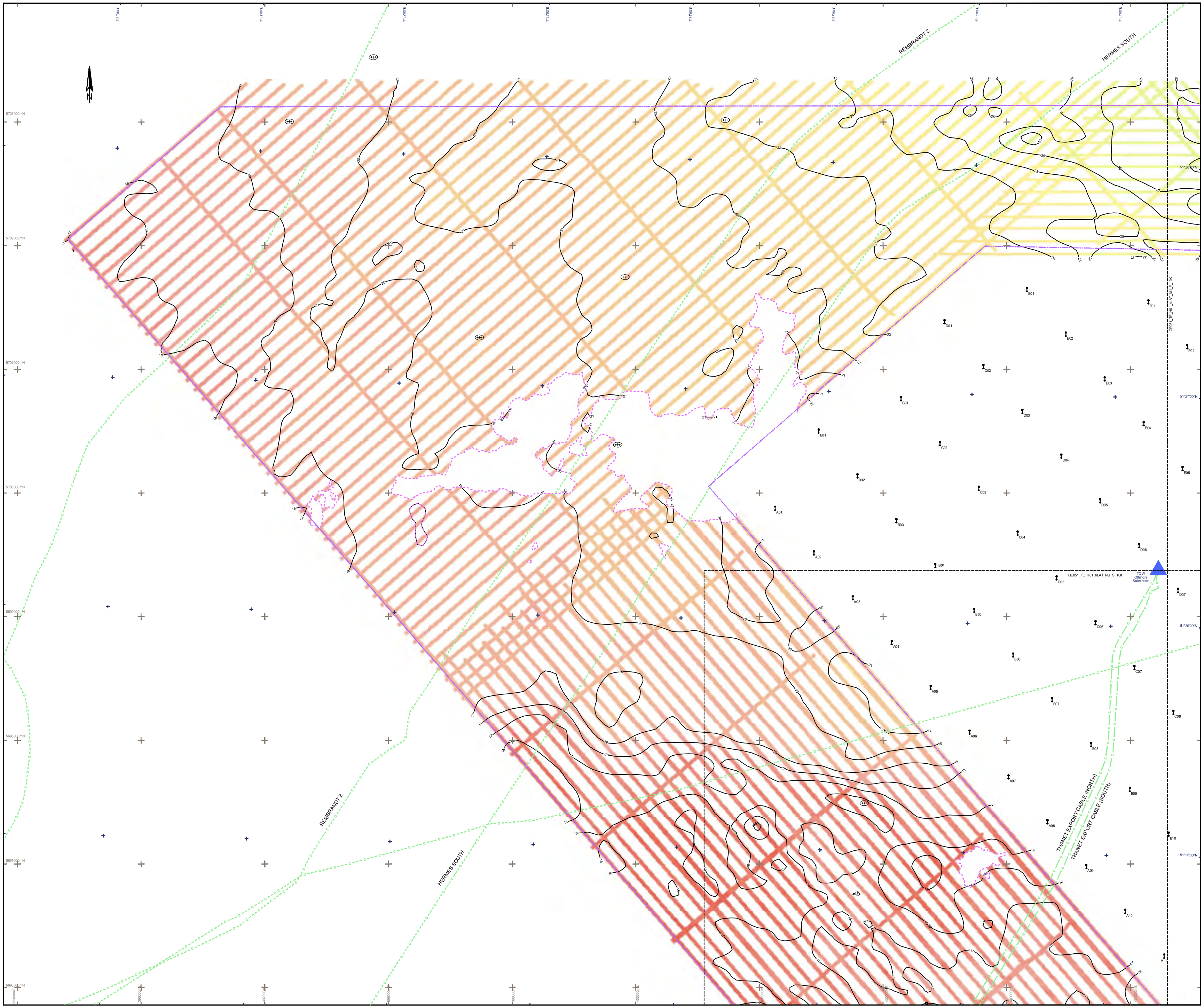
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)
METRES BELOW LAT
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H01_bLAT_NU_E_10K	1 of 3	31



LEGEND:

GENERAL

+	U.T.M. GRID
+	GEOGRAPHICAL GRID
==C==	EXISTING CABLE ROUTES
-·-·-	WIND FARM BOUNDARY (TOW)
-----	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
(+++)	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)

30	DEPTH IN METRES BELOW LAT (CONTOURS AT 1 METRE INTERVAL)
- - -	H01 ABSENT
- - -	H01 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H01 RANGES BETWEEN 13.3 m AND 53.3 m bLAT

20.0
30.0
40.0
50.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SUB-BOTTOM PROFILER ARRAY.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. NO GRIDDING, SMOOTHNESS 6, CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 1 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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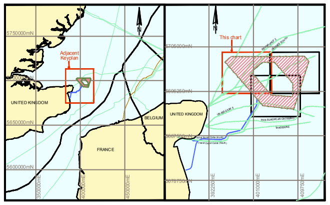

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)
METRES BELOW LAT
WEST

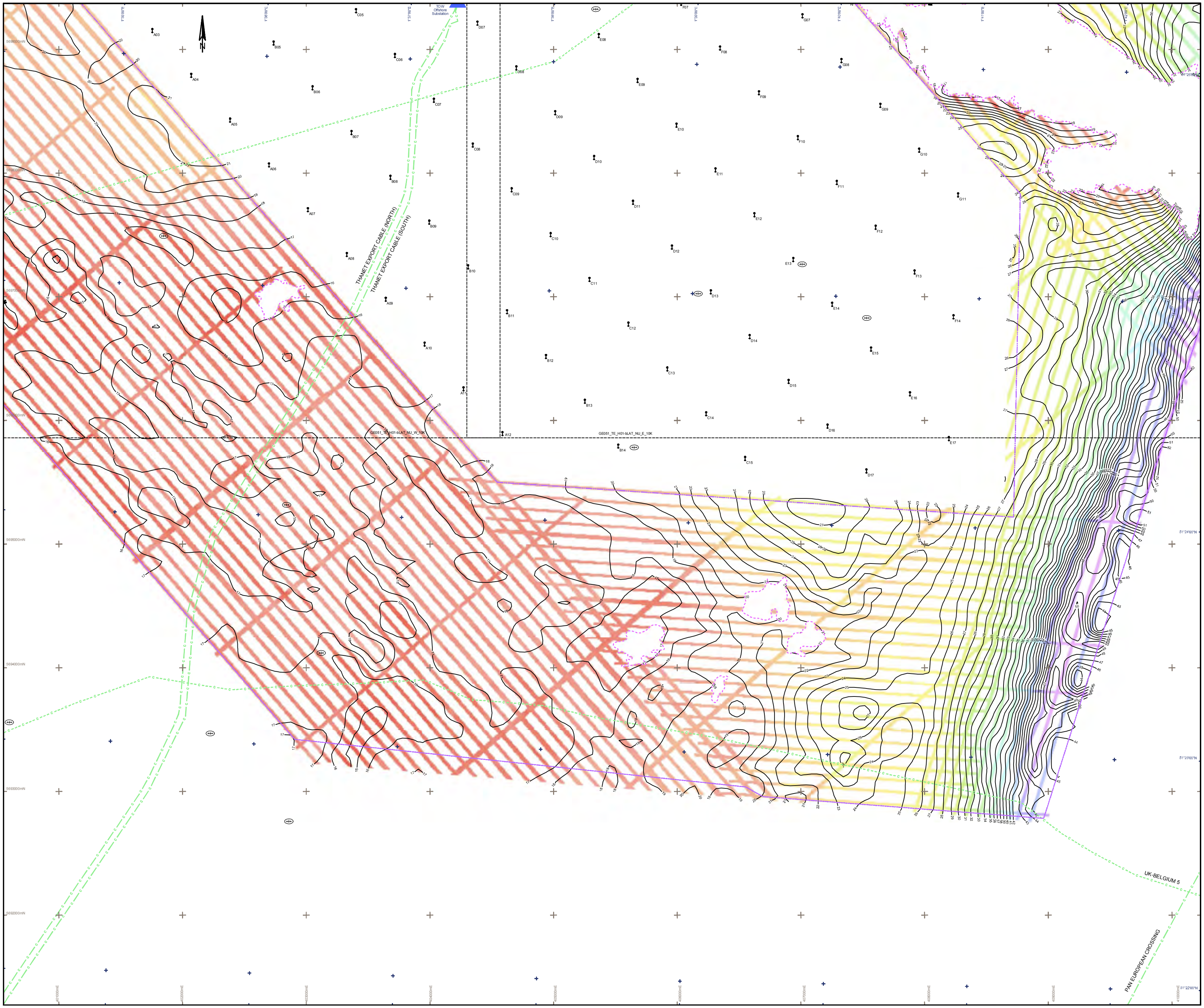
SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER
Survey Date: JUL - SEPT 2016
Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H01-bLAT_NU_W_10K	2 of 3	32



LEGEND:

GENERAL

+	U.T.M. GRID
+	GEOGRAPHICAL GRID
═C═	EXISTING CABLE ROUTES
─·─	WIND FARM BOUNDARY (TOW)
-----	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
(+++)	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)

30	DEPTH IN METRES BELOW LAT (CONTOURS AT 1 METRE INTERVAL)
- - -	H01 ABSENT
- - -	H01 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H01 RANGES BETWEEN 13.3 m AND 53.3 m bLAT

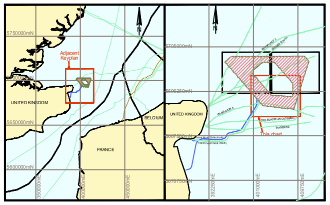
20.0
30.0
40.0
50.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SUB-BOTTOM PROFILER ARRAY.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. NO GRIDDING, SMOOTHNESS 6, CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 1 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)
METRES BELOW LAT
SOUTH

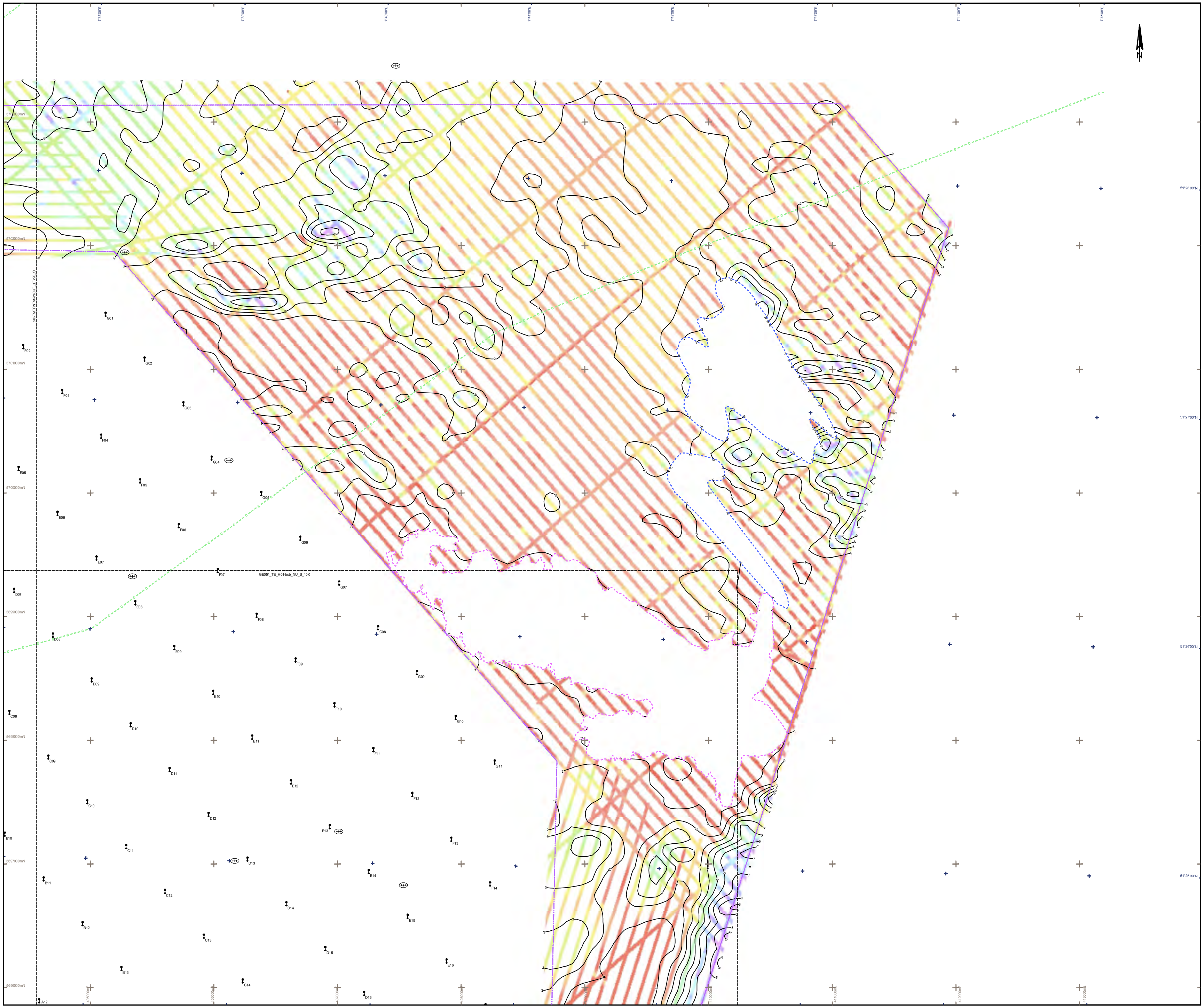
SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER
Survey Date: JUL - SEPT 2016
Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H01-bLAT_NU_S_10K	3 of 3	33



LEGEND:

GENERAL

- ✚ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)

- 4 DEPTH IN METRES BELOW SEABED (CONTOURS AT 1 METRE INTERVAL)
- H01 ABSENT
- H01 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H01 RANGES BETWEEN 0.0 m AND 13.2 m bsb

2.0
6.0
10.0

NOTES:

1. INTERPRETATION BASED ON HULL-MOUNTED MASSA TR-1075 SUB-BOTTOM PROFILER ARRAY.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. NO GRIDDING, SMOOTHNESS 6, CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 1 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.
8. THE AREAS WHERE DEPTH LESS THAN 1 m ARE NOT WELL DEFINED DUE TO SEABED PULSE RINGING.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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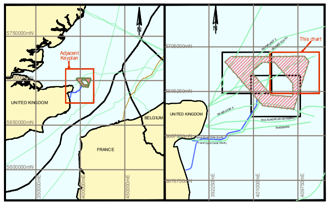

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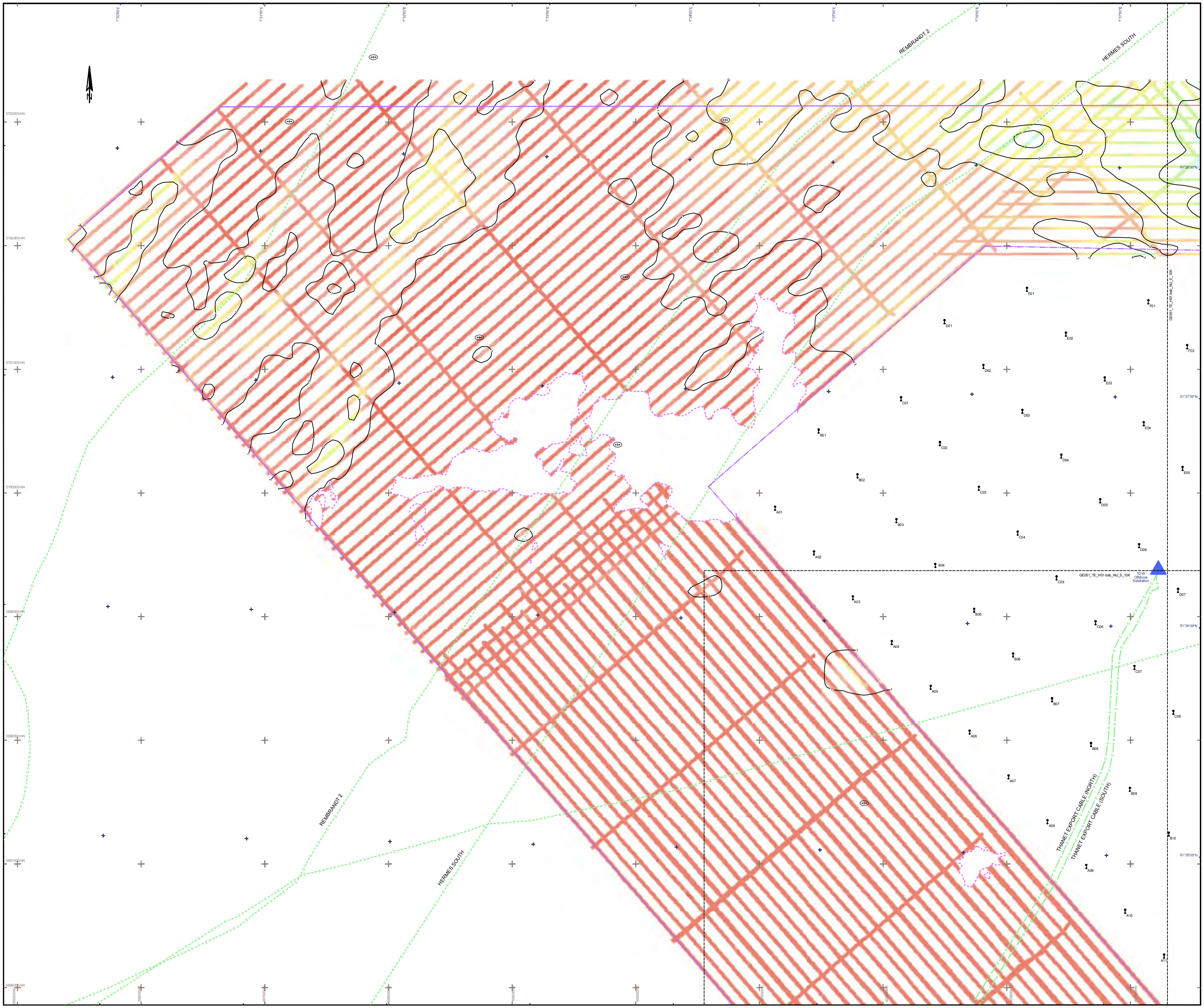
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)
METRES BELOW SEABED
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H01-bsb_NU_E_10K	1 of 3	34



LEGEND:

GENERAL

- + U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)

- 4 DEPTH IN METRES BELOW SEABED (CONTOURS AT 1 METRE INTERVAL)
- H01 ABSENT
- H01 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H01 RANGES BETWEEN 0.0 m AND 13.2 m bsb

2.0
6.0
10.0

NOTES:

1. INTERPRETATION BASED ON HULL-MOUNTED MASSA TR-1075 SUB-BOTTOM PROFILER ARRAY.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. NO GRIDDING, SMOOTHNESS 6, CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 1 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.
8. THE AREAS WHERE DEPTH LESS THAN 1 m ARE NOT WELL DEFINED DUE TO SEABED PULSE RINGING.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
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False Northing	0mN
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VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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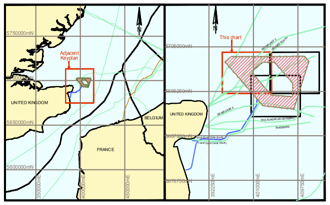

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)
METRES BELOW SEABED
WEST

SCALE 1 : 10000 at A0

Vessel: FUGRO PIONEER
Survey Date: JUL - SEPT 2016
Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
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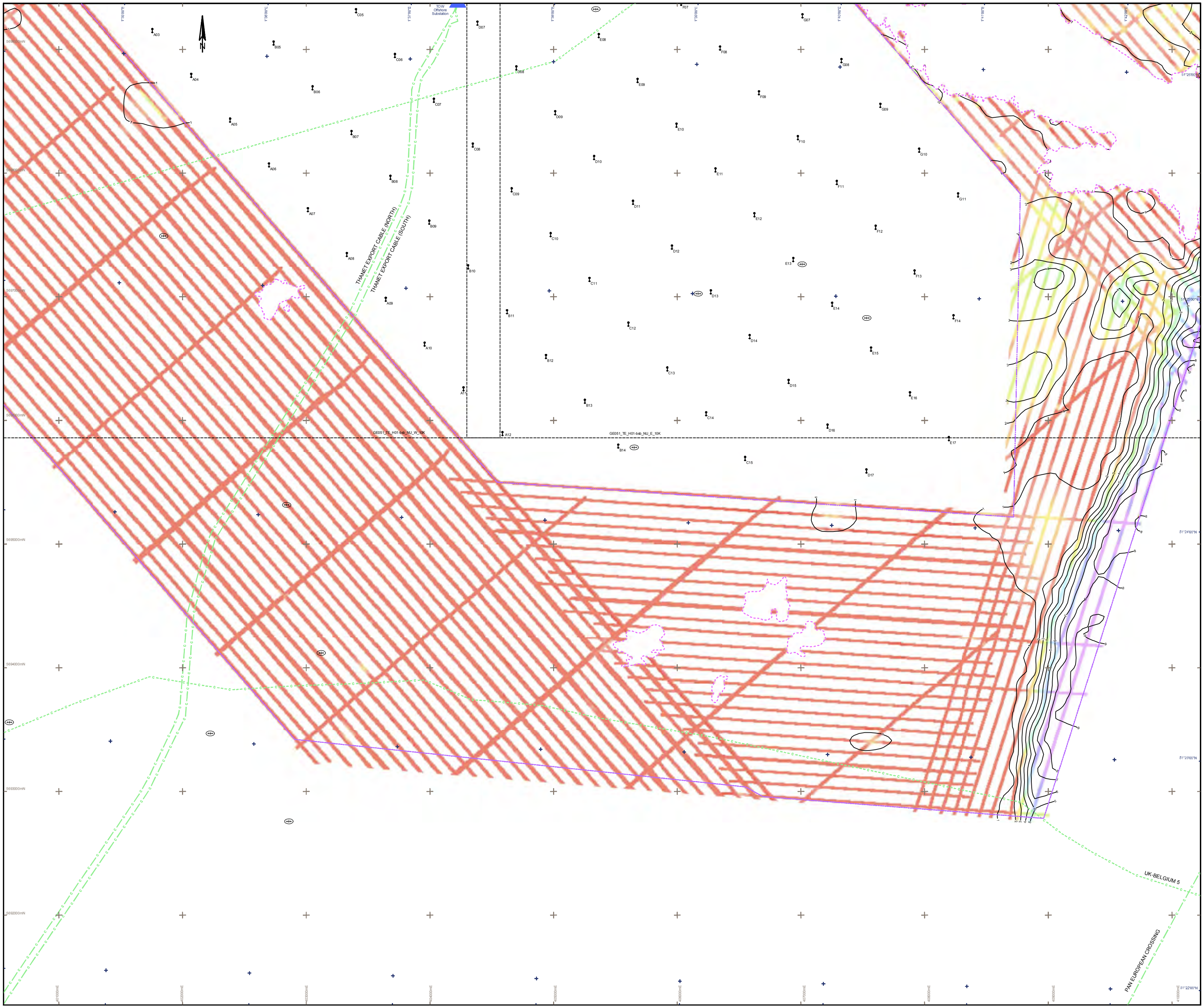
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H01-bsb_NU_W_10K	2 of 3	35



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
═ C ═	EXISTING CABLE ROUTES
—·—	WIND FARM BOUNDARY (TOW)
┅┅	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
– – –	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)

4 ⁓	DEPTH IN METRES BELOW SEABED (CONTOURS AT 1 METRE INTERVAL)
- - -	H01 ABSENT
- - -	H01 NOT WELL DEFINED
2.0 6.0 10.0	DEPTH IN METRES BELOW SEABED THE DEPTH OF H01 RANGES BETWEEN 0.0 m AND 13.2 m bsb

NOTES:

1. INTERPRETATION BASED ON HULL-MOUNTED MASSA TR-1075 SUB-BOTTOM PROFILER ARRAY.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. NO GRIDDING, SMOOTHNESS 6, CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 1 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.
8. THE AREAS WHERE DEPTH LESS THAN 1 m ARE NOT WELL DEFINED DUE TO SEABED PULSE RINGING.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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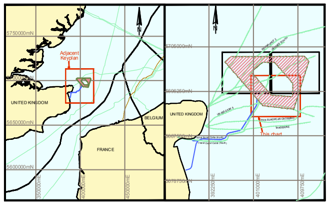

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA

THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF SOUTHERN BIGHT Fm. (HORIZON H01)
METRES BELOW SEABED
SOUTH

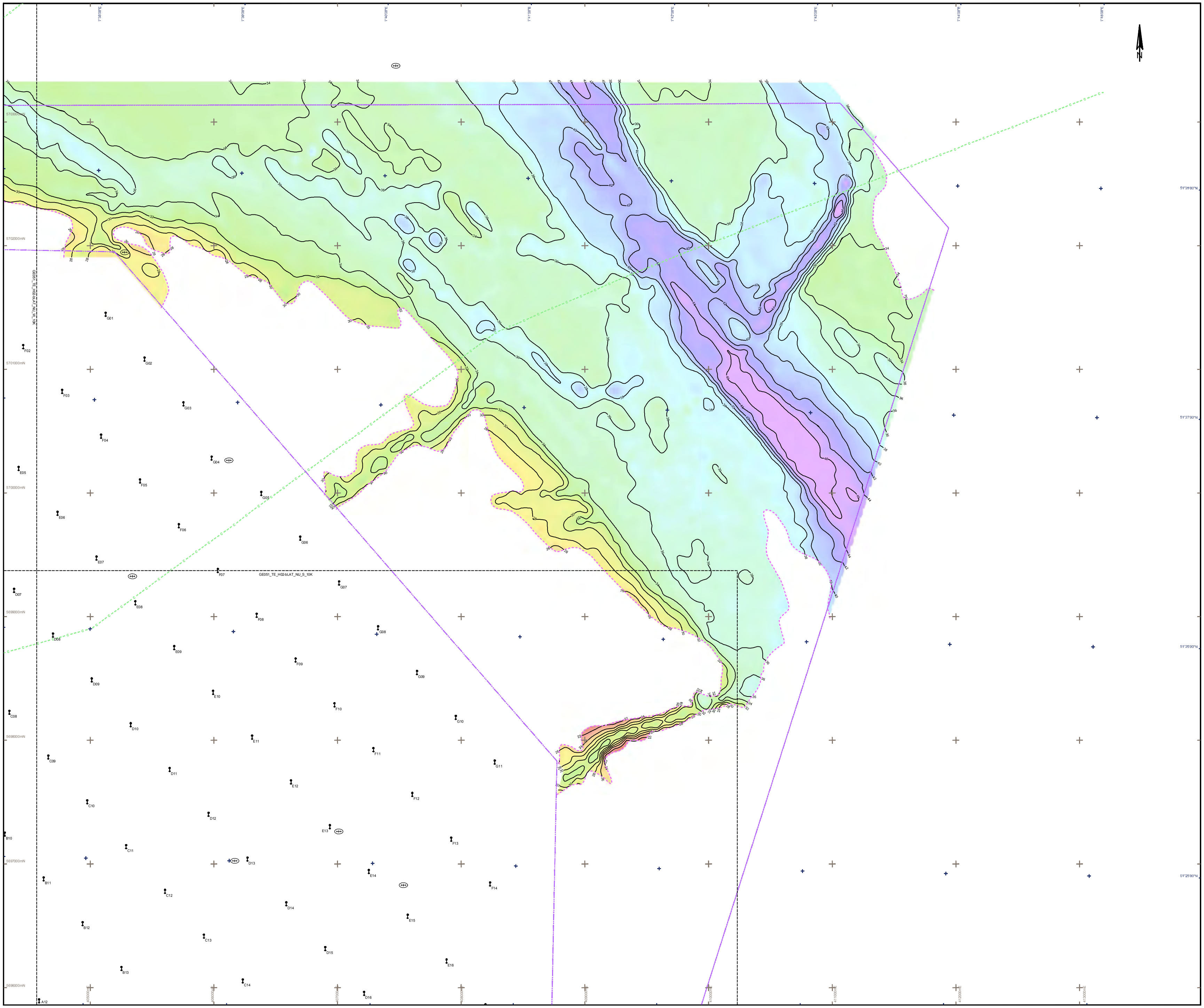
SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER
Survey Date: JUL - SEPT 2016
Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H01-bsb_NU_S_10K	3 of 3	36



LEGEND:

GENERAL

- ✚ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF CHANNEL (HORIZON H02)

- 30 DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- H02 ABSENT
- H02 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT

THE DEPTH OF H02 RANGES BETWEEN 17.3 m AND 48.5 m bLAT

20.0
25.0
30.0
35.0
40.0
45.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SBP ARRAY AND UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 6. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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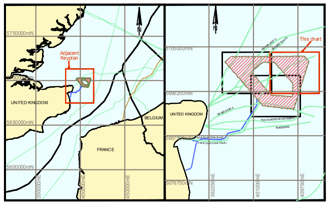

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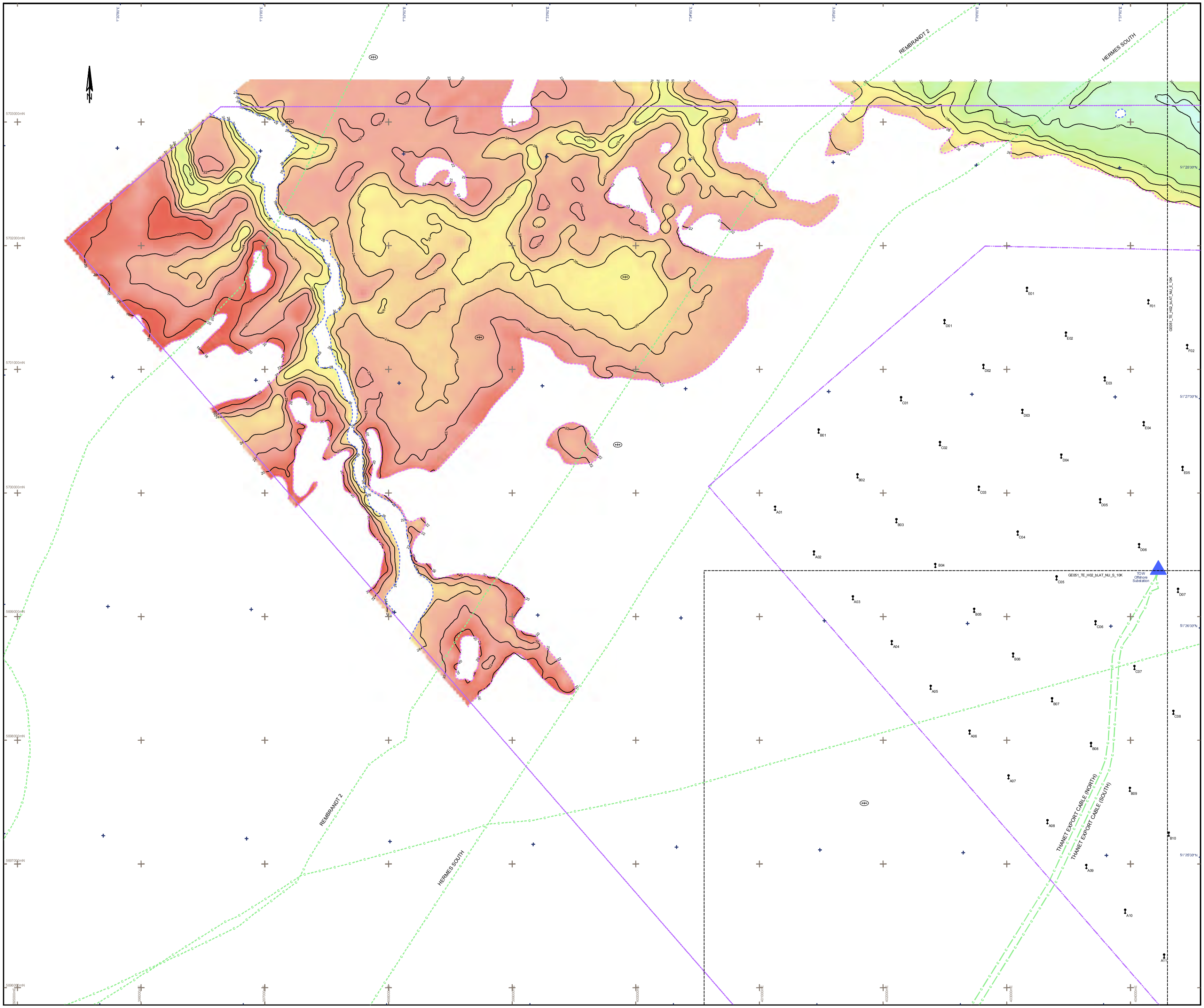
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF CHANNEL (HORIZON H02)
METRES BELOW LAT
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER	Survey Date: JUL - SEPT 2016	Project Ref: GE051				
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL
Client Ref: -	Drawing No: GE051_TE_H02_bLAT_NU_E_10K	Chart: 1 of 3	Encl: 37			



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
═ C ═	EXISTING CABLE ROUTES
–··–	WIND FARM BOUNDARY (TOW)
----	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
(+++)	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF CHANNEL (HORIZON H02)

30	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- - -	H02 ABSENT
- - -	H02 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT

THE DEPTH OF H02 RANGES BETWEEN 17.3 m AND 48.5 m bLAT

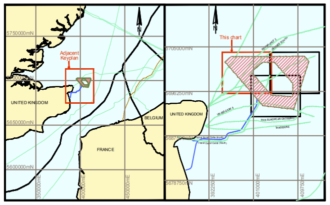
20.0
25.0
30.0
35.0
40.0
45.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SBP ARRAY AND UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 6. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID Semi-Major Axis Inverse Flattening	GRS 1980 6,378,137.000 298.257 222 101
PROJECTION Central Meridian (CM) Latitude of Origin False Easting False Northing Scale Factor at CM	ETRS89 / UTM zone 31N 03°00'00" E 00°00'00" N 500,000mE 0mN 0.9996
DATUM TRANSFORMATION Source	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016) EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA

THANET EXTENSION OFFSHORE WIND FARM

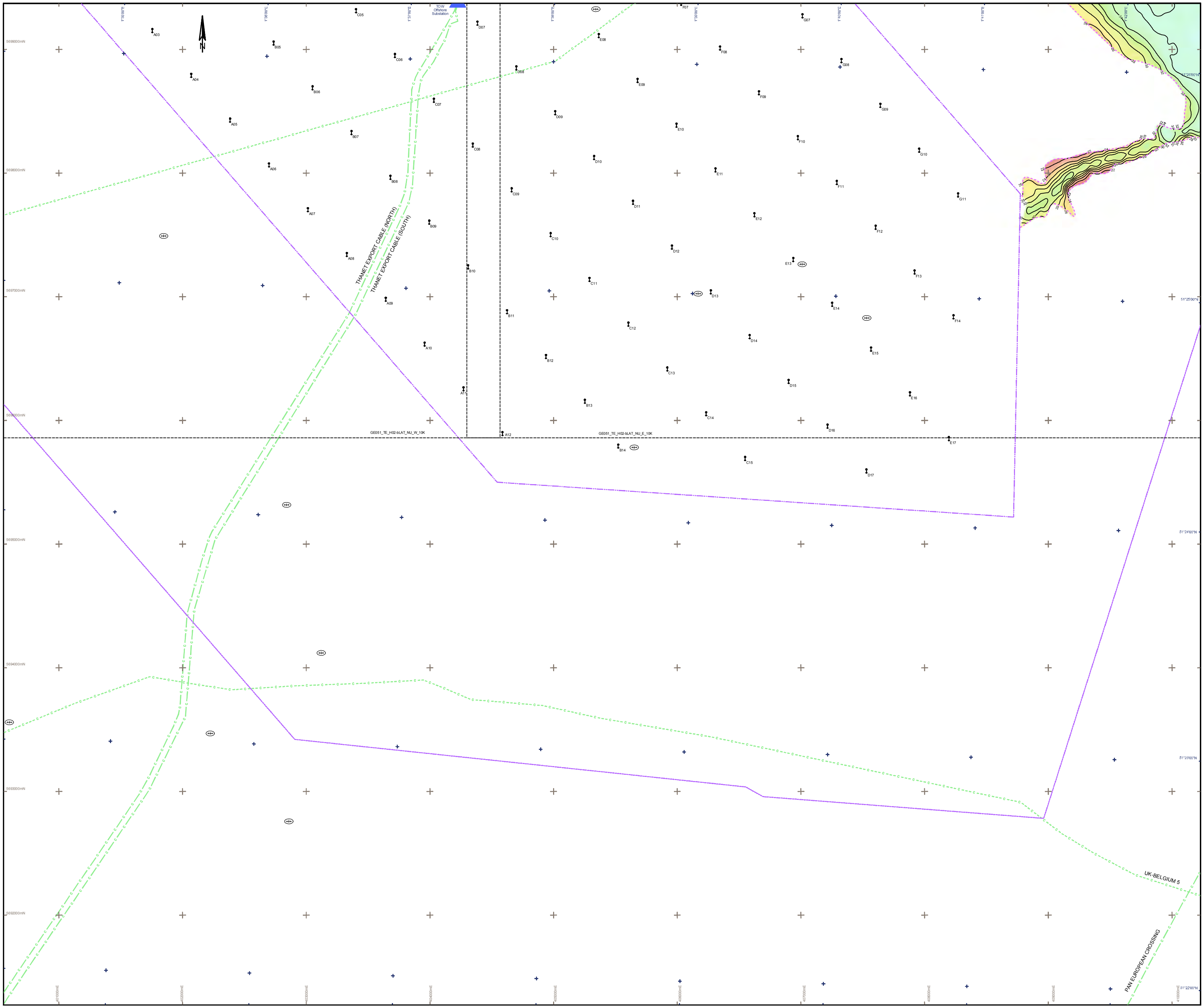
DEPTH TO BASE OF CHANNEL (HORIZON H02)
METRES BELOW LAT
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER	Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H02-bLAT_NU_W_10K	2 of 3	38



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
	EXISTING CABLE ROUTES
	WIND FARM BOUNDARY (TOW)
	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF CHANNEL (HORIZON H02)

30	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
	H02 ABSENT
	H02 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT

THE DEPTH OF H02 RANGES BETWEEN 17.3 m AND 48.5 m bLAT

20.0
25.0
30.0
35.0
40.0
45.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SBP ARRAY AND UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 6. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00' E
Latitude of Origin	00°00'00' N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG
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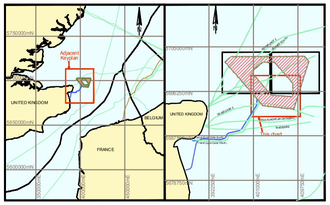
	rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.002671 8ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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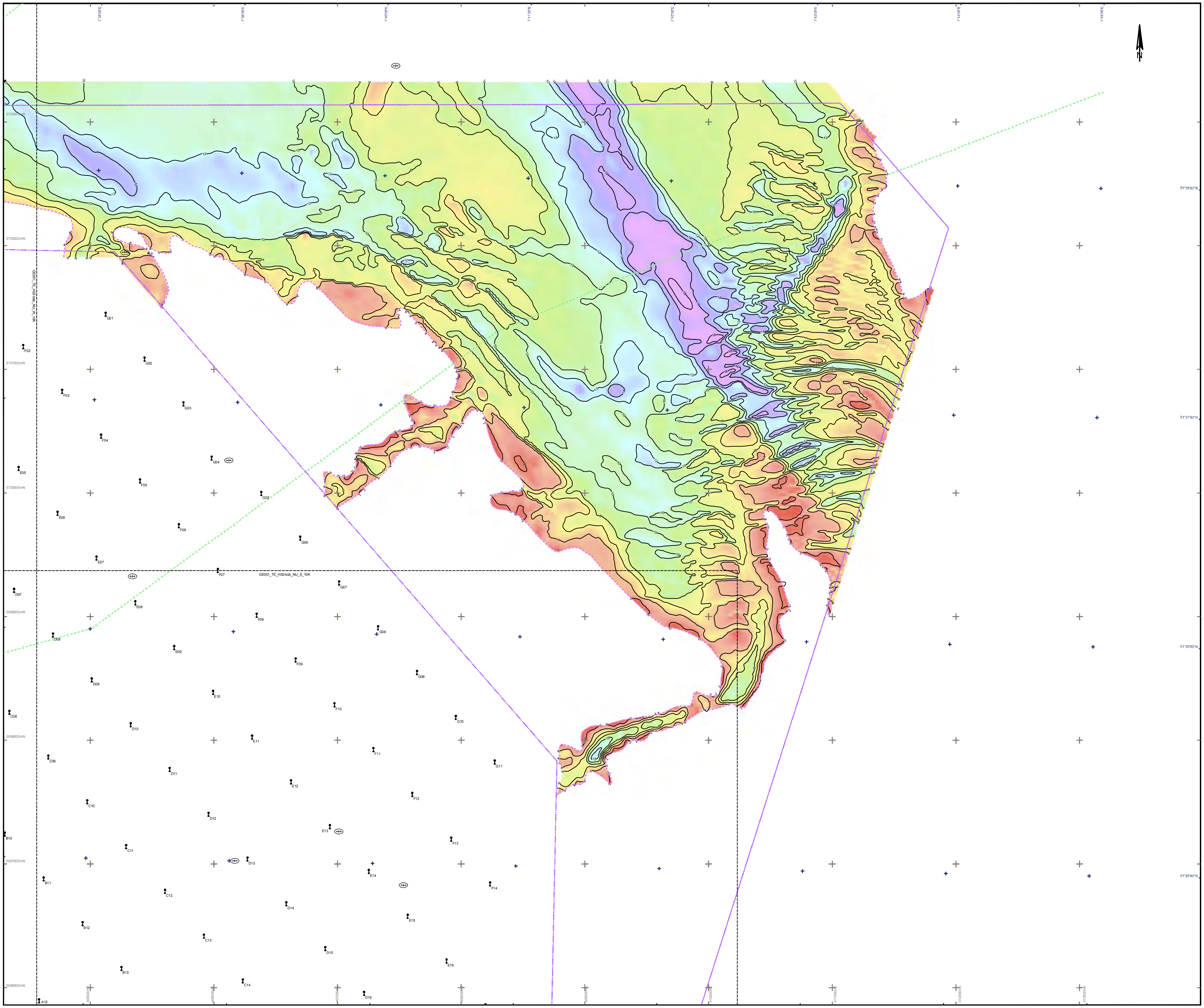
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF CHANNEL (HORIZON H02)
METRES BELOW LAT
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H02-bLAT_NU_S_10K	3 of 3	39



LEGEND:

GENERAL

- ✛ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF CHANNEL (HORIZON H02)

- 10 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- H02 ABSENT
- H02 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED

THE DEPTH OF H02 RANGES BETWEEN 0.1 m AND 20.0 m bsb

5.0
10.0
15.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SBP ARRAY AND UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 6. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
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Inverse Flattening	298.257 222 101
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False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
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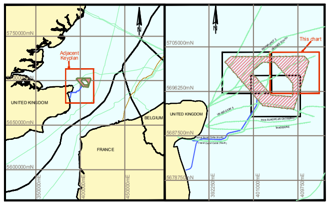
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA

THANET EXTENSION OFFSHORE WIND FARM

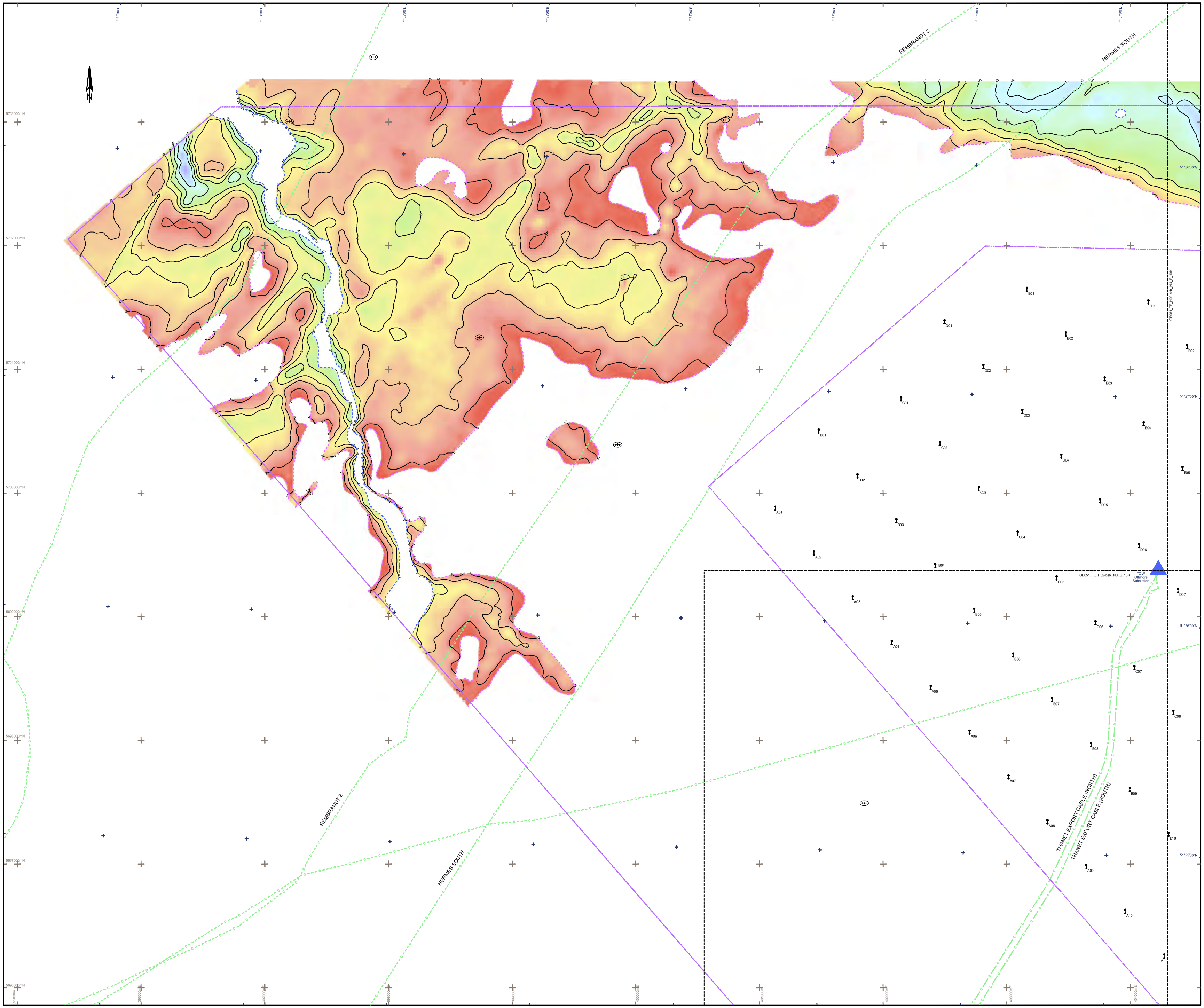
DEPTH TO BASE OF CHANNEL (HORIZON H02)
METRES BELOW SEABED
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H02-bsb_NU_E_10K	1 of 3	40



LEGEND:

GENERAL

- ✚ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF CHANNEL (HORIZON H02)

- 10 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- H02 ABSENT
- H02 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED

THE DEPTH OF H02 RANGES BETWEEN 0.1 m AND 20.0 m bsb

5.0
10.0
15.0

NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SBP ARRAY AND UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 6. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s.
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GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
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Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
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False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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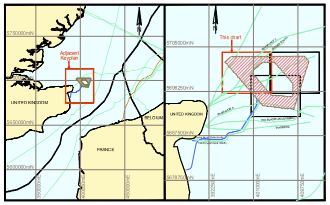

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF CHANNEL (HORIZON H02)
METRES BELOW SEABED
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER	Survey Date: JUL - SEPT 2016	Project Ref: GE051				
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
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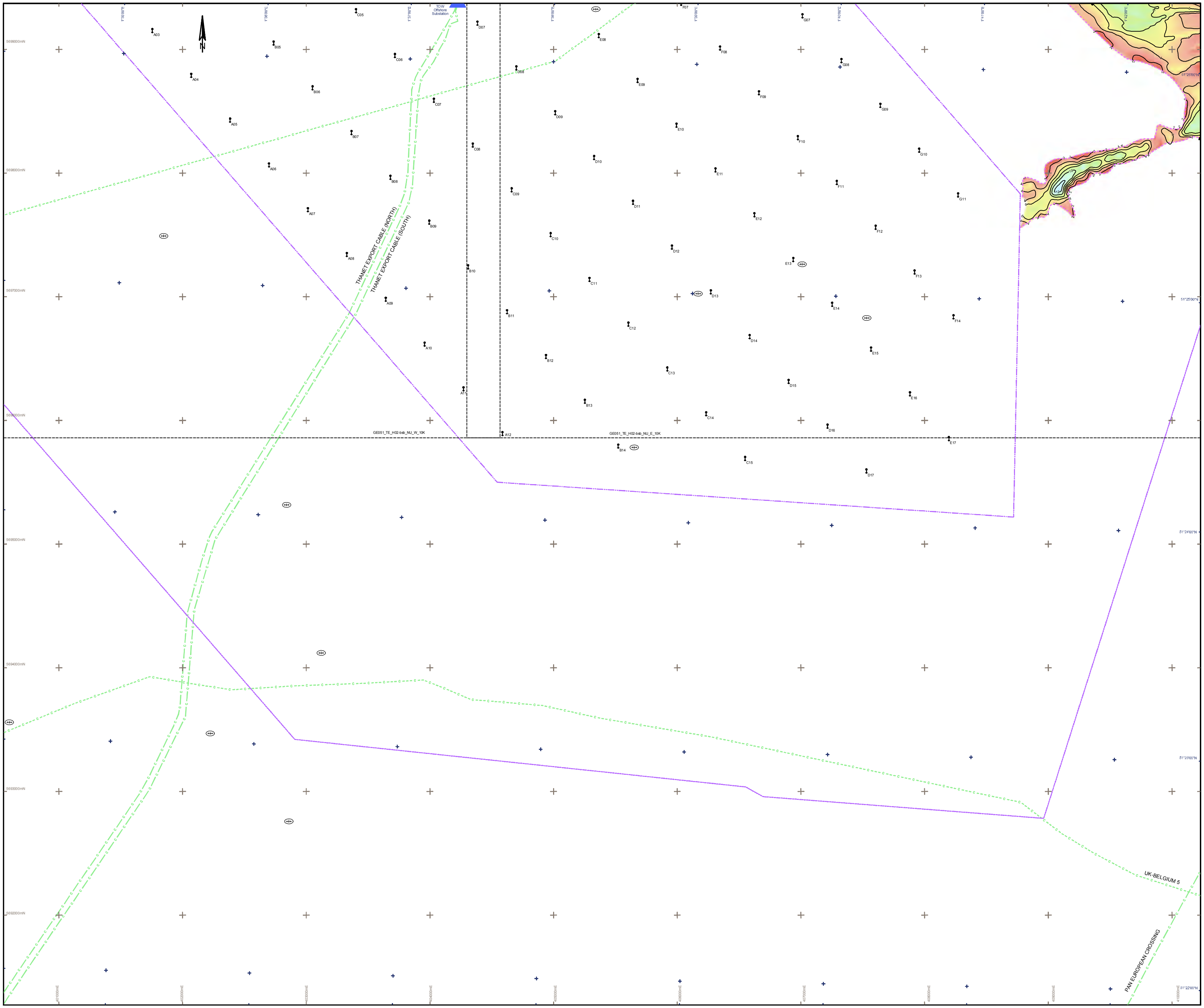
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H02-bsb_NU_W_10K	2 of 3	41



LEGEND:

GENERAL

- + U.T.M. GRID
- + GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF CHANNEL (HORIZON H02)

- 10 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- H02 ABSENT
- H02 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED

THE DEPTH OF H02 RANGES BETWEEN 0.1 m AND 20.0 m bsb

5.0

10.0

15.0

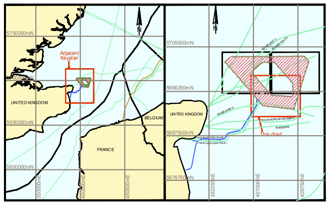
NOTES:

1. INTERPRETATION BASED ON HULL MOUNTED MASSA TR-1075 SBP ARRAY AND UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION OF THE HORIZON, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 6. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. SHALLOW GEOLOGICAL INTERPRETATION BASED ON ASSUMED ACOUSTIC VELOCITY IN SEDIMENTS OF 1600 m/s.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS BASED ON THE BGS REPORT OF THE THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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Tel: +31 70 311 1800, Fax: +31 70 311 1838, Email: fsbvinfo@fugro.com

GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF CHANNEL (HORIZON H02)
METRES BELOW SEABED
SOUTH

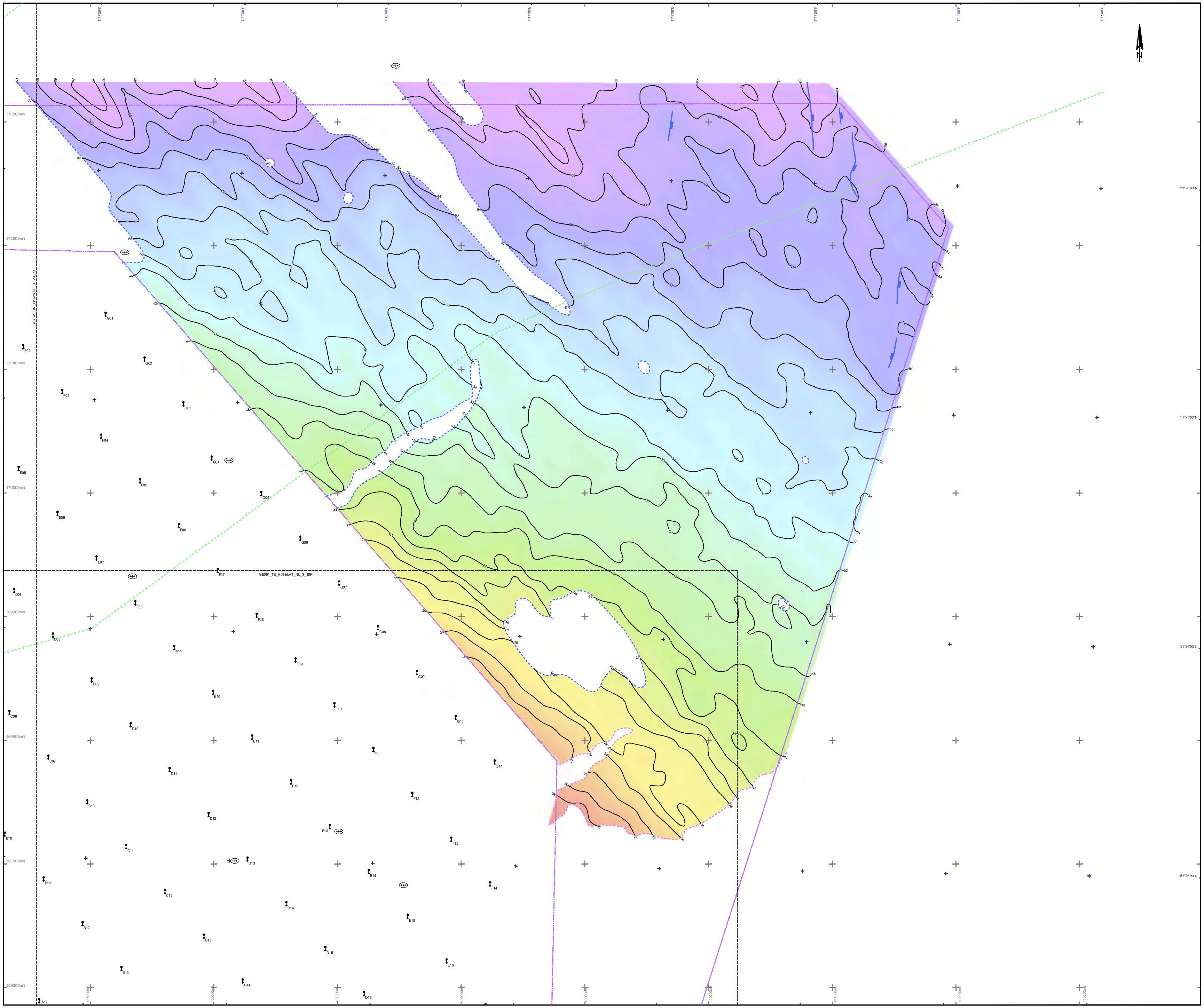
SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres

0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H02-bsb_NU_S_10K	3 of 3	27



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
- - -	EXISTING CABLE ROUTES
-·-·-	WIND FARM BOUNDARY (TOW)
······	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)

50	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
—	FAULT AT H09
- - -	H09 ABSENT
- - -	H09 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H09 RANGES BETWEEN 20 m AND 72 m bLAT

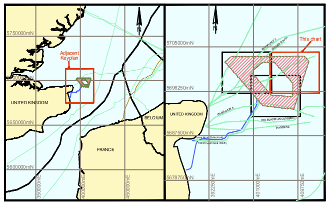
30.0
40.0
50.0
60.0
70.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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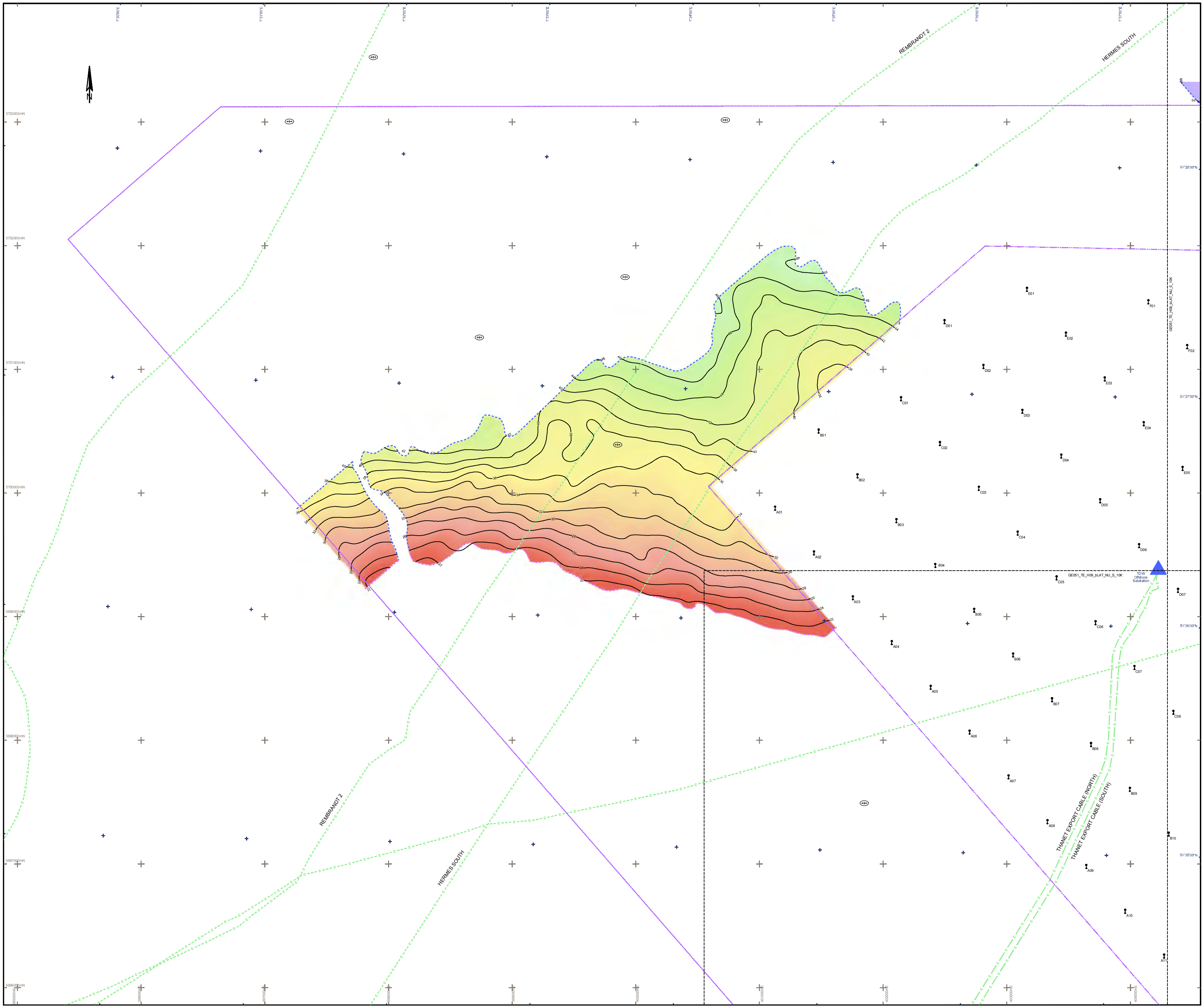
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)
METRES BELOW LAT
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H09_bLAT_NU_E_10K	1 of 3	43



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
	EXISTING CABLE ROUTES
	WIND FARM BOUNDARY (TOW)
	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)

50	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
	FAULT AT H09
	H09 ABSENT
	H09 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H09 RANGES BETWEEN 20 m AND 72 m bLAT

30.0
40.0
50.0
60.0
70.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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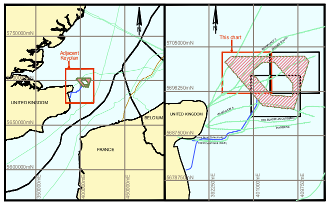

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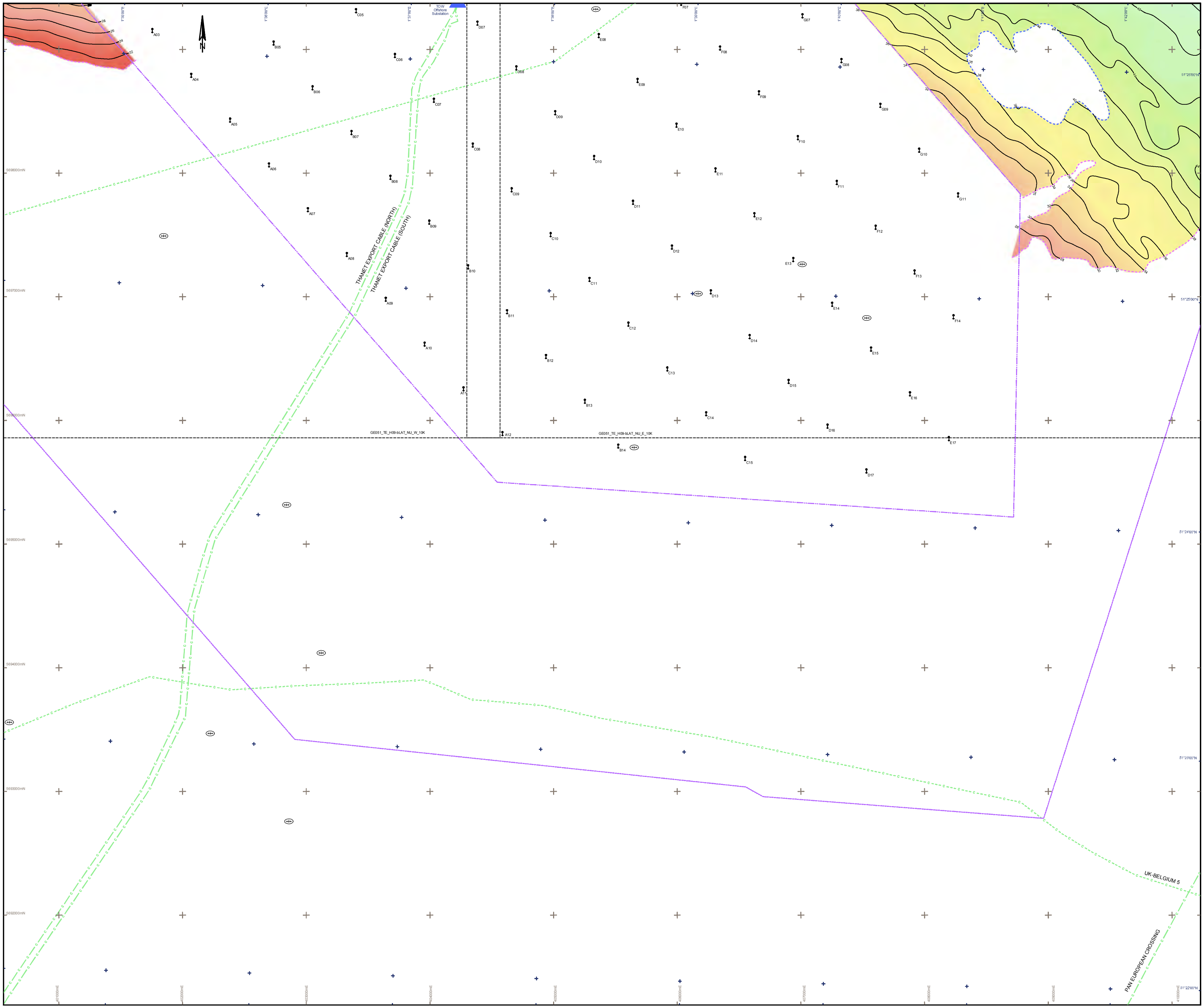
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)
METRES BELOW LAT
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H09-bLAT_NU_W_10K	2 of 3	44



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
═ C ═	EXISTING CABLE ROUTES
—·—·—	WIND FARM BOUNDARY (TOW)
- - - -	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
– – – –	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)

50 ~	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
▬	FAULT AT H09
- - - -	H09 ABSENT
- - - -	H09 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H09 RANGES BETWEEN 20 m AND 72 m bLAT

30.0
40.0
50.0
60.0
70.0

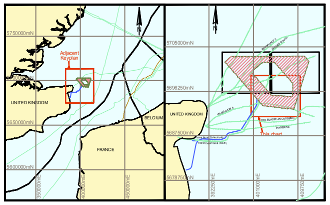
NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)
METRES BELOW LAT
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
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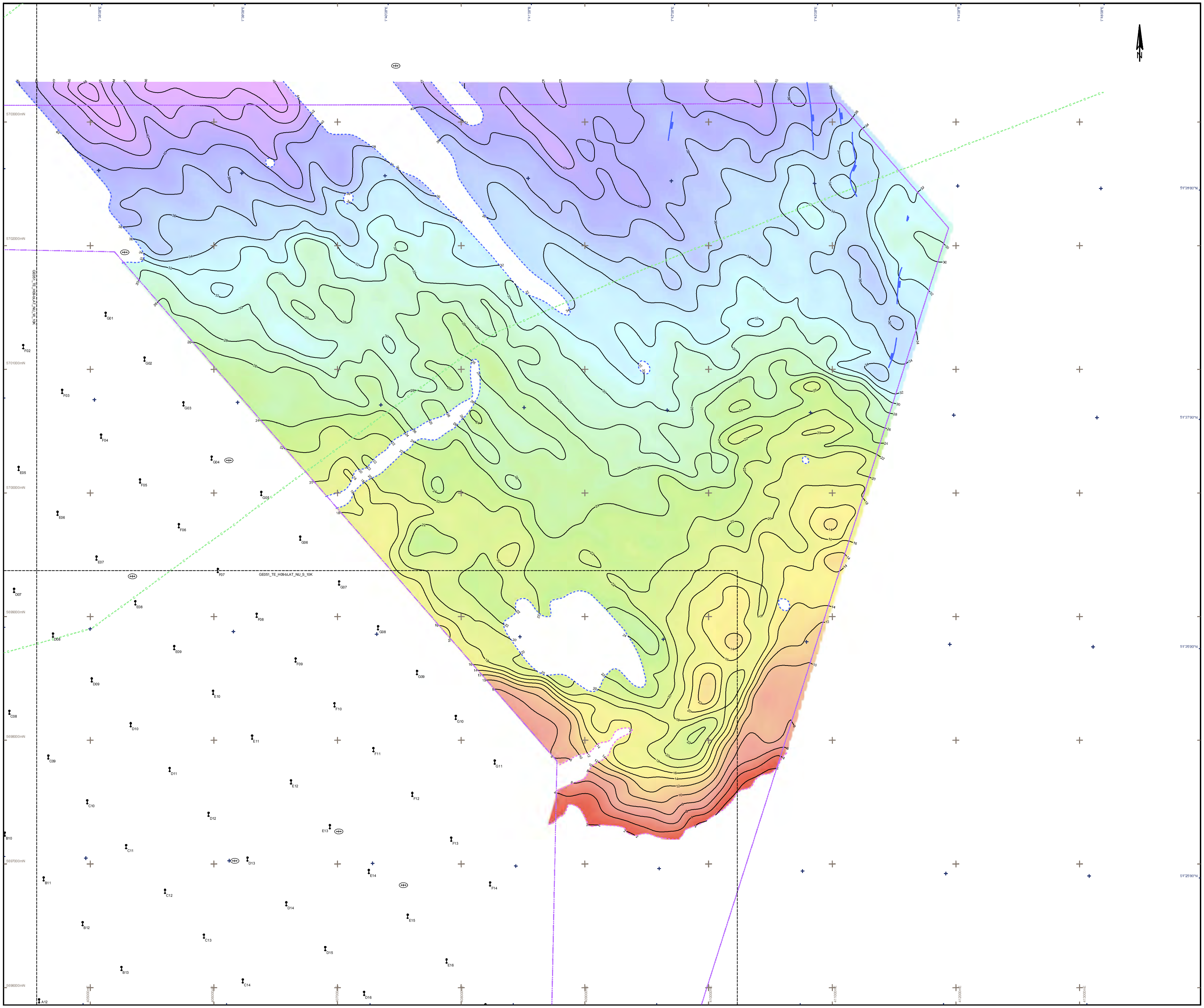
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H09-bLAT_NU_S_10K	3 of 3	45



LEGEND:

GENERAL

+ U.T.M. GRID
+ GEOGRAPHICAL GRID
- - C - - EXISTING CABLE ROUTES
-·-·- WIND FARM BOUNDARY (TOW)
- - - WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - - CHART MATCHLINE
E01 TURBINE LOCATION WITH ID NUMBER (TOW)
(+++) WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)

50 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
FAULT AT H09
- - - H09 ABSENT
- - - H09 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H09 RANGES BETWEEN 1 m AND 49 m bsb

10.0
20.0
30.0
40.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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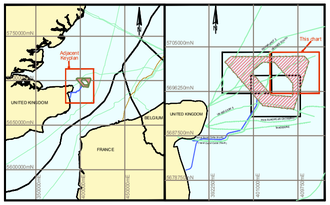

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)
METRES BELOW SEABED
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
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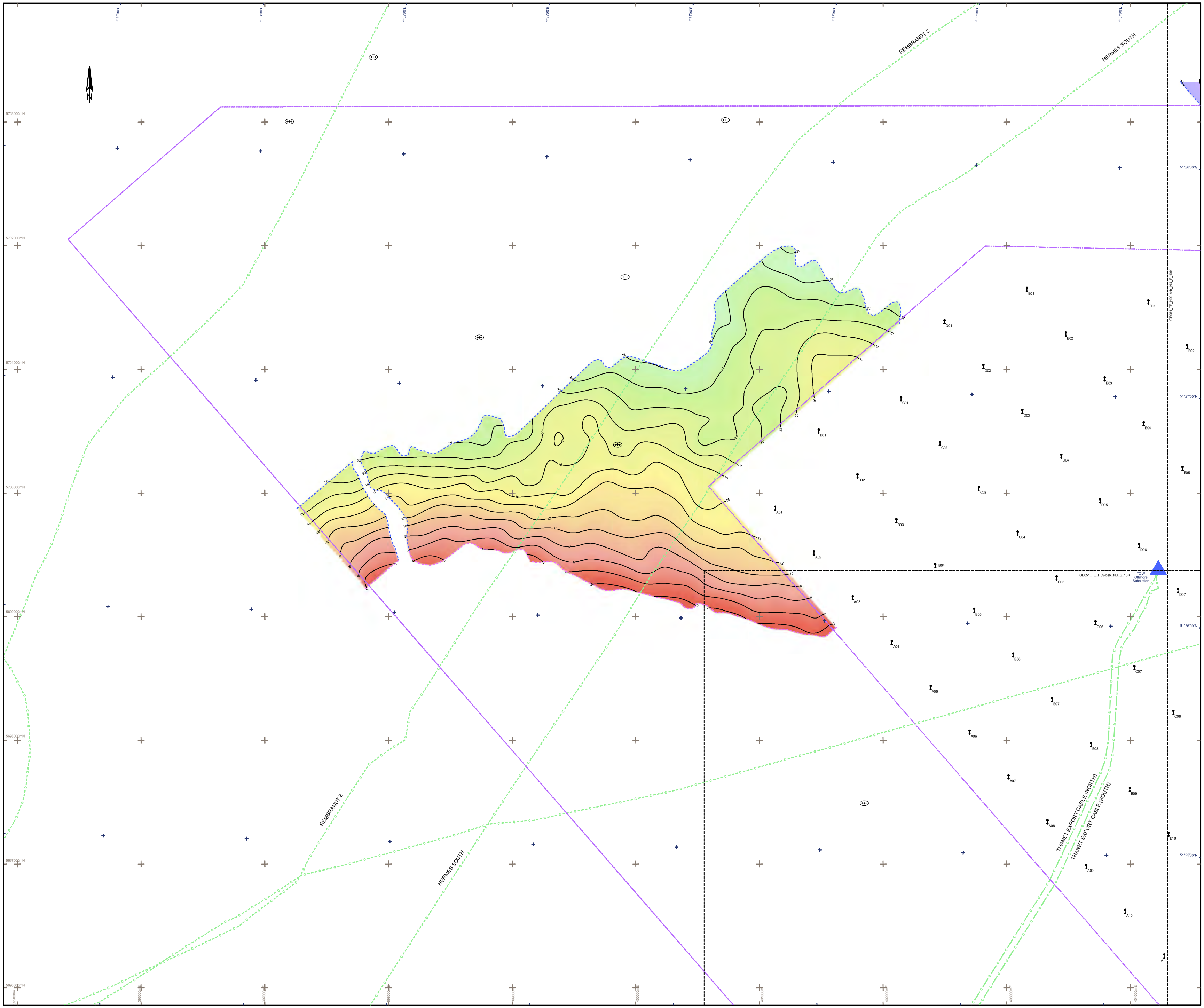
Client Ref: -		Drawing No: GE051_TE_H09-bsb_NU_E_10K	Chart: 1 of 3		Encl: 46	



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
	EXISTING CABLE ROUTES
	WIND FARM BOUNDARY (TOW)
	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)

50	DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
	FAULT AT H09
	H09 ABSENT
	H09 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H09 RANGES BETWEEN 1 m AND 49 m bsb

10.0
20.0
30.0
40.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
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5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
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7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

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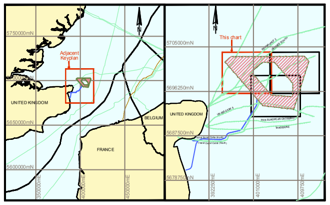
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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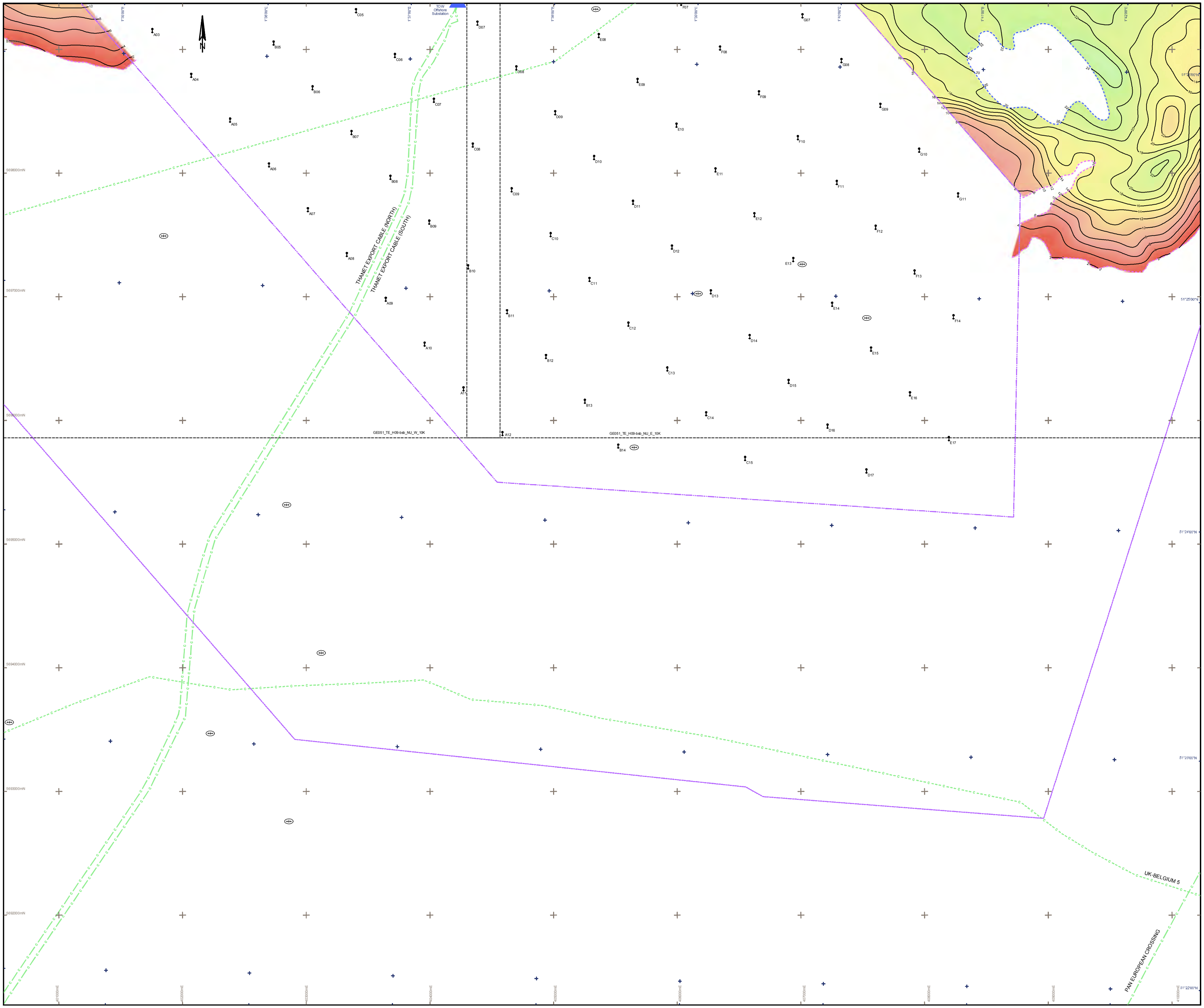
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)
METRES BELOW SEABED
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H09-bsb_NU_W_10K	2 of 3	47



LEGEND:

GENERAL

- + U.T.M. GRID
- + GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)

- 50 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H09
- H09 ABSENT
- H09 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H09 RANGES BETWEEN 1 m AND 49 m bsb

10.0
20.0
30.0
40.0

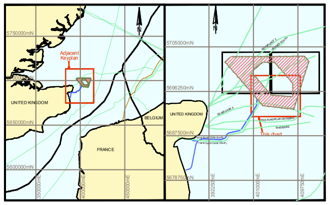
NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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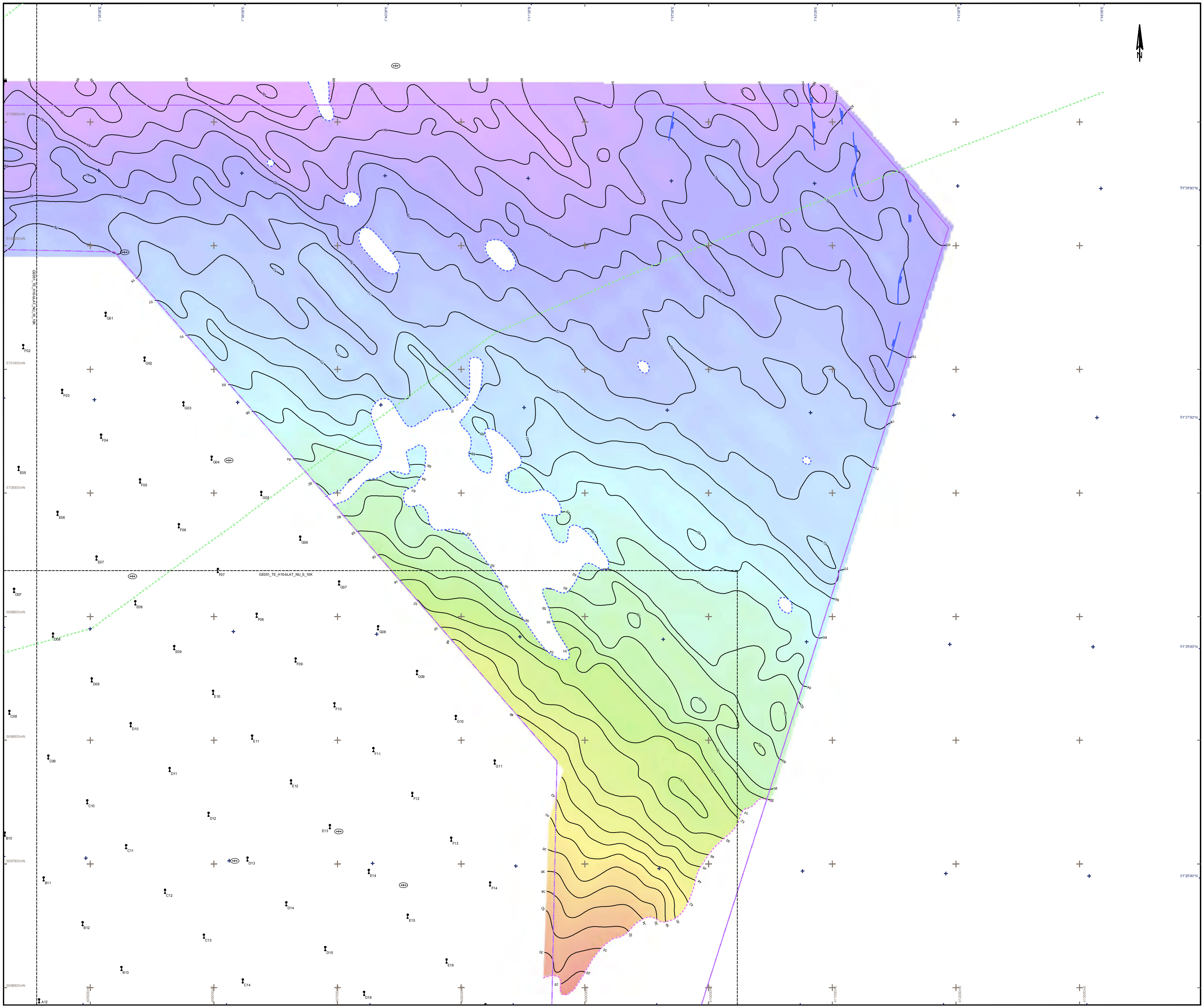
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF WOOLWICH Fm. (HORIZON H09)
METRES BELOW SEABED
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H09-bsb_NU_S_10K	3 of 3	48



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
═	EXISTING CABLE ROUTES
—·—	WIND FARM BOUNDARY (TOW)
----	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
– – –	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF THANET Fm. (HORIZON H10)

50	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
—	FAULT AT H10
- - -	H10 ABSENT
- - -	H10 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H10 RANGES BETWEEN 19 m AND 91 m bLAT

30.0
50.0
70.0
90.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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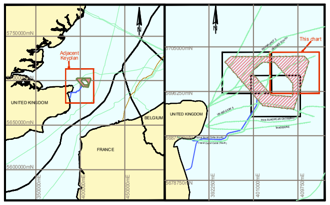

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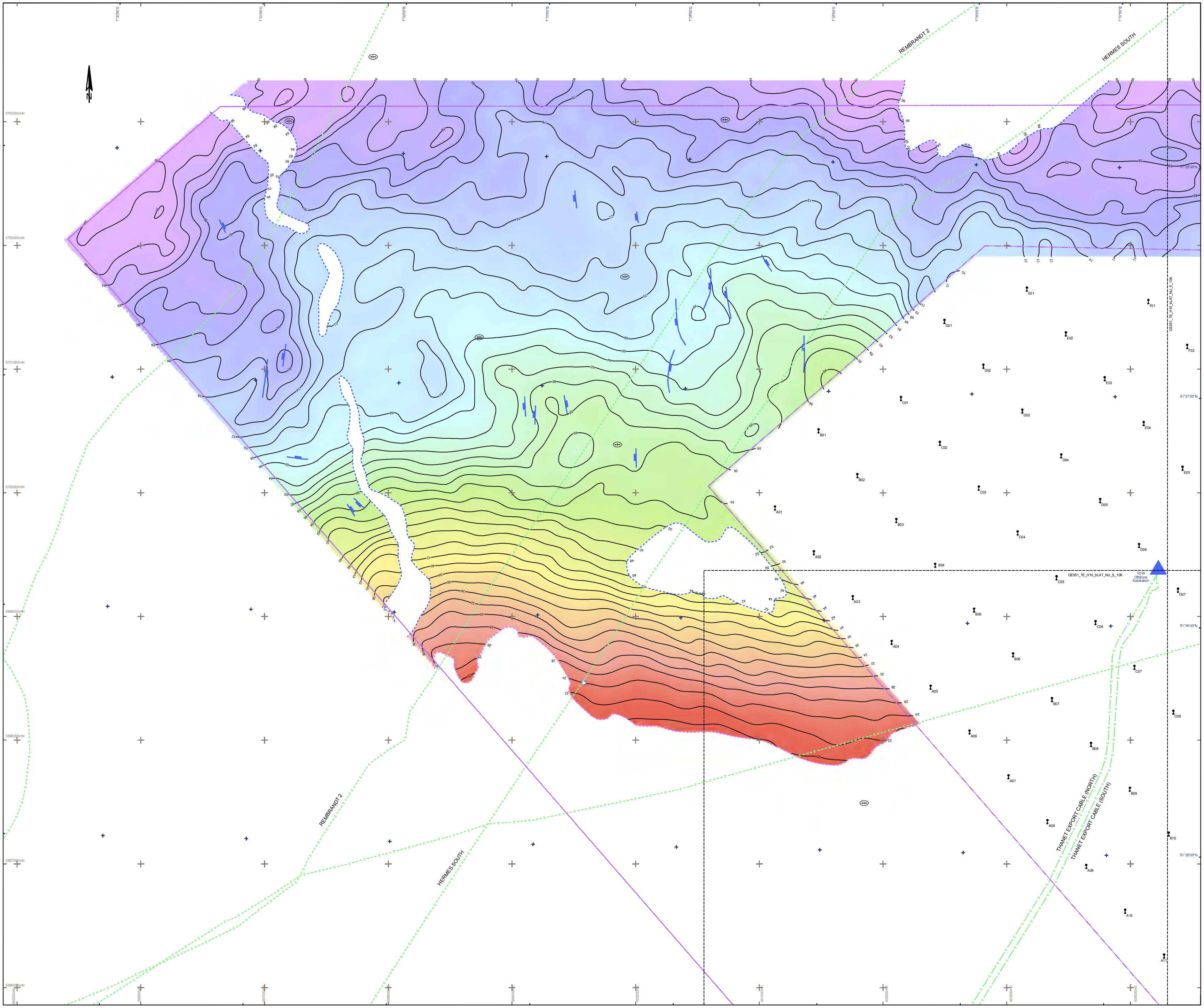
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF THANET Fm. (HORIZON H10)
METRES BELOW LAT
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H10_bLAT_NU_E_10K	1 of 3	49



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
	EXISTING CABLE ROUTES
	WIND FARM BOUNDARY (TOW)
	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF THANET Fm. (HORIZON H10)

50	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
	FAULT AT H10
	H10 ABSENT
	H10 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H10 RANGES BETWEEN 19 m AND 91 m bLAT

30.0
50.0
70.0
90.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
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GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
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Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
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False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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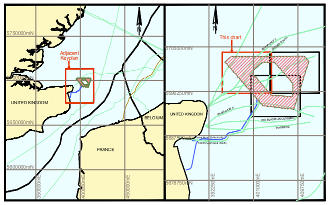

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF THANET Fm. (HORIZON H10)
METRES BELOW LAT
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
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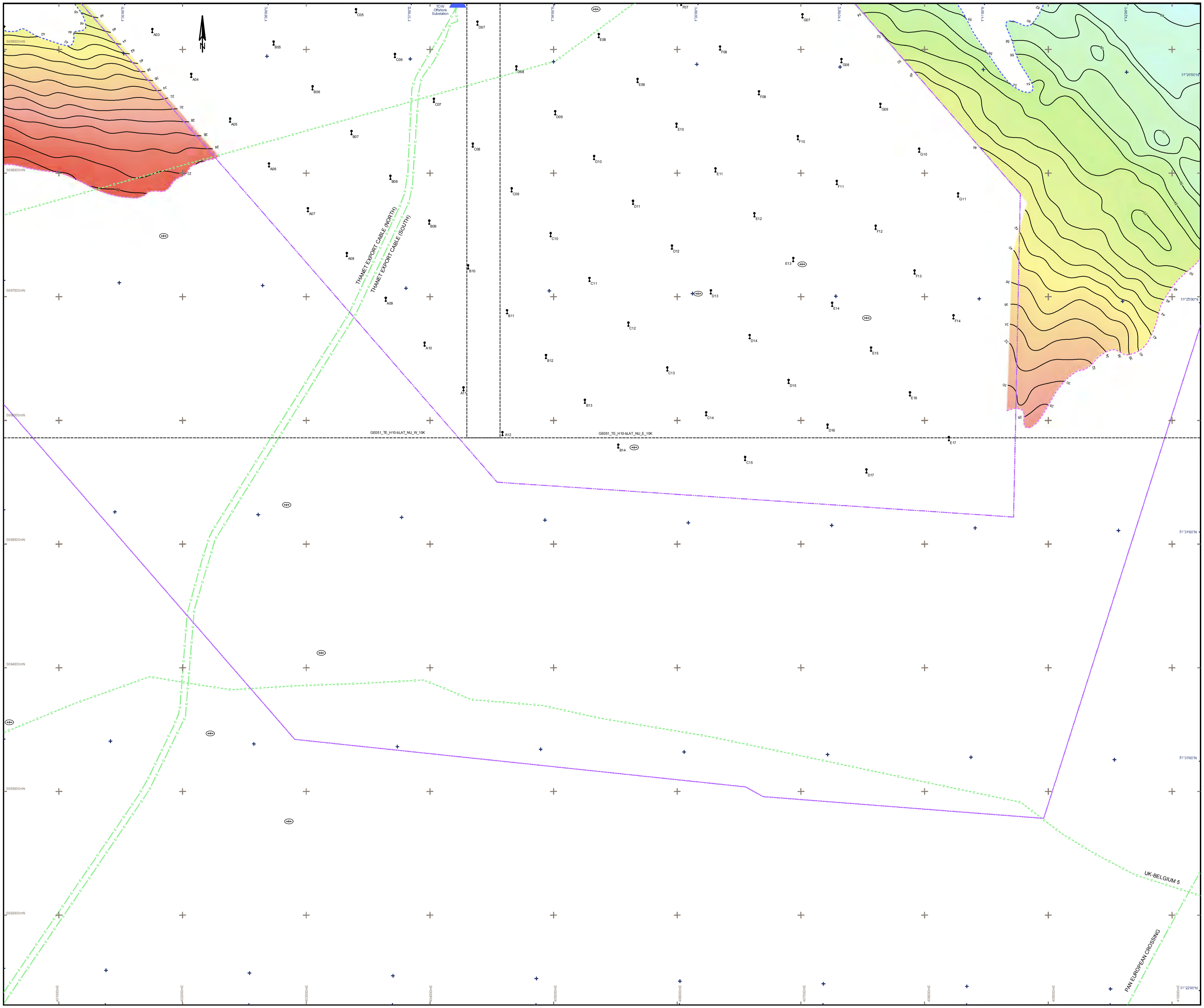
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H10-bLAT_NU_W_10K	2 of 3	50



LEGEND:

GENERAL

- ✛ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF THANET Fm. (HORIZON H10)

- 50 DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H10
- H10 ABSENT
- H10 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H10 RANGES BETWEEN 19 m AND 91 m bLAT

30.0
50.0
70.0
90.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
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GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
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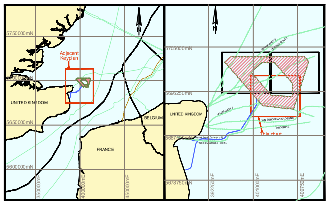
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF THANET Fm. (HORIZON H10)
METRES BELOW LAT
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER | Survey Date: JUL - SEPT 2016 | Project Ref: GE051

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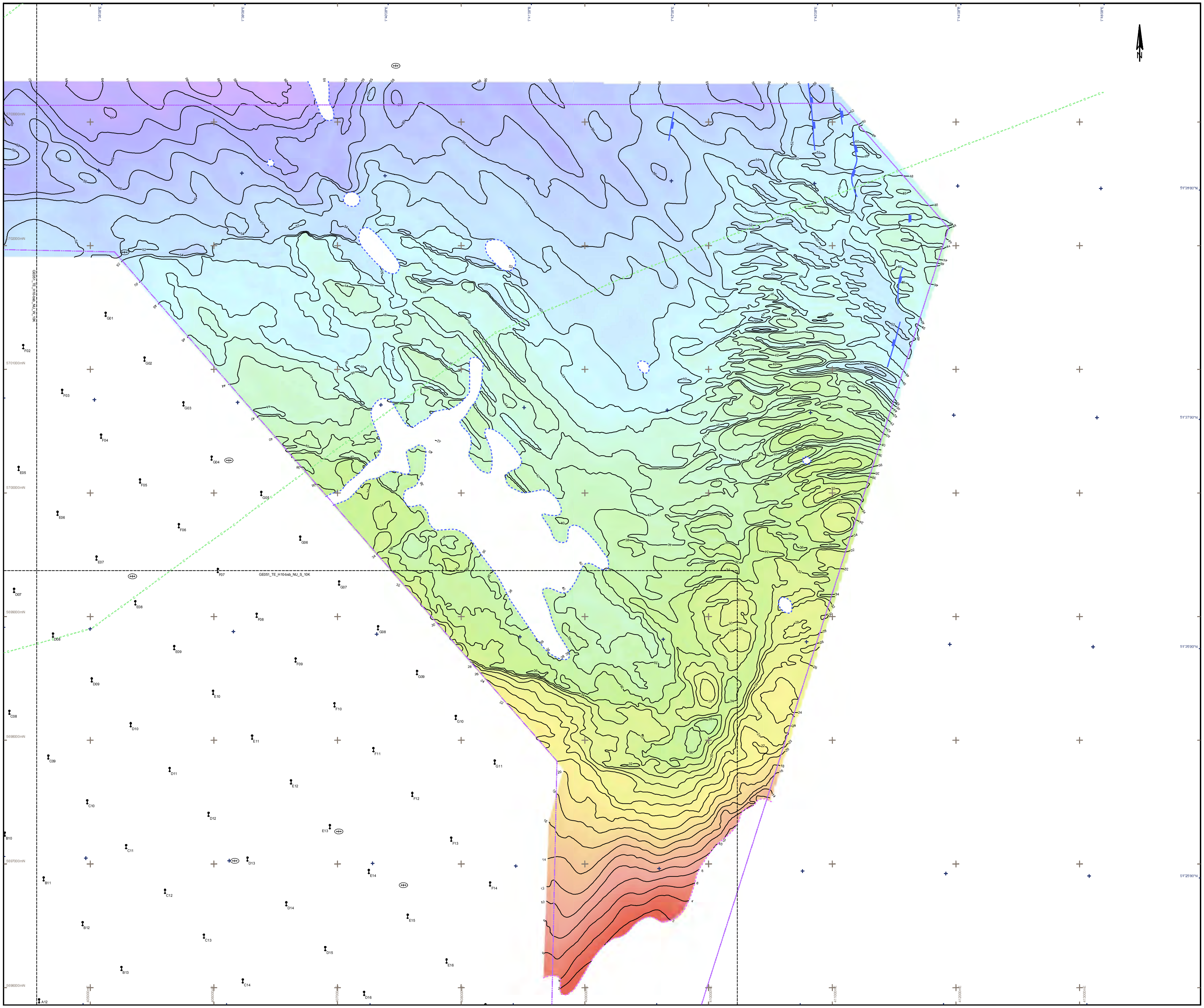

LEGEND:

GENERAL

- ✚ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- - - EXISTING CABLE ROUTES
- -·- WIND FARM BOUNDARY (TOW)
- - - WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - - - CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- ⊕ WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF THANET Fm. (HORIZON H10)

- 50 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H10
- - - H10 ABSENT
- - - H10 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H10 RANGES BETWEEN 0 m AND 74 m bsb

15.0
35.0
55.0
75.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
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VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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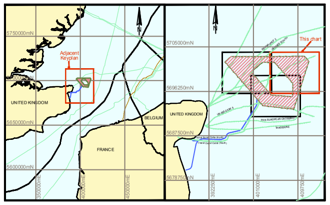

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA

THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF THANET Fm. (HORIZON H10)
METRES BELOW SEABED
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
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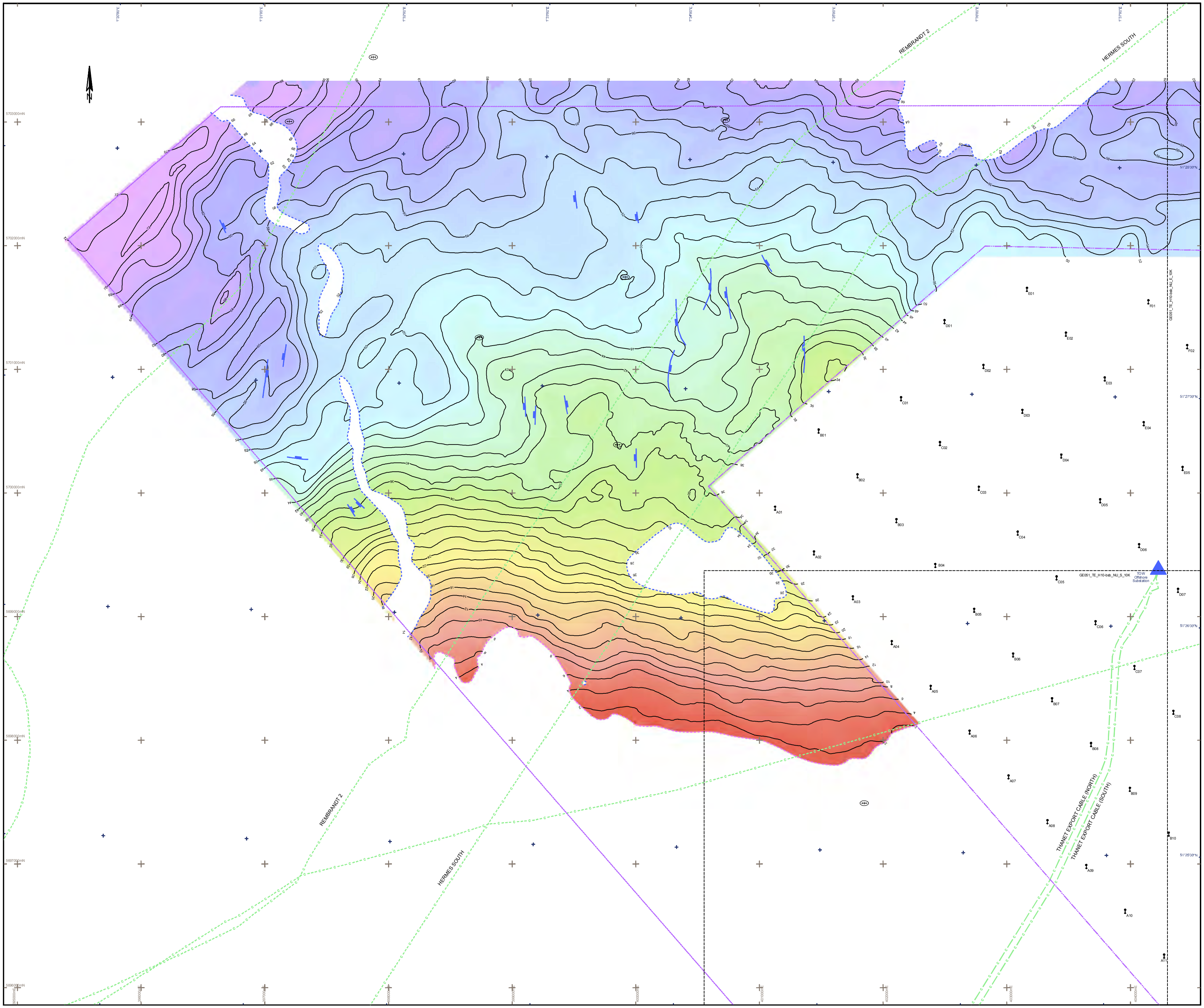
-	GE051_TE_H10-bsb_NU_E_10K	1 of 3	52


REMBRANDT 2
HERMES SOUTH
THANET EXPORT CABLE (NORTH)
THANET EXPORT CABLE (SOUTH)
GE051_TE_H10-bsb_NU_E_10K
GE051_TE_H10-bsb_NU_S_10K
TOW Offshore Substation
51°28'00"N
51°27'00"N
51°26'00"N
51°25'00"N
N

LEGEND:

GENERAL

- ✚ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF THANET Fm. (HORIZON H10)

- 50 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H10
- H10 ABSENT
- H10 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H10 RANGES BETWEEN 0 m AND 74 m bsb

15.0
35.0
55.0
75.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
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7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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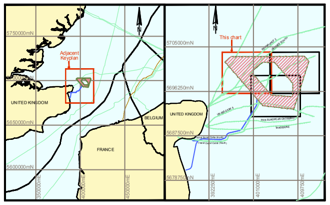

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Tel: +31 70 311 1800, Fax: +31 70 311 1838, Email: fsbvinfo@fugro.com

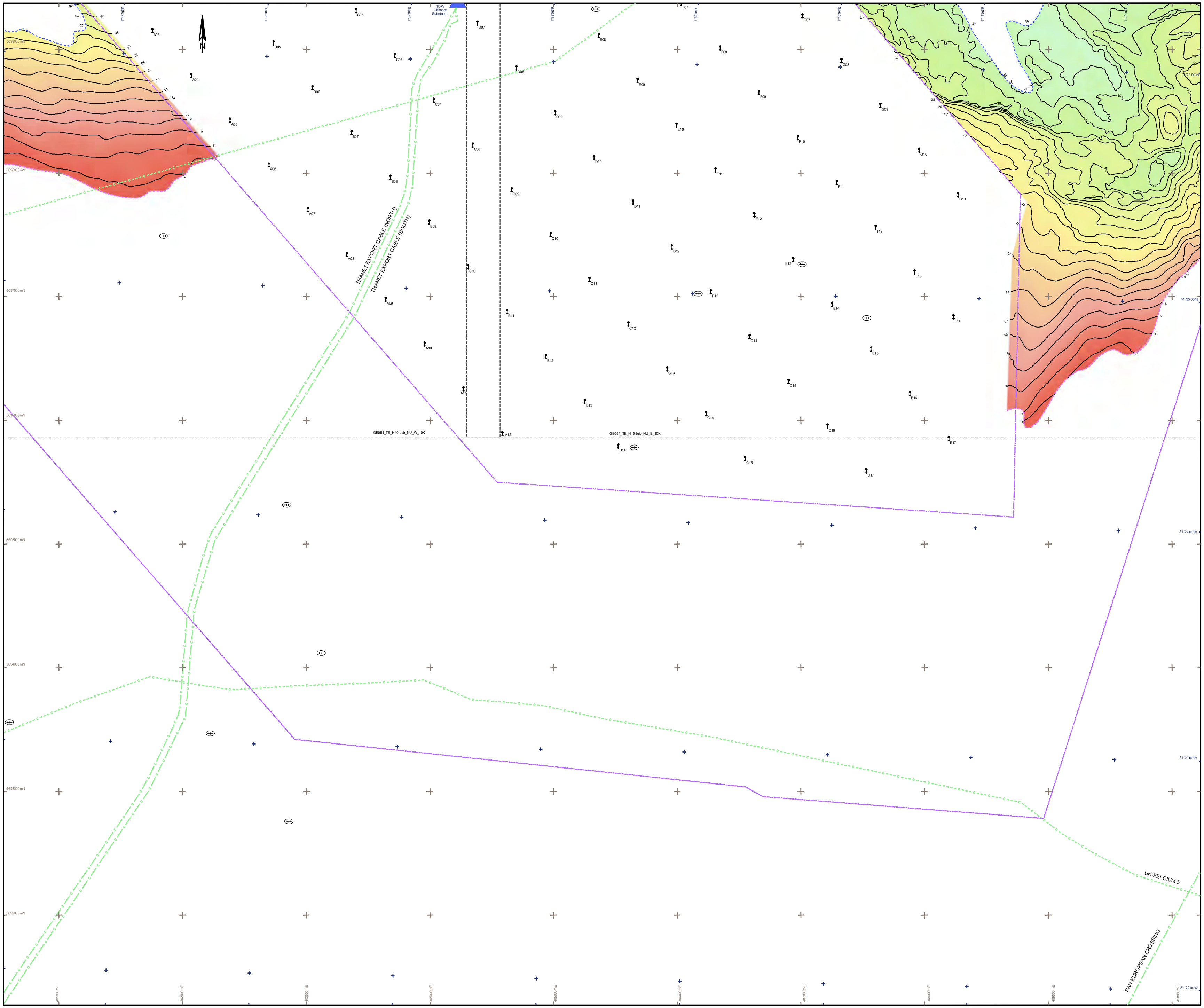
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF THANET Fm. (HORIZON H10)
METRES BELOW SEABED
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H10-bsb_NU_W_10K	2 of 3	53



LEGEND:

GENERAL

+	U.T.M. GRID
+	GEOGRAPHICAL GRID
	EXISTING CABLE ROUTES
	WIND FARM BOUNDARY (TOW)
	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF THANET Fm. (HORIZON H10)

50	DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
	FAULT AT H10
	H10 ABSENT
	H10 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H10 RANGES BETWEEN 0 m AND 74 m bsb

15.0
35.0
55.0
75.0

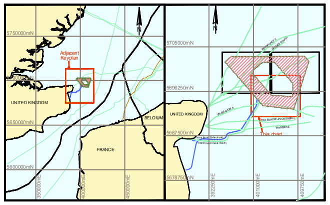
NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF THANET Fm. (HORIZON H10)
METRES BELOW SEABED
SOUTH

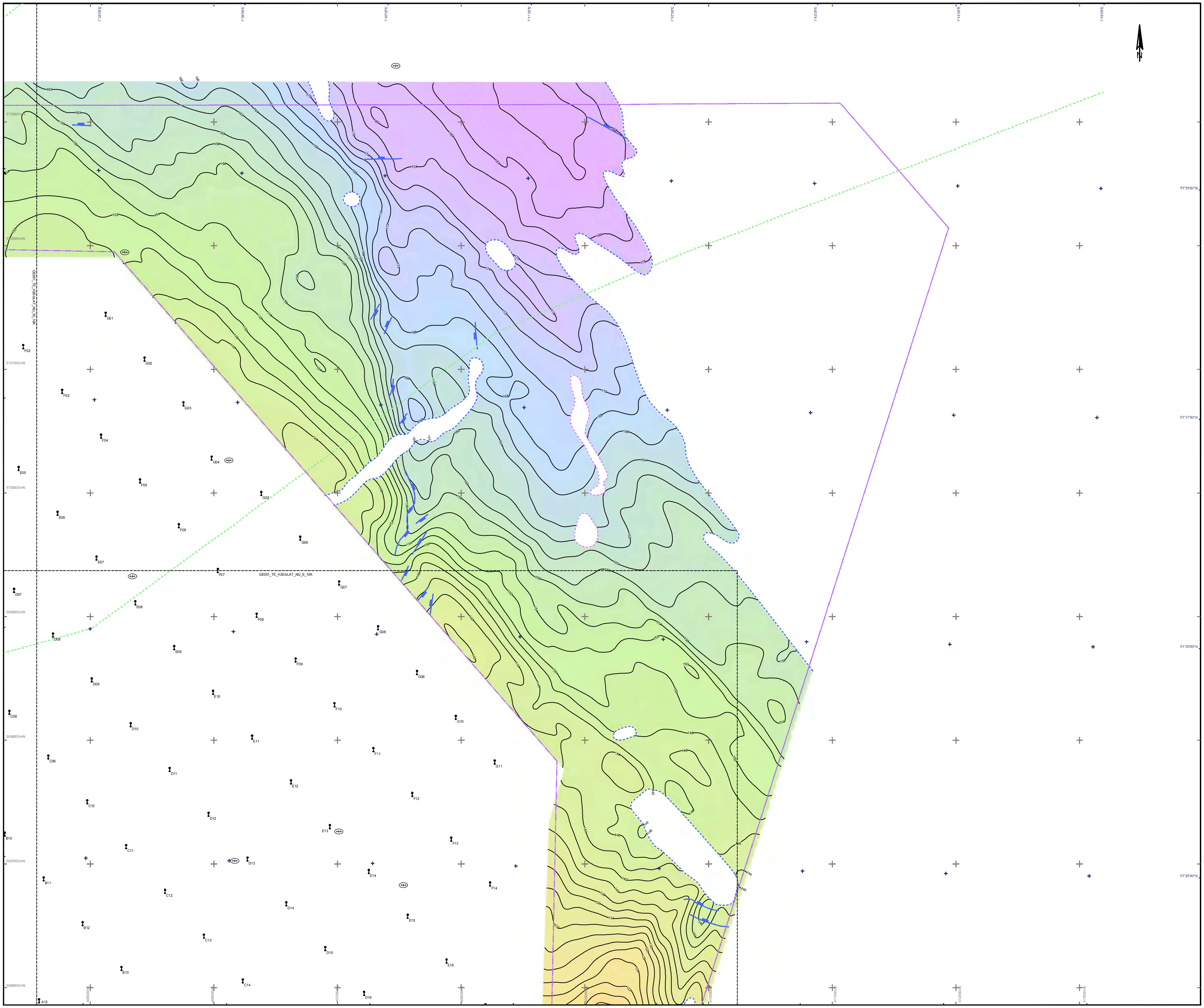
SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER | Survey Date: JUL - SEPT 2016 | Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H10-bsb_NU_S_10K	3 of 3	54



LEGEND:

GENERAL

- + U.T.M. GRID
- + GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)

- 150 DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H20
- H20 TRUNCATED BY CHANNEL
- H20 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H20 RANGES BETWEEN 84 m AND 185 m bLAT

85.0
110.0
135.0
160.0
185.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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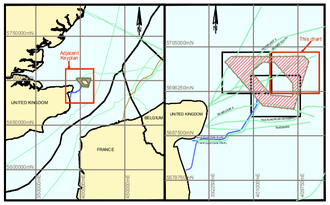

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)
METRES BELOW LAT
EAST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
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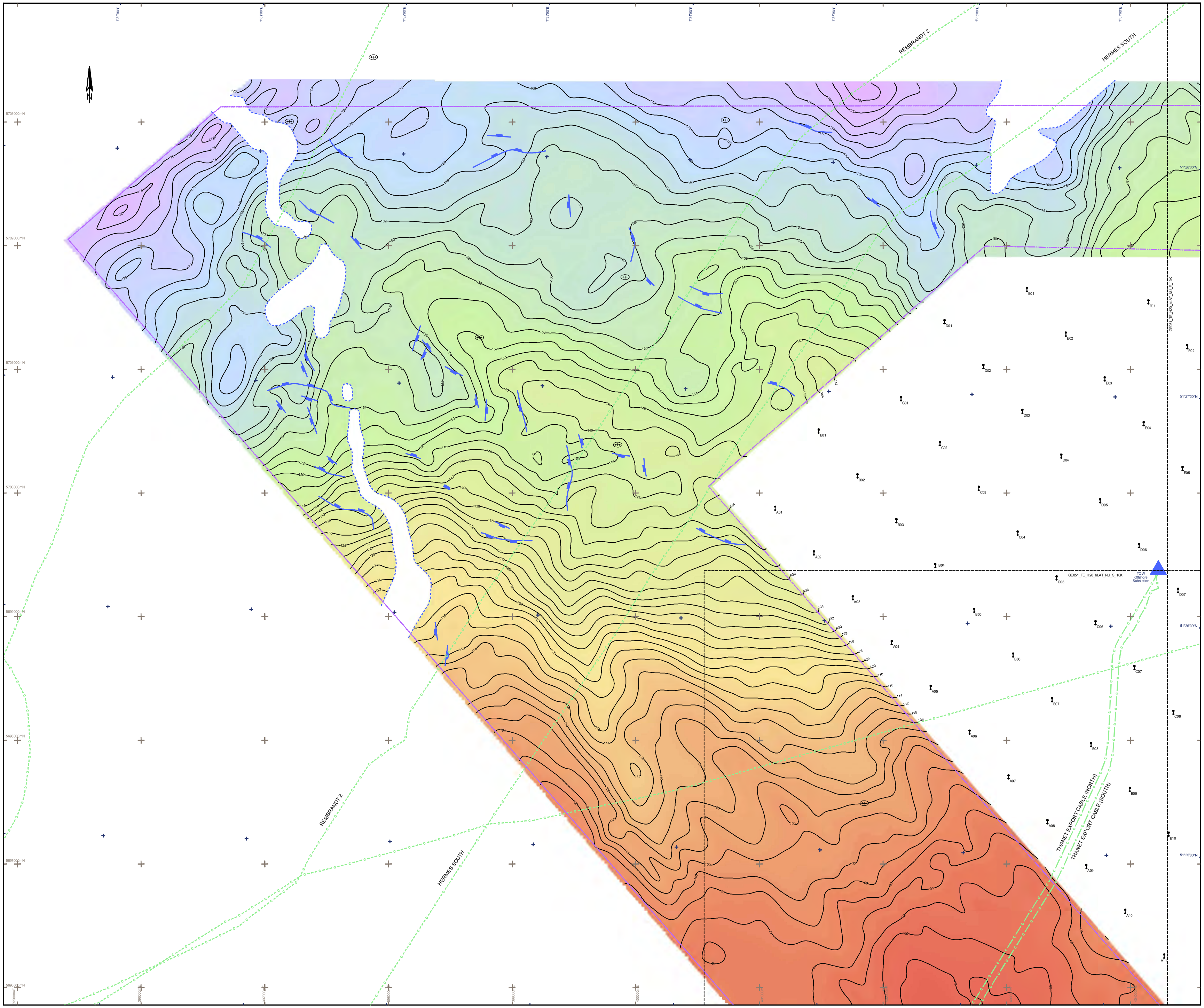
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H20_bLAT_NU_E_10K	1 of 3	55



LEGEND:

GENERAL

- ✛ U.T.M. GRID
- ✛ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)

- 150 DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H20
- H20 TRUNCATED BY CHANNEL
- H20 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H20 RANGES BETWEEN 84 m AND 185 m bLAT

85.0
110.0
135.0
160.0
185.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
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7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
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False Northing	0mN
Scale Factor at CM	0.9996
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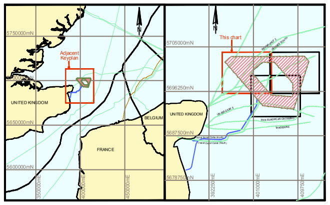
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)
METRES BELOW LAT
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
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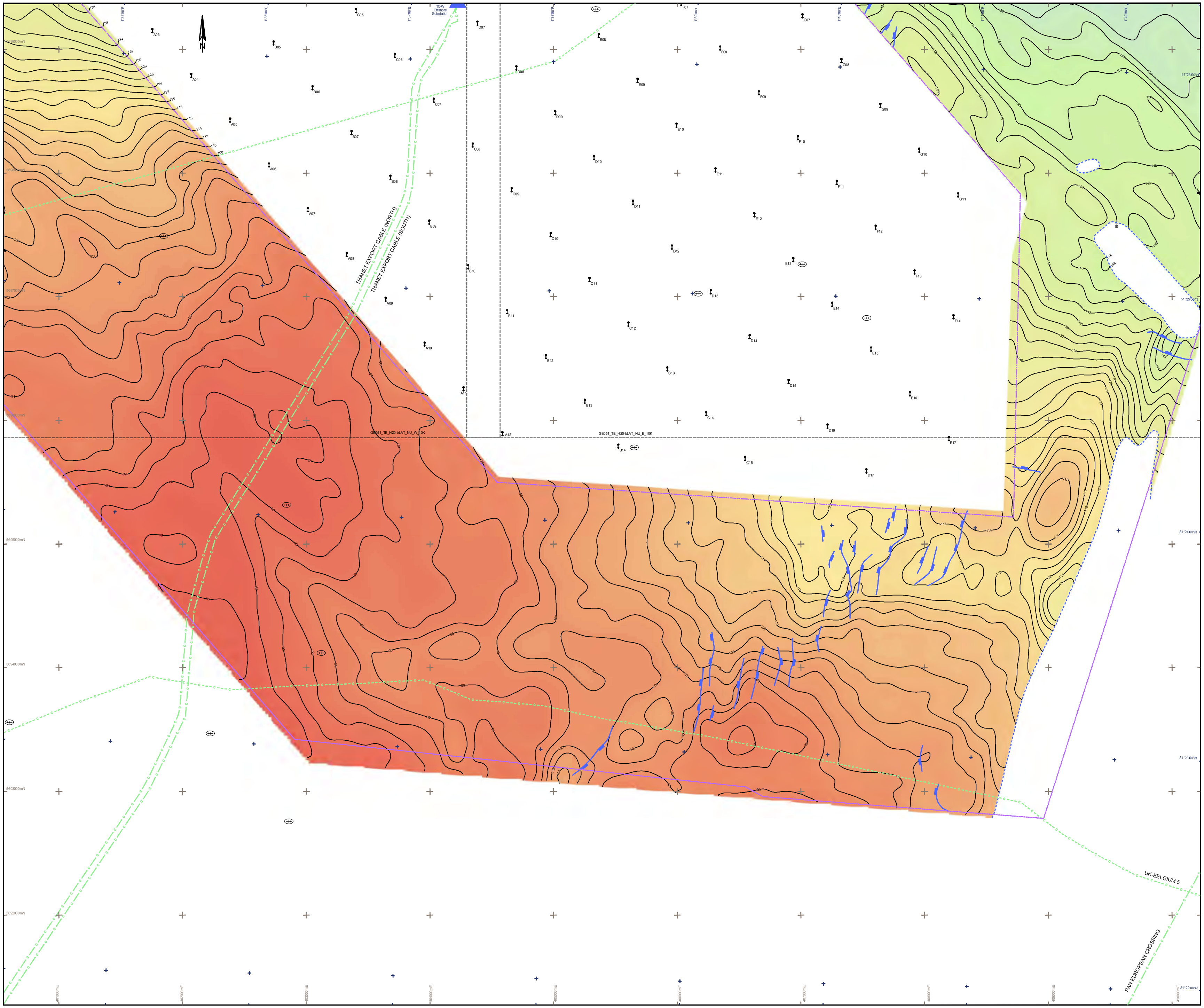
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H20-bLAT_NU_W_10K	2 of 3	56



LEGEND:

GENERAL

- + U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)

- 150 DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H20
- H20 TRUNCATED BY CHANNEL
- H20 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H20 RANGES BETWEEN 84 m AND 185 m bLAT

85.0
110.0
135.0
160.0
185.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
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7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
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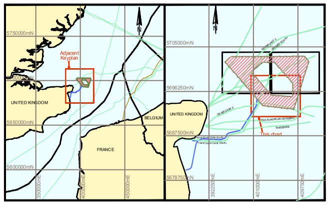
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)
METRES BELOW LAT
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
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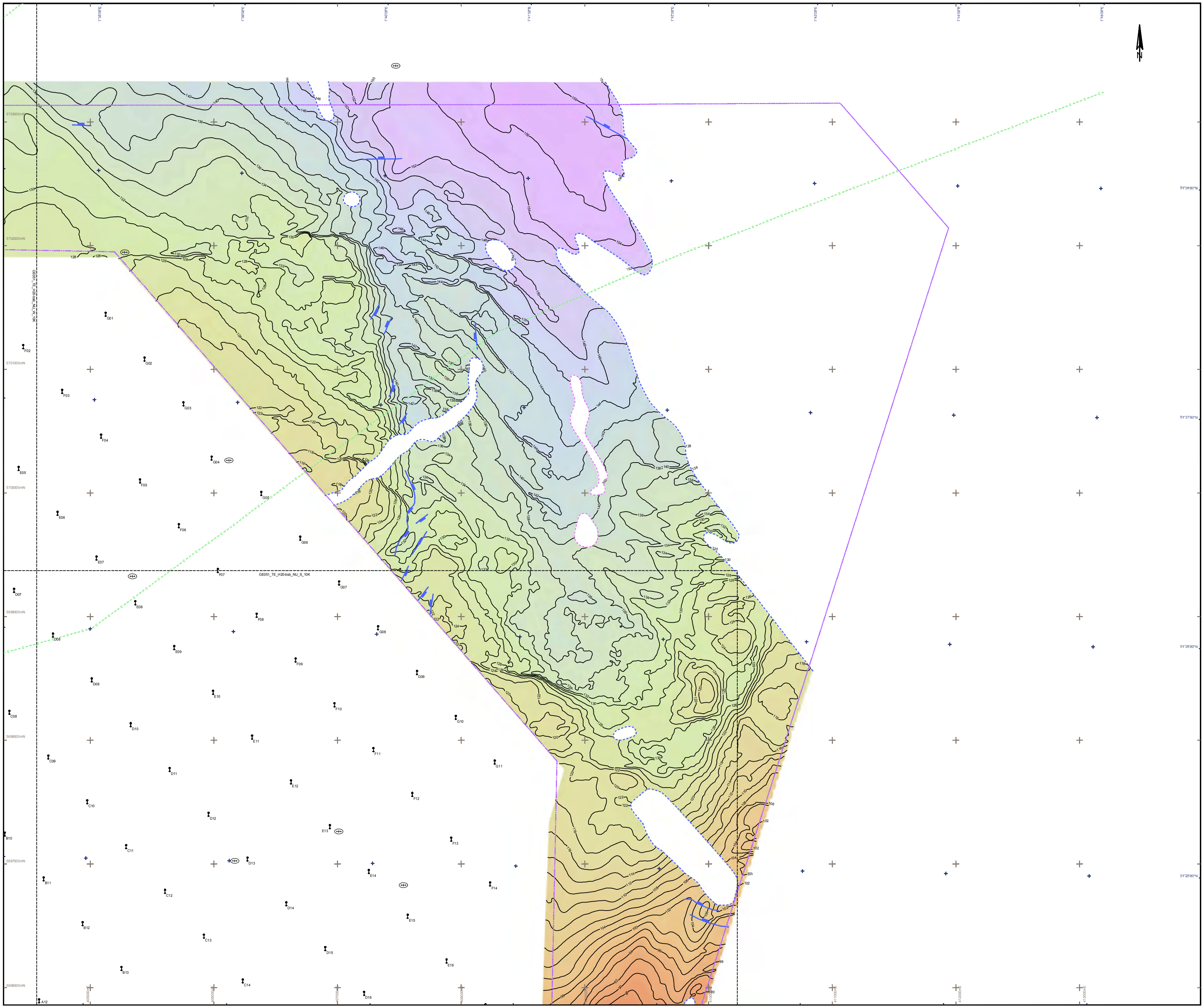
Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H20-bLAT_NU_S_10K	3 of 3	57



LEGEND:

GENERAL

- + U.T.M. GRID
- + GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)

- 140 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H20
- H20 TRUNCATED BY CHANNEL
- H20 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H20 RANGES BETWEEN 68 m AND 164 m bsb

80.0
100.0
120.0
140.0
160.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
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VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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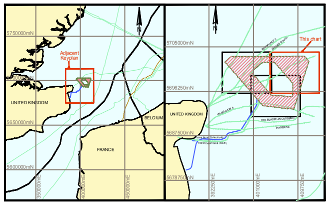

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)
METRES BELOW SEABED
EAST

SCALE 1 : 10000 at A0
0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER	Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:

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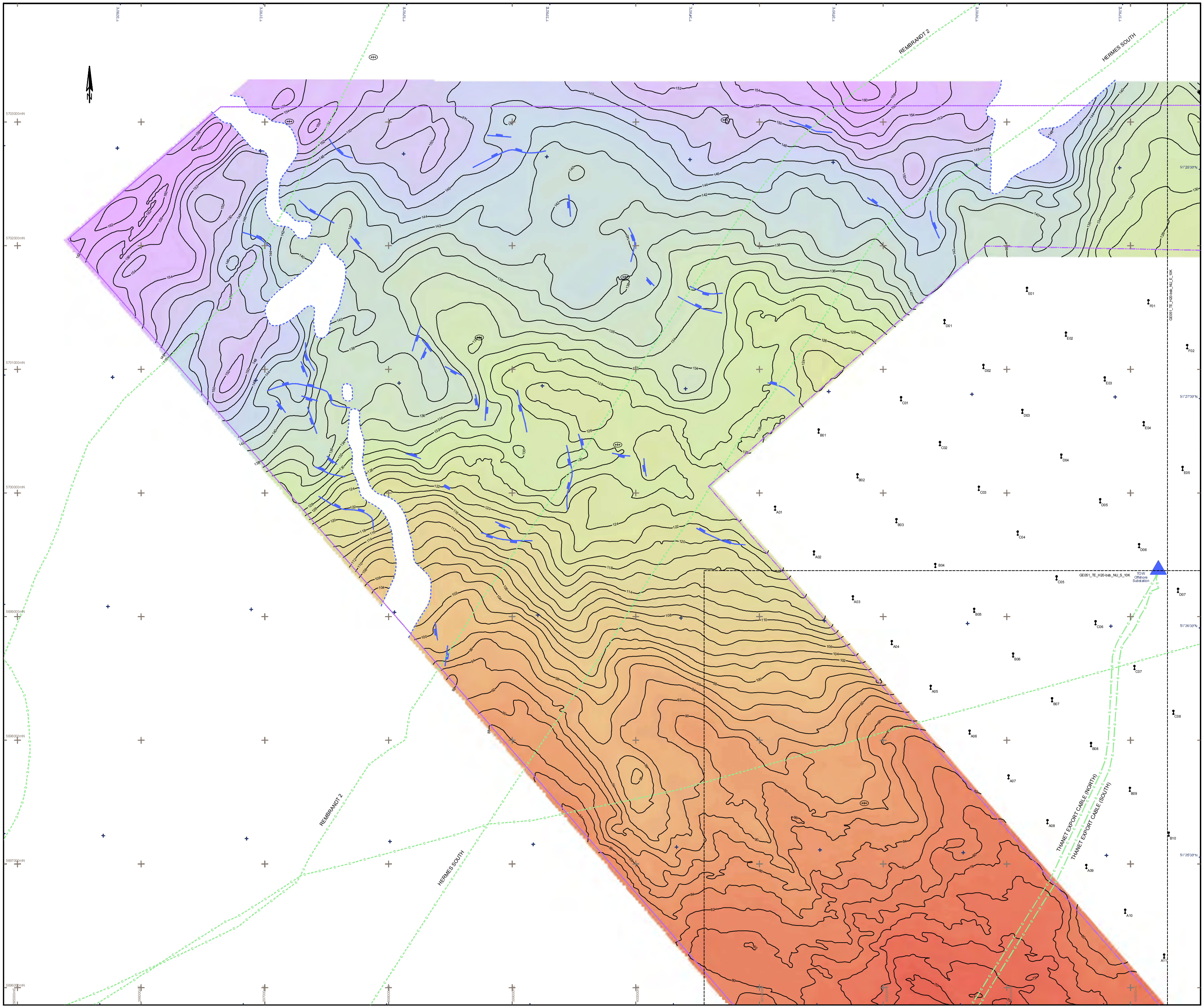

LEGEND:

GENERAL

- + U.T.M. GRID
- + GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)

- 140 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H20
- H20 TRUNCATED BY CHANNEL
- H20 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H20 RANGES BETWEEN 68 m AND 164 m bsb

80.0
100.0
120.0
140.0
160.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
4. GRIDDING ALGORITHM: MINIMUM CURVATURE. GRIDDING PARAMETER: CELL SIZE 25X25 m, SMOOTHNESS 11. CONTOUR PARAMETERS: THRESHOLD 30, CONTOUR INTERVAL 2 m.
5. TWO-WAY TIME UHR DATA WAS CONVERTED TO DEPTH USING A SMOOTHED VELOCITY FIELD DERIVED FROM PICKED RMS VELOCITIES. CALCULATED DEPTHS ARE CONSIDERED TO BE ACCURATE TO +/- 5%.
6. SEISMIC INTERPRETATION OF THE LOCAL STRATIGRAPHY WAS CORRELATED WITH BGS REPORT IN THAMES ESTUARY.
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)

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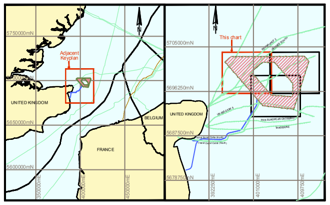

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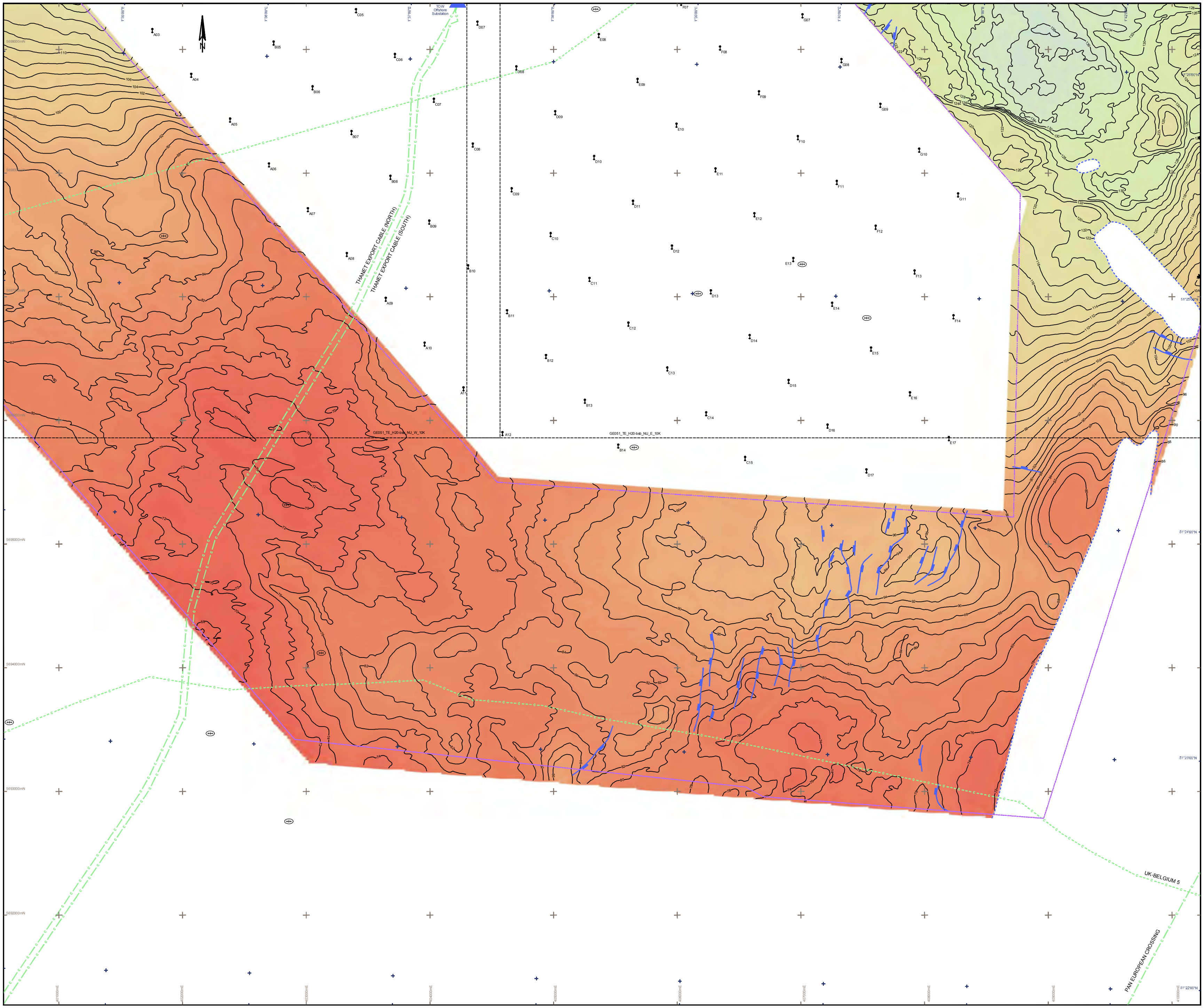
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)
METRES BELOW SEABED
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H20-bsb_NU_W_10K	2 of 3	59


THANET EXPORT CABLE (NORTH)
THANET EXPORT CABLE (SOUTH)
TOW Offshore Substation
UK-BELGIUM 5
PAN EUROPEAN CROSSING
GE051_TE_H20-bsb_NU_W_10K
GE051_TE_H20-bsb_NU_E_10K
N

LEGEND:

GENERAL

- ✚ U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)

- 140 DEPTH IN METRES BELOW SEABED (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H20
- H20 TRUNCATED BY CHANNEL
- H20 NOT WELL DEFINED

DEPTH IN METRES BELOW SEABED
THE DEPTH OF H20 RANGES BETWEEN 68 m AND 164 m bsb

80.0
100.0
120.0
140.0
160.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS ARE BELOW SEABED.
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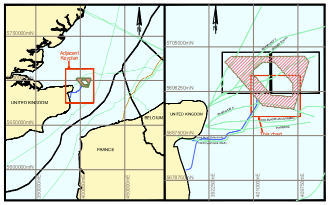
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM	
GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID Semi-Major Axis Inverse Flattening	GRS 1980 6,378,137.000 298.257 222 101
PROJECTION Central Meridian (CM) Latitude of Origin False Easting False Northing Scale Factor at CM	ETRS89 / UTM zone 31N 03°00'00" E 00°00'00" N 500,000mE 0mN 0.9996
DATUM TRANSFORMATION Source	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016) EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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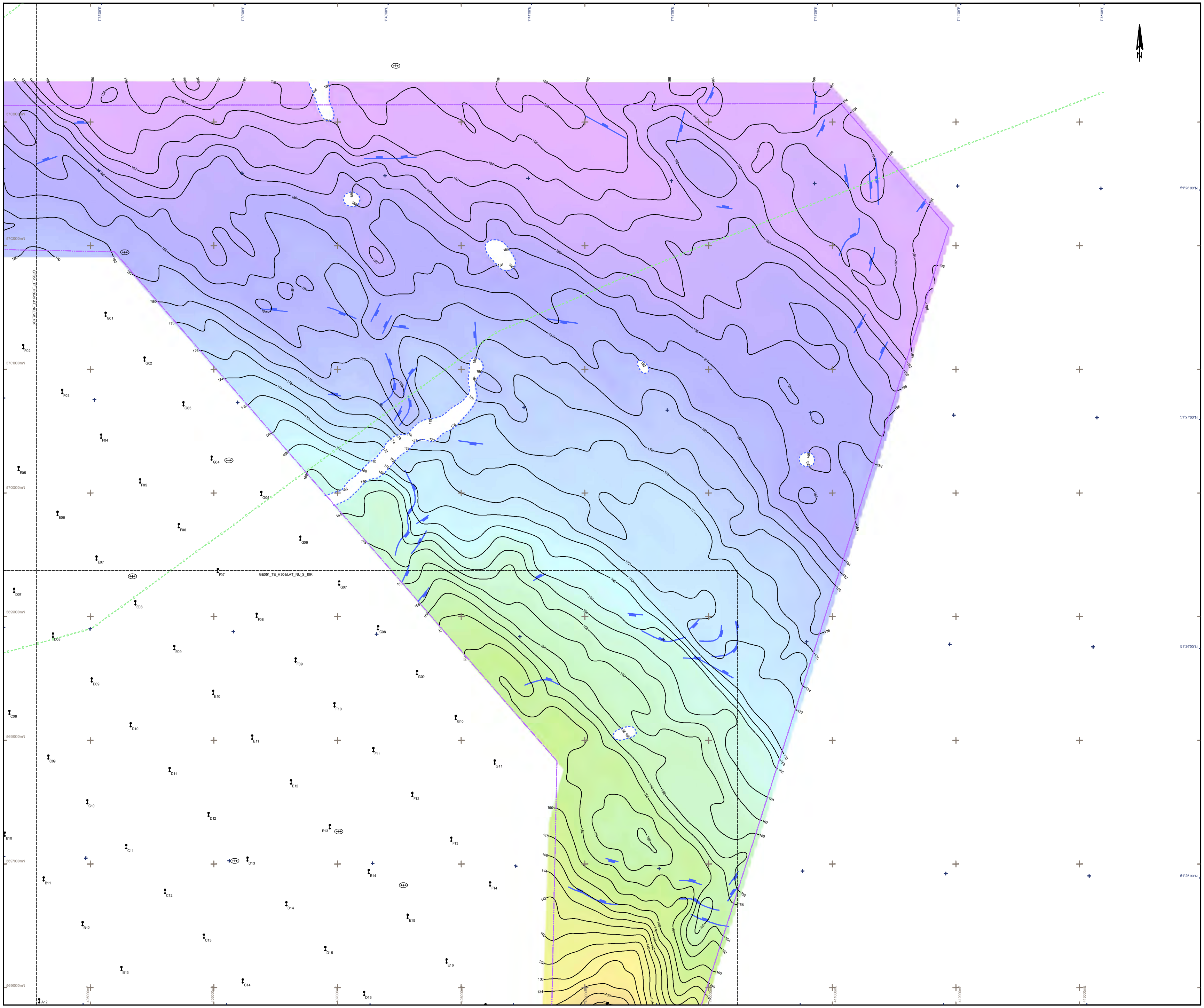
GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF EROSIONAL SURFACE (HORIZON H20)
METRES BELOW SEABED
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H20-bsb_NU_S_10K	3 of 3	60



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
- - -	EXISTING CABLE ROUTES
—·—·	WIND FARM BOUNDARY (TOW)
······	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- - -	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
⊕	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF UPPER CHALK Fm. (HORIZON H30)

150	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
—	FAULT AT H30
- - -	H30 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H30 RANGES BETWEEN 107 m AND 200 m bLAT

125.0
150.0
175.0
200.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
3. DUE TO THE SURVEY LINE SPACING AND THE GREAT LATERAL VARIATION, THE DEPTH VALUES BETWEEN LINES WERE INTERPOLATED (LOW CONFIDENCE).
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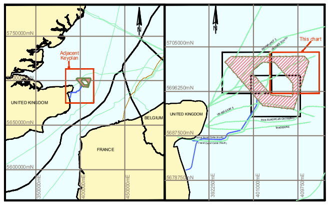
7. BACKGROUND INFORMATION IS EXTRACTED FROM ENC AND ADMIRALTY CHARTS.

GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

GEODETIC DATUM	European Terrestrial Reference System 1989
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG
	dX=+0.05376 dY=+0.05096 dZ=-0.08847
	rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA

THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF UPPER CHALK Fm. (HORIZON H30)
METRES BELOW LAT
EAST

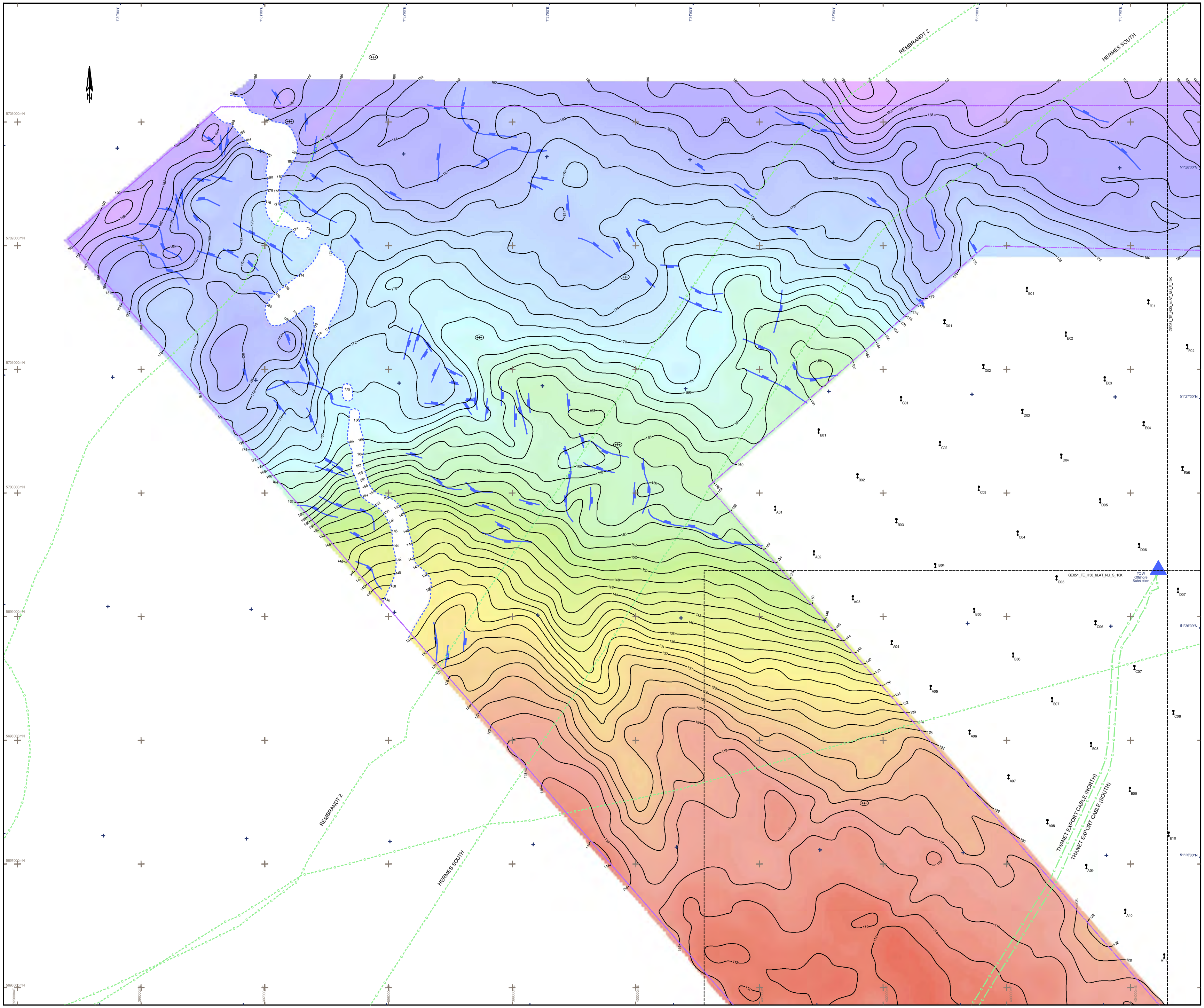
SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER | Survey Date: JUL - SEPT 2016 | Project Ref: GE051

Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
0	03/04/2017	Final Issue	MvL / TW	RB / MS	VMN	PPL

Client Ref:	Drawing No:	Chart:	Encl:
-	GE051_TE_H30_bLAT_NU_E_10K	1 of 3	61



LEGEND:

GENERAL

+	U.T.M. GRID
✚	GEOGRAPHICAL GRID
	EXISTING CABLE ROUTES
	WIND FARM BOUNDARY (TOW)
	WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
	CHART MATCHLINE
E01	TURBINE LOCATION WITH ID NUMBER (TOW)
	WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF UPPER CHALK Fm. (HORIZON H30)

150	DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
	FAULT AT H30
	H30 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H30 RANGES BETWEEN 107 m AND 200 m bLAT

125.0
150.0
175.0
200.0

NOTES:

1. INTERPRETATION BASED ON UHR SEISMIC DATA.
2. ALL DEPTHS REDUCED TO LOWEST ASTRONOMICAL TIDE.
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GEODETIC PARAMETERS:

HORIZONTAL COORDINATE SYSTEM

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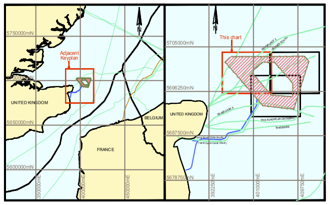
Inverse Flattening	298.257 222 101
PROJECTION	ETRS89 / UTM zone 31N
Central Meridian (CM)	03°00'00" E
Latitude of Origin	00°00'00" N
False Easting	500,000mE
False Northing	0mN
Scale Factor at CM	0.9996
DATUM TRANSFORMATION	ITRF2008 to ETRS89 for Epoch 2016. 647540984 (25 August 2016)
Source	EPSG dX=+0.05376 dY=+0.05096 dZ=-0.08847 rX=-0.002239" rY=-0.013547" rZ=+0.021897" Scale=+0.0026718ppm
VERTICAL DATUM	LOWEST ASTRONOMICAL TIDE (LAT)



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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA

THANET EXTENSION OFFSHORE WIND FARM

DEPTH TO BASE OF UPPER CHALK Fm. (HORIZON H30)
METRES BELOW LAT
WEST

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
Issue No:	Date:	Description:	Interpr:	Drawn:	Chkd:	Appr:
1	25/11/2016	Issue for Approval	MvL / TW	RB / MS	VMN	PPL
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Client Ref:	Drawing No:	Chart:	Encl:
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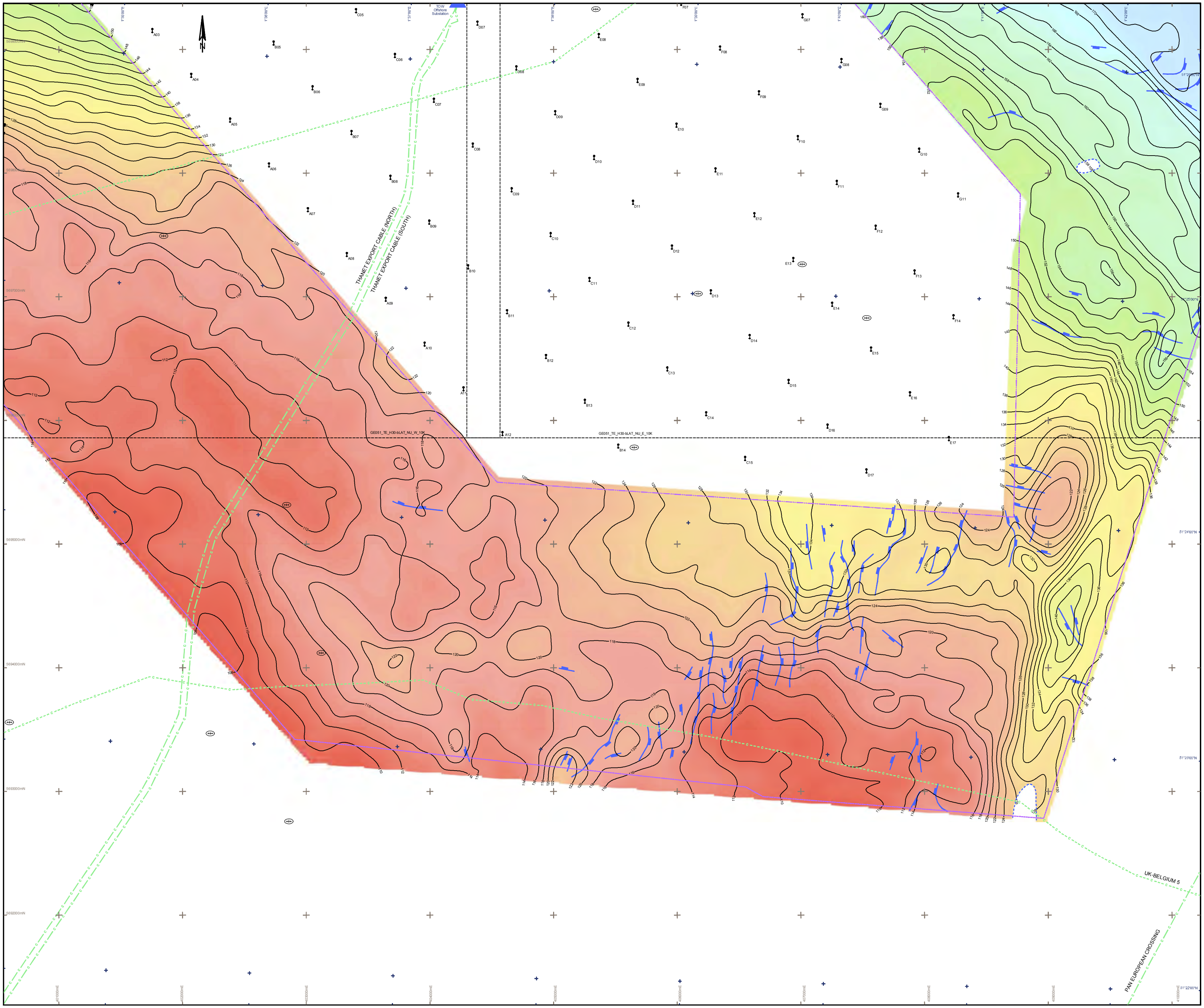
THANET EXPORT CABLE (NORTH)
THANET EXPORT CABLE (SOUTH)
UK-BELGIUM 5
PAN EUROPEAN CROSSING
TOW Offshore Substation
GE051_TE_H30-bLAT_NU_W_10K
GE051_TE_H30-bLAT_NU_E_10K

LEGEND:

GENERAL

- + U.T.M. GRID
- ✚ GEOGRAPHICAL GRID
- EXISTING CABLE ROUTES
- WIND FARM BOUNDARY (TOW)
- WIND FARM BOUNDARY (TEOW), BASED ON SURVEY LINE PLAN
- CHART MATCHLINE
- E01 TURBINE LOCATION WITH ID NUMBER (TOW)
- WRECK (FROM ENC AND ADMIRALTY CHARTS)

DEPTH TO BASE OF UPPER CHALK Fm. (HORIZON H30)

- 150 DEPTH IN METRES BELOW LAT (CONTOURS AT 2 METRE INTERVAL)
- FAULT AT H30
- H30 NOT WELL DEFINED

DEPTH IN METRES BELOW LAT
THE DEPTH OF H30 RANGES BETWEEN 107 m AND 200 m bLAT

125.0
150.0
175.0
200.0

NOTES:

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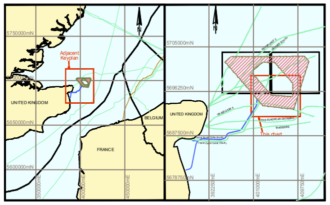

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GEOPHYSICAL SITE SURVEY
UK CONTINENTAL SHELF, NORTH SEA
THANET EXTENSION OFFSHORE WIND FARM
DEPTH TO BASE OF UPPER CHALK Fm. (HORIZON H30)
METRES BELOW LAT
SOUTH

SCALE 1 : 10000 at A0

0 100 200 400 600 800 1000 metres
0 1000 2000 3000 feet

Vessel: FUGRO PIONEER		Survey Date: JUL - SEPT 2016	Project Ref: GE051			
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