NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 15.1 Navigational Risk Assessment (Part 3 of 3)

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NORTH FALLS
Offshore Wind Farm

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Annex E Long term AIS Assessment (Six Months 2023) – Array Area

E.1 Introduction

992. Annex D presented an analysis of twelves months of AIS to capture a comprehensive picture of vessel traffic, covering the period March 2019 to February 2020, which was defined to pre-date the COVID 19 pandemic. Noting the time elapsed since, an additional six additional months of AIS from July 2023 to December 2023 has been analysed to ensure a comprehensive picture of the vessel traffic baseline can be established.

E.2 Methodology

E.2.1 Study Area

993. This annex has assessed the long-term vessel traffic data within the same study area for the array area introduced in Section 3.4.

E.2.2 Data Period and Temporary Vessel Traffic

994. The vessel traffic data assessed in this annex was collected from 1 July 2023 and 31 December 2023 inclusive.

995. As per the vessel traffic surveys, a number of vessel tracks recorded during the data period were classified as temporary (non-routine) and have been excluded from the characterisation of the vessel traffic baseline, including tracks of guard and survey vessels. These tracks are presented in Figure E.1.

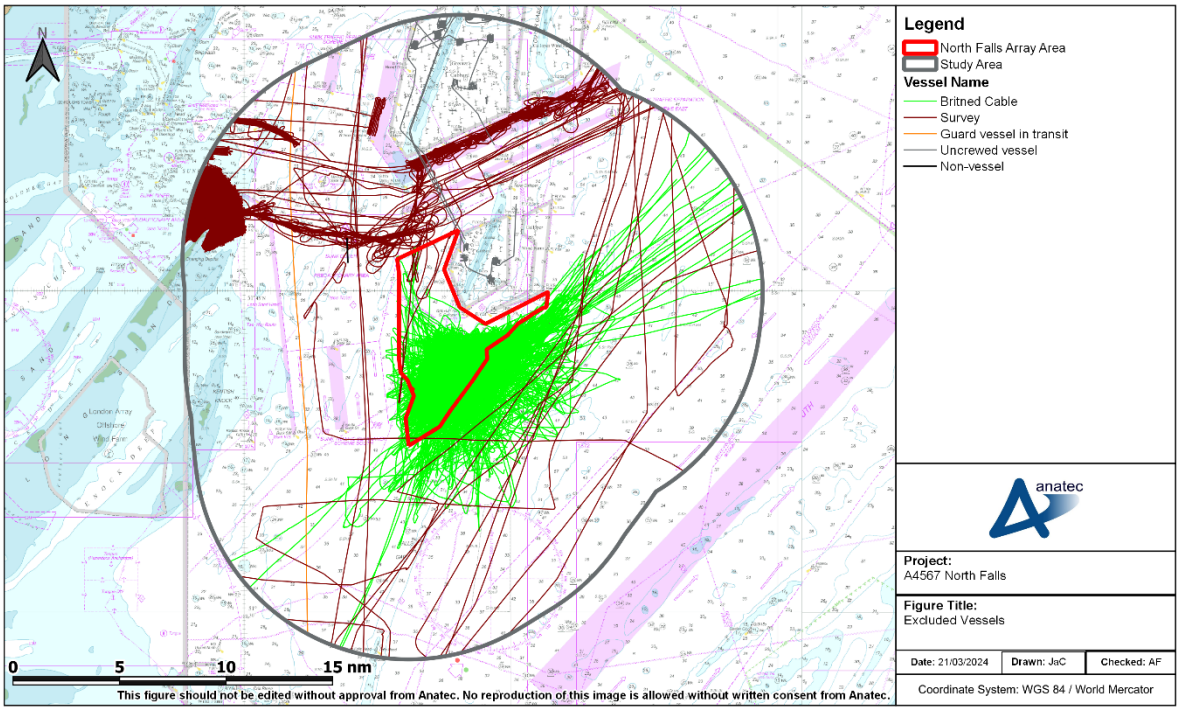

Figure E.1 Excluded Vessels

996. Excluded traffic mainly consisted of vessels involved in activities associated with the BritNed cable located within the array area, or vessels that were actively engaged in, or transiting to/from, surveys.

997. In addition, uncrewed vessels at Greater Gabbard were removed as these are considered irregular activity, with the activity also only occurring within the Greater Gabbard site.

E.2.3 AIS Carriage

998. General limitations associated with the use of AIS data (for example, carriage requirements) are discussed in full within section 5.4.1.

E.3 Long-Term Vessel Traffic Movements

E.3.1 Overview

999. An overview of vessel traffic recorded during the six-month period within the study area (excluding temporary traffic) is shown in Figure E.2, colour-coded by vessel type. Following this, Figure E.3 presents the density of these vessels within a 0.5nm x 0.5nm grid.

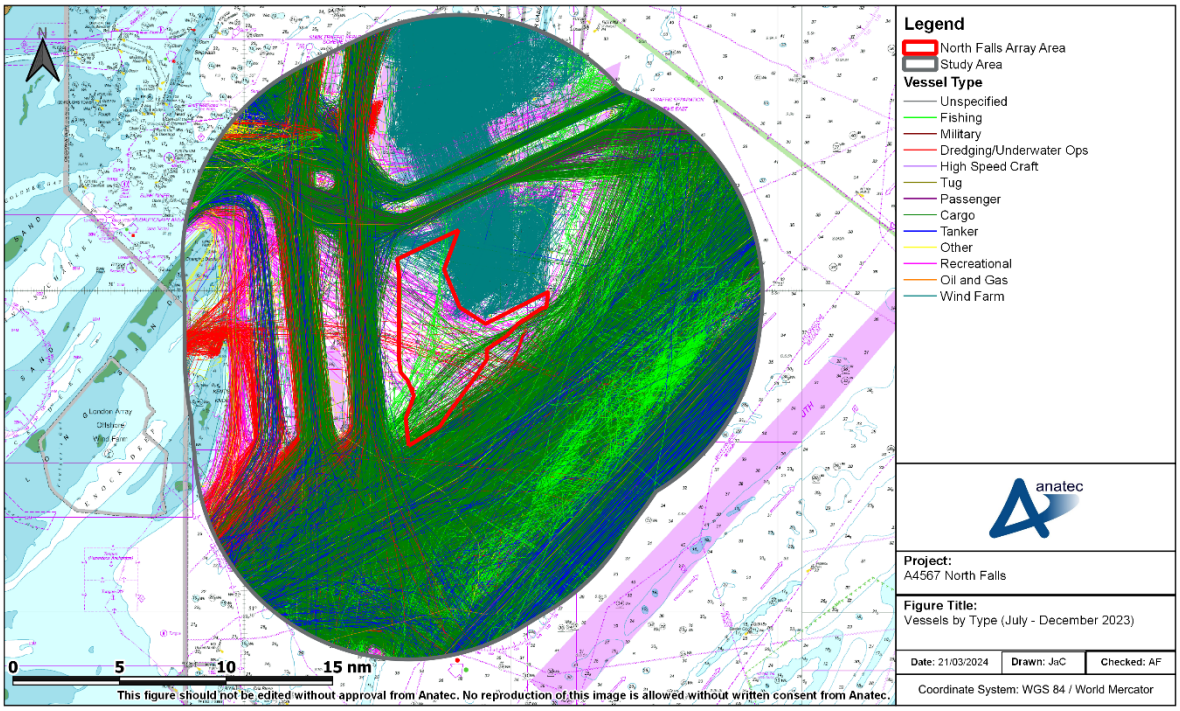

Figure E.2 Vessels by Type (July – December 2023)

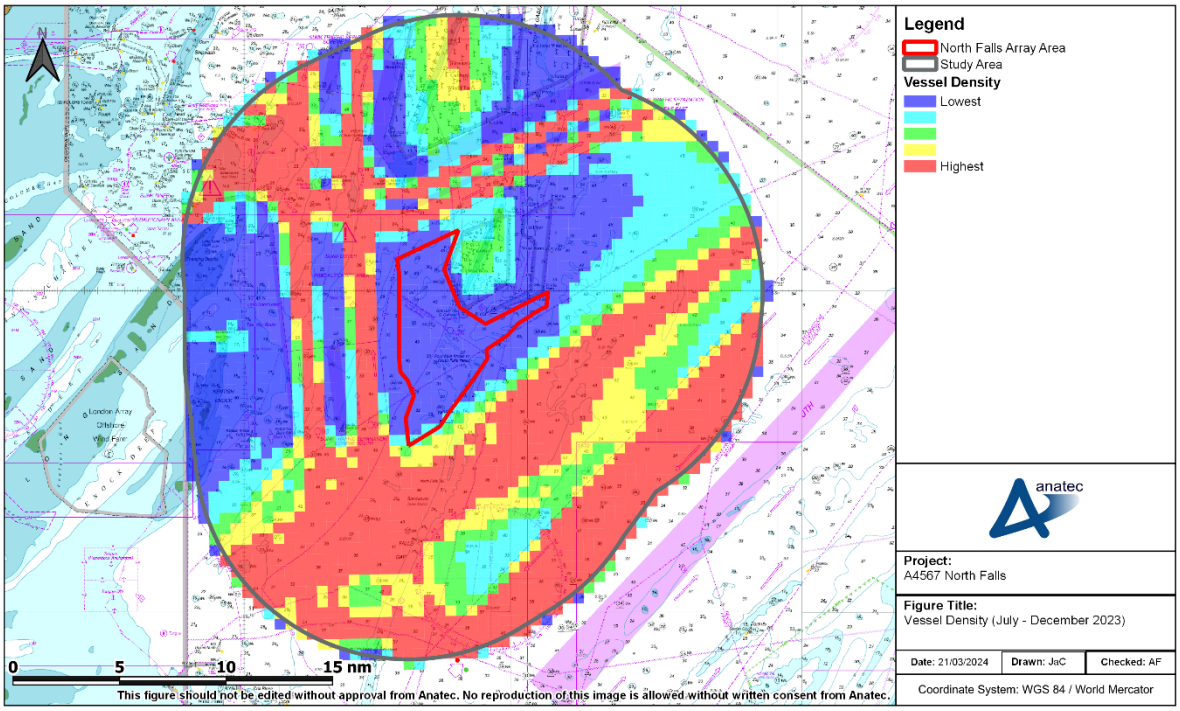

Figure E.3 Vessel Density (July – December 2023)

1000. The regions of highest traffic density generally align with the lanes of the nearby TSSs (the Sunk TSSs and TSS North Hinder South), with a high density region also illustrating a northeast/southwest route parallel to TSS North Hinder South (the

outer extremity of which only intersects the southernmost tip of the array area). High density can also seen within the precautionary areas and the northern array of Greater Gabbard. There is relatively low density within the array area itself, which indicates that the Galloper Recommended Route (shown in Figure 7-2) is not heavily used. Further analysis of the Galloper Recommended Route is provided in Section E.3.4.9.

E.3.2 Vessel Count

1001. Figure E.4 presents daily average vessel counts broken down by month and vessel type.

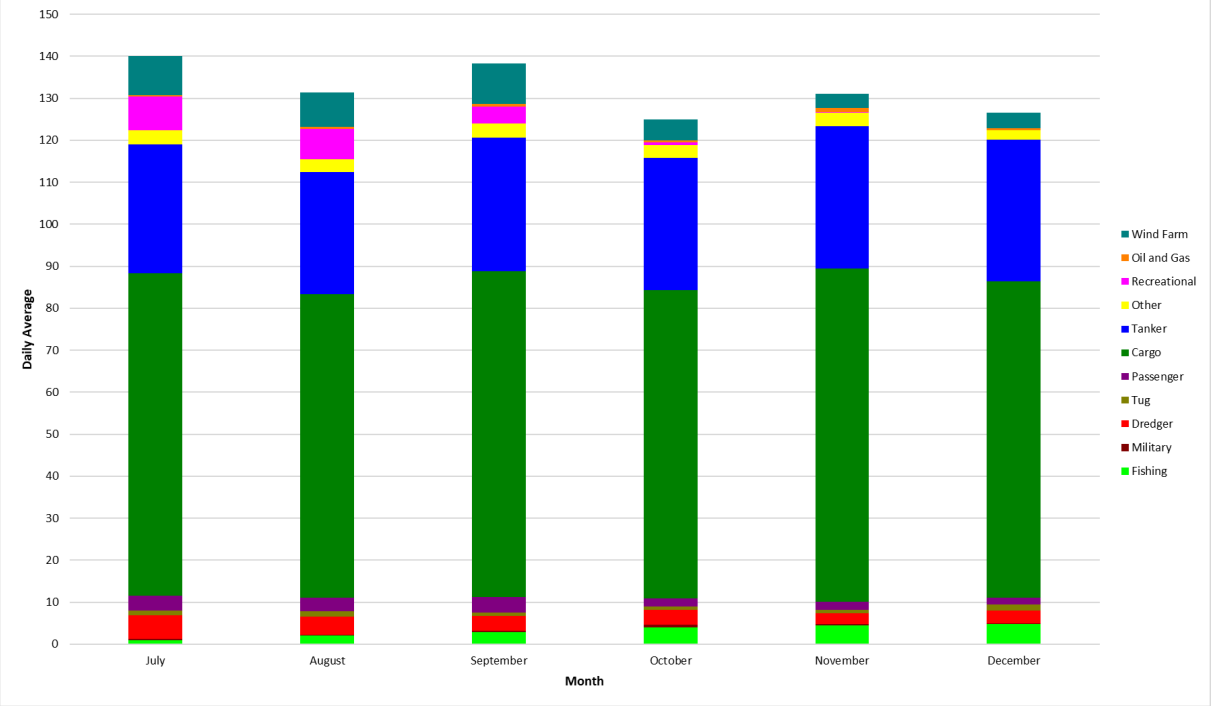

Figure E.4 Daily Average Counts per Month per Vessel Type (July – December 2023)

1002. It can be seen that vessel levels remained reasonably consistent per vessel type throughout the six-month period; the vessel type which had the greatest variation was recreational, with 95% of recreational vessels recorded during the months of July, August and September.

1003. An average of 132 vessels per day was recorded within the study area during the six-month period. The busiest month was July, with an average of 140 vessels per day. The busiest day overall was 14 July 2023, with a total of 178 unique vessels recorded.

1004. The busiest month (July) and the busiest day overall (14 July 2023) are presented in Figure E.5 and Figure E.6 respectively.

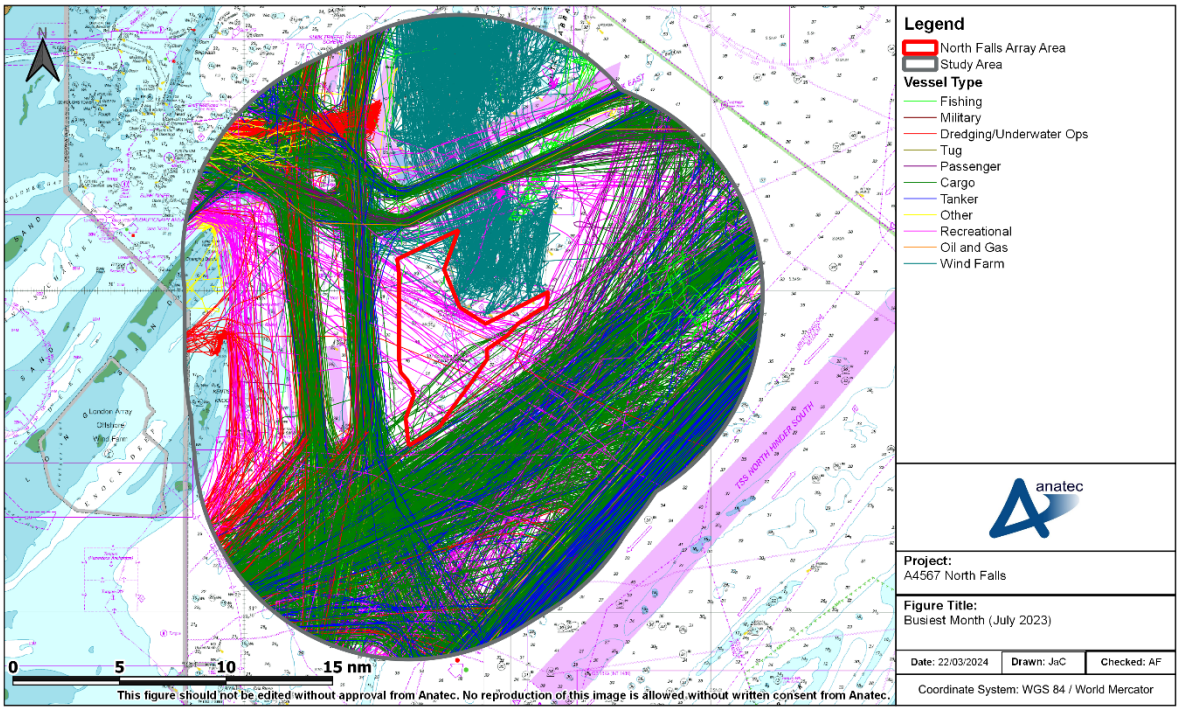

Figure E.5 Busiest Month (July 2023)

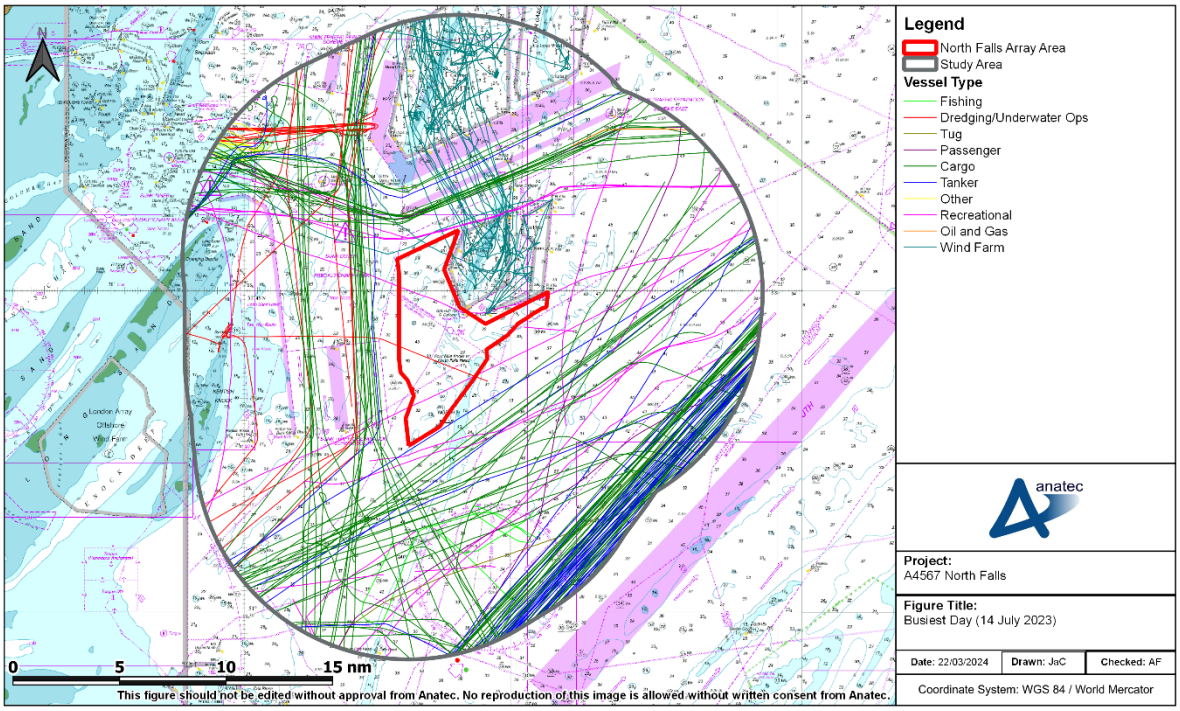

Figure E.6 Busiest Day (14 July 2023)

E.3.3 Vessel Length

1005. The vessel traffic recorded during the six-month period within the study area is shown in Figure E.7, colour-coded by vessel length. Over 99% of vessels were associated with a known length.

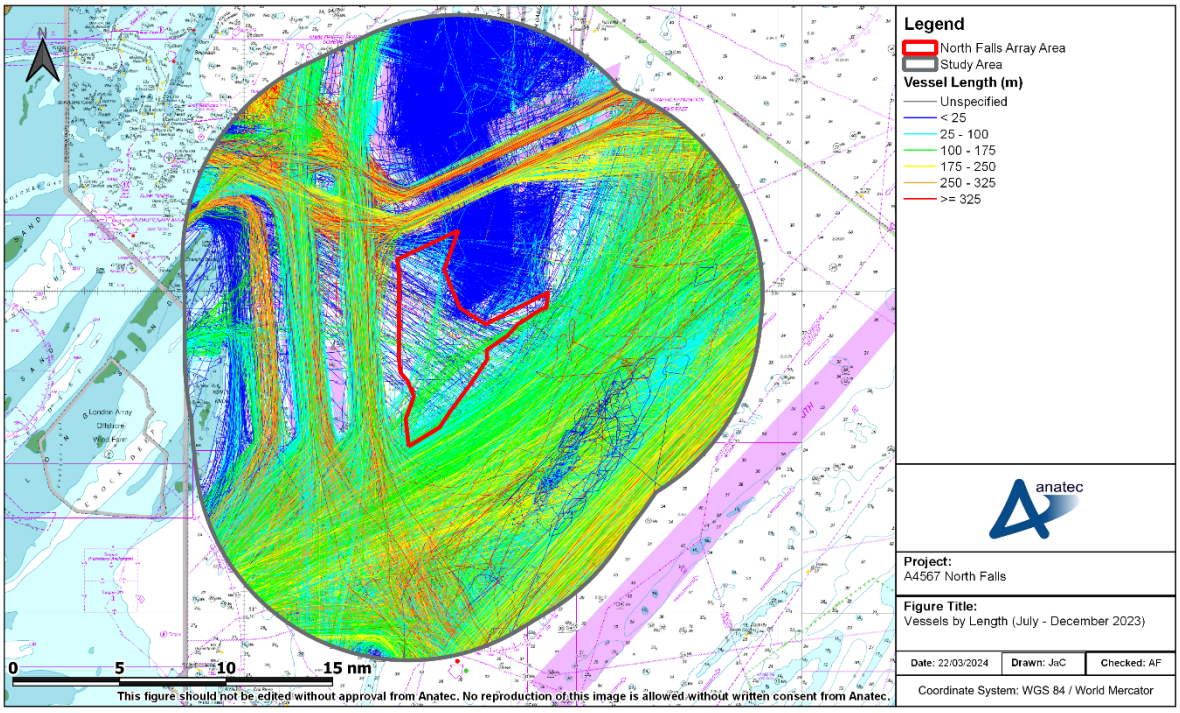

Figure E.7 Vessels by Length (July – December 2023)

1006. The shortest vessels (less than 25m) generally comprised wind farm support vessels associated with the Greater Gabbard and Galloper offshore wind farms as well as fishing vessels, pilot vessels and recreational vessels. The longest vessels (at least 325m) were comprised of commercial vessels (i.e. passenger vessels, cargo vessels and tankers) mainly seen utilising the Sunk TSSs and TSS North Hinder South.

1007. The distribution of vessel lengths (excluding unspecified values, which accounted for less than 1%) is presented in Figure E.8.

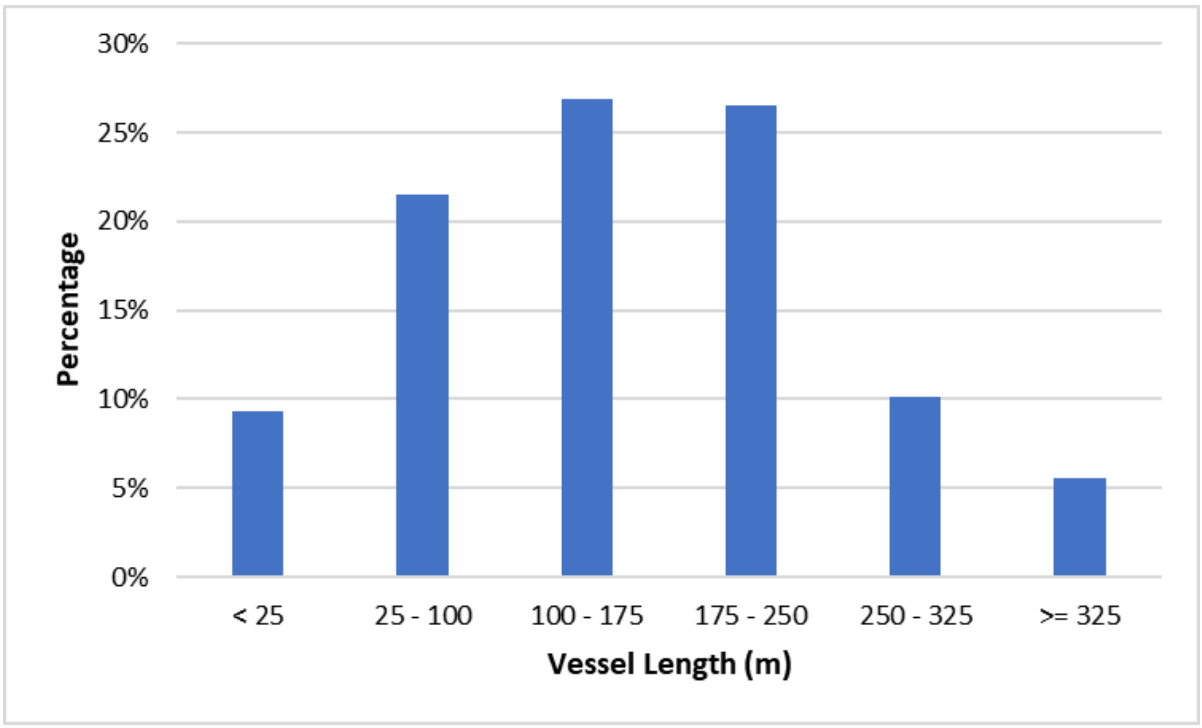

Figure E.8 Distribution of Vessel Lengths (July – December 2023)

1008. The average vessel length was 157m. The longest vessels recorded were 400m container ships.

E.3.4 Vessel Type

1009. The distribution of vessel types is presented in Figure E.9. All vessels were assigned a known type.

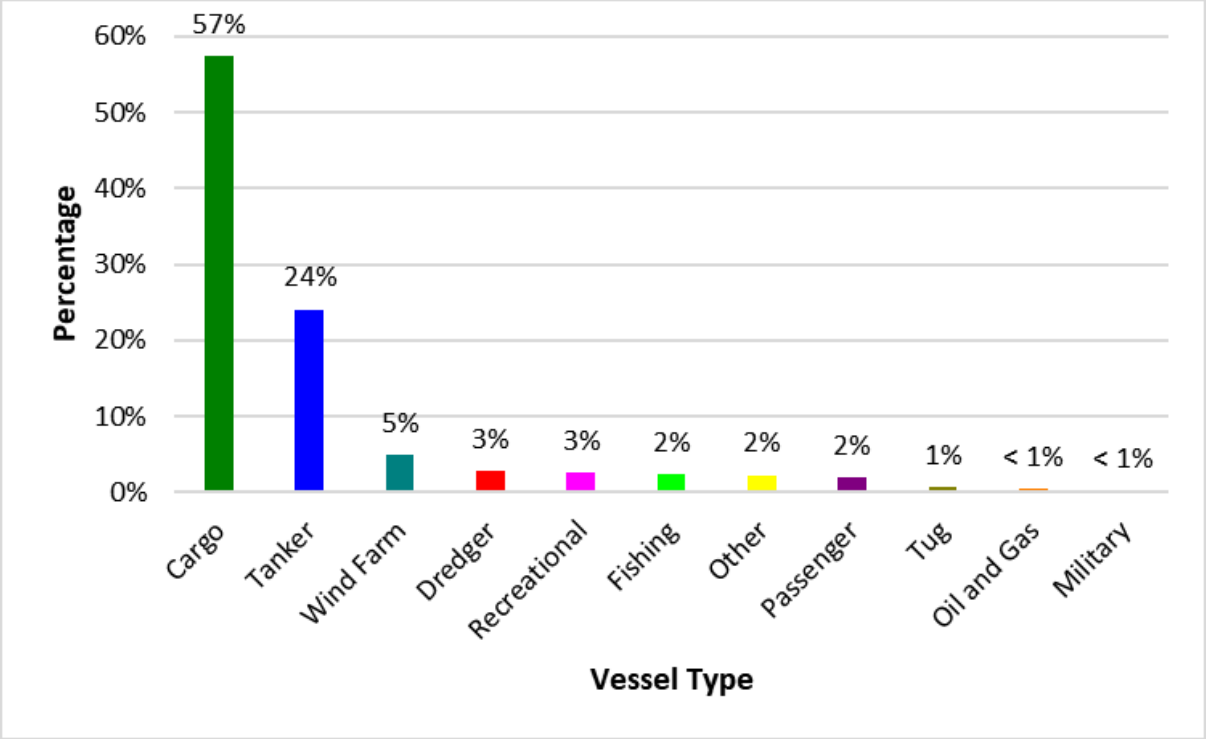

Figure E.9 Distribution of Vessel Types (July – December 2023)

1010. The majority (57%) of vessels recorded within the study area during the six-month period were cargo. Tankers were also common, accounting for 24%. Each main vessel type is analysed in detail in the following subsections.

E.3.4.2 Cargo Vessels

1011. Figure E.10 presents the cargo vessels recorded within the study area during the six-month period, colour-coded by length.

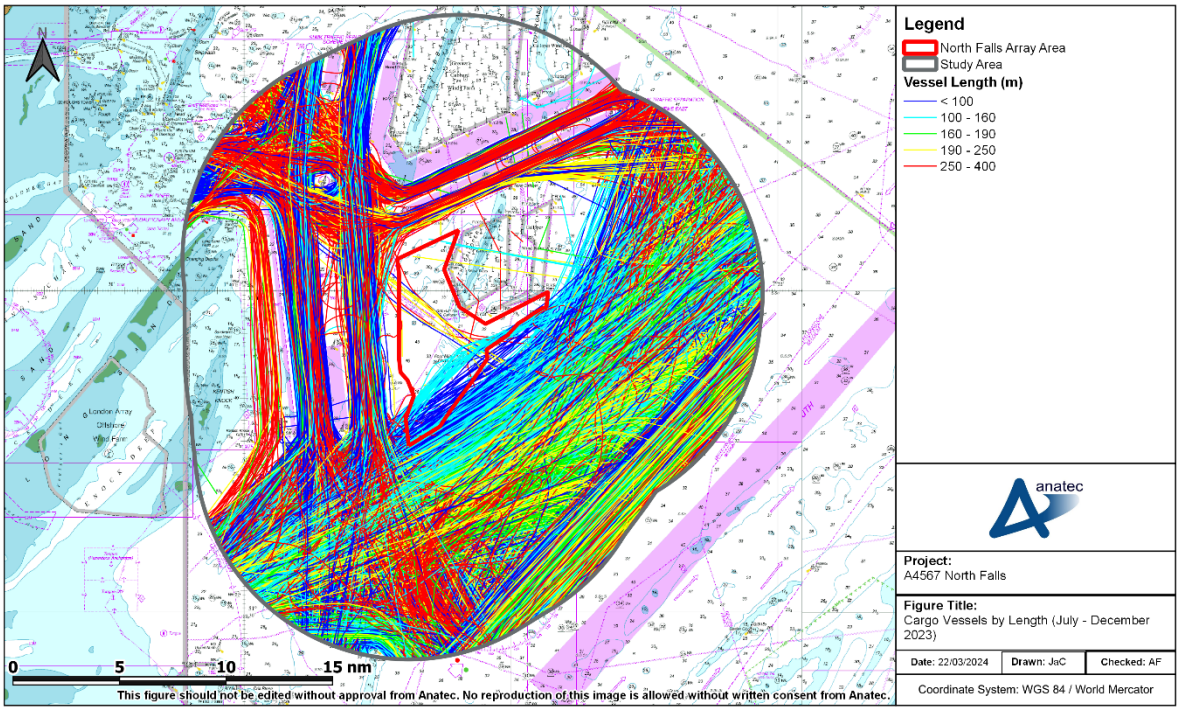

Figure E.10 Cargo Vessels by Length (July – December 2023)

1012. Cargo vessels of all lengths were generally seen utilising the nearby TSSs (the Sunk TSSs and TSS North Hinder South) as well as transiting northeast/southwest between TSS North Hinder South and the array area. It is also noted that a limited number of cargo vessels were observed to use the Galloper Recommended Route (shown in Figure 7-2); further details on these vessels can be found in section E.3.4.9.

1013. The daily average number of cargo vessels per month is presented in Figure E.11.

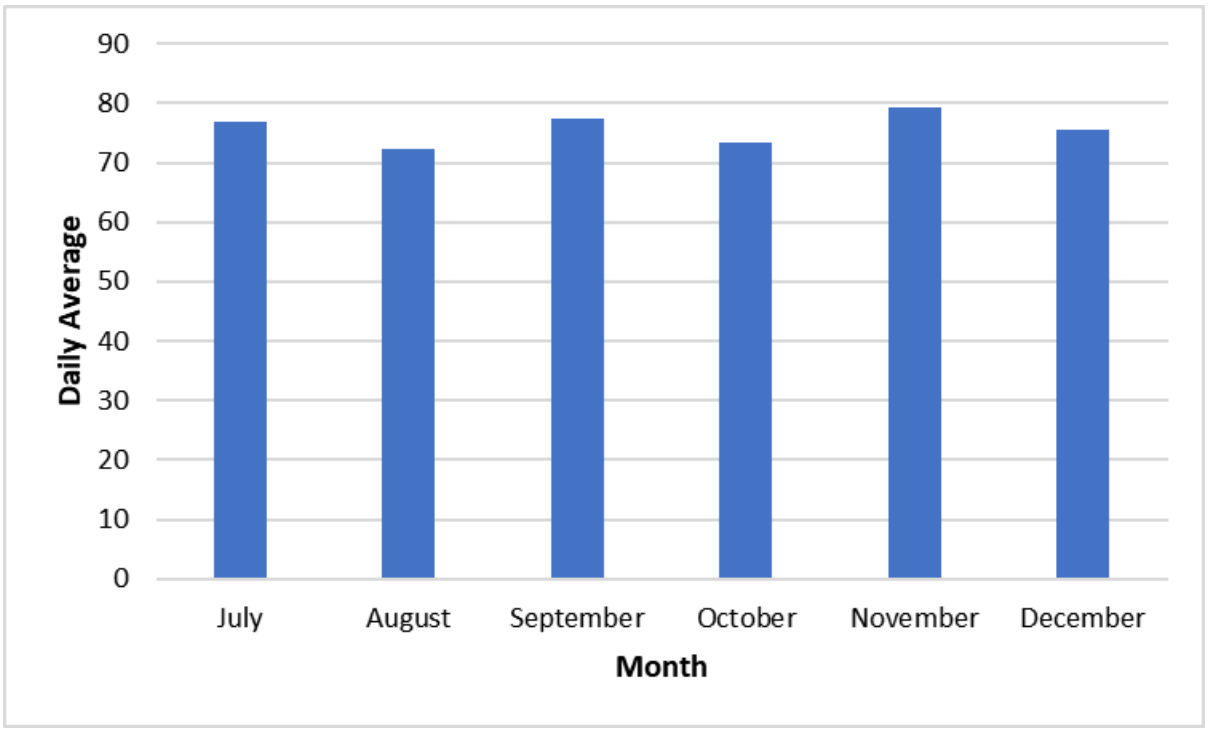

Figure E.11 Daily Average Number of Cargo Vessels per Month (July – December 2023)

1014. Overall, there was an average of 76 unique cargo vessels per day recorded during the six-month period. There was minimal variation around this average from month to month. An average of one to two unique cargo vessels per day was recorded within the array area during the six-month period; the majority of these intersections through the array area were through the southern portion of the array area as opposed to resulting from usage of the Galloper Recommended Route (see section E.3.4.9 for further details on intersecting traffic).

E.3.4.3 Tankers

1015. Figure E.12 presents the tankers recorded within the study area during the six-month period, colour-coded by length.

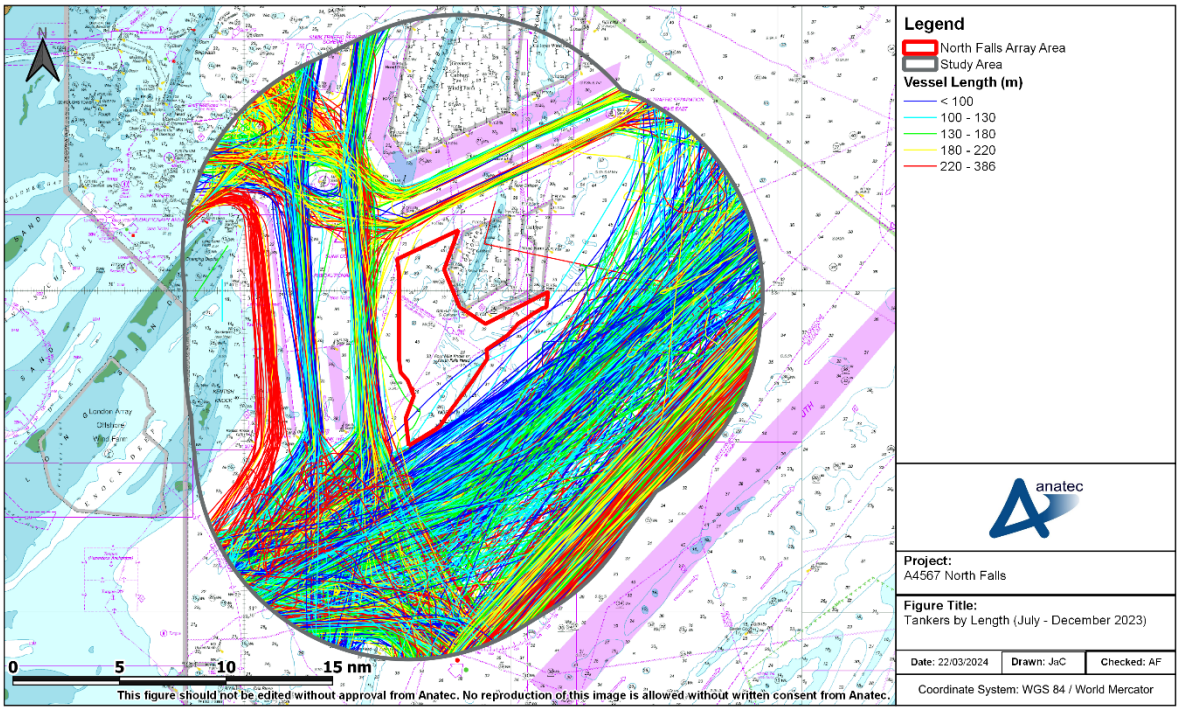

Figure E.12 Tankers by Length (July – December 2023)

1016. Traffic patterns were similar to that of cargo vessels; see Section E.3.4.2.

1017. The daily average number of tankers per month is presented in Figure E.13.

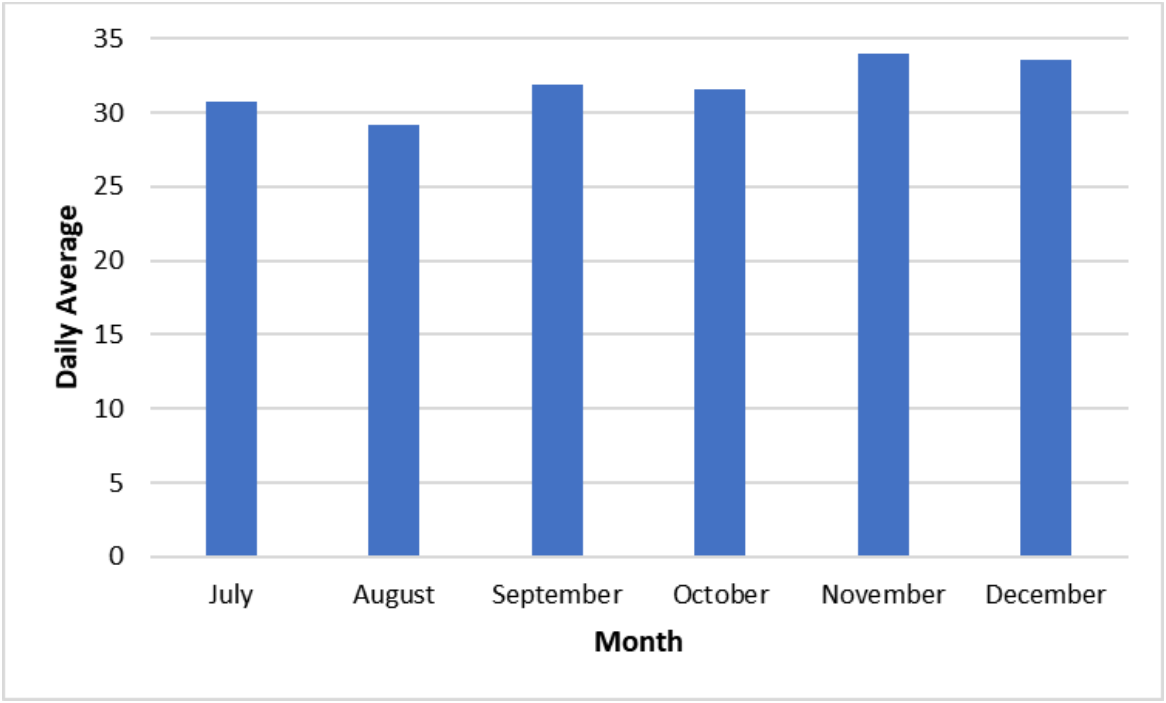

Figure E.13 Daily Average Number of Tankers per Month (July – December 2023)

1018. Overall, there was an average of 32 unique tankers per day recorded during the six-month period. Similar to cargo vessels (see Section E.3.4.2), there was minimal variation around the average from month to month. A total of seven intersections through the array area by tankers was recorded during the six-month period, corresponding to an average of one per month.

E.3.4.4 Wind Farm Vessels

1019. Figure E.14 presents the wind farm support vessels recorded within the study area during the six-month period. Also shown are the boundaries of the Greater Gabbard and Galloper offshore wind farms.

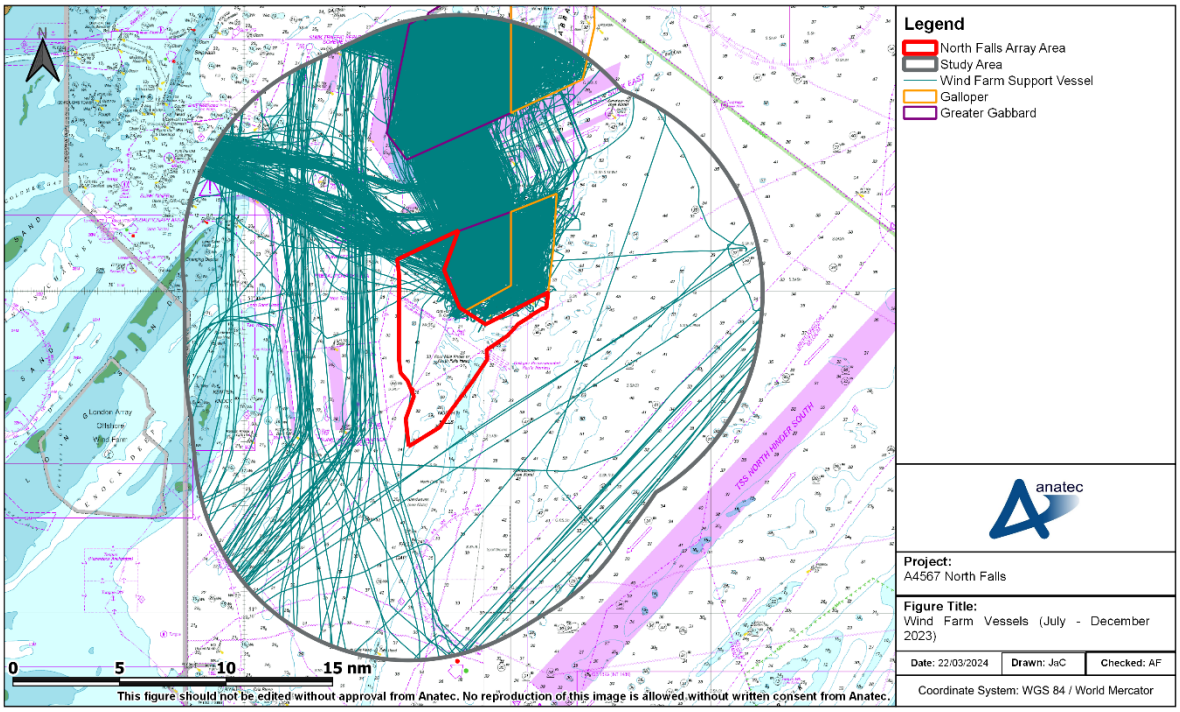

Figure E.14 Wind Farm Vessels (July – December 2023)

1020. The majority of wind farm support vessel traffic was associated with the operational Greater Gabbard and Galloper offshore wind farms. These vessels were commonly transiting to/from Harwich, Lowestoft and Great Yarmouth.

1021. The daily average number of wind farm support vessel transits per month is presented in Figure E.15.

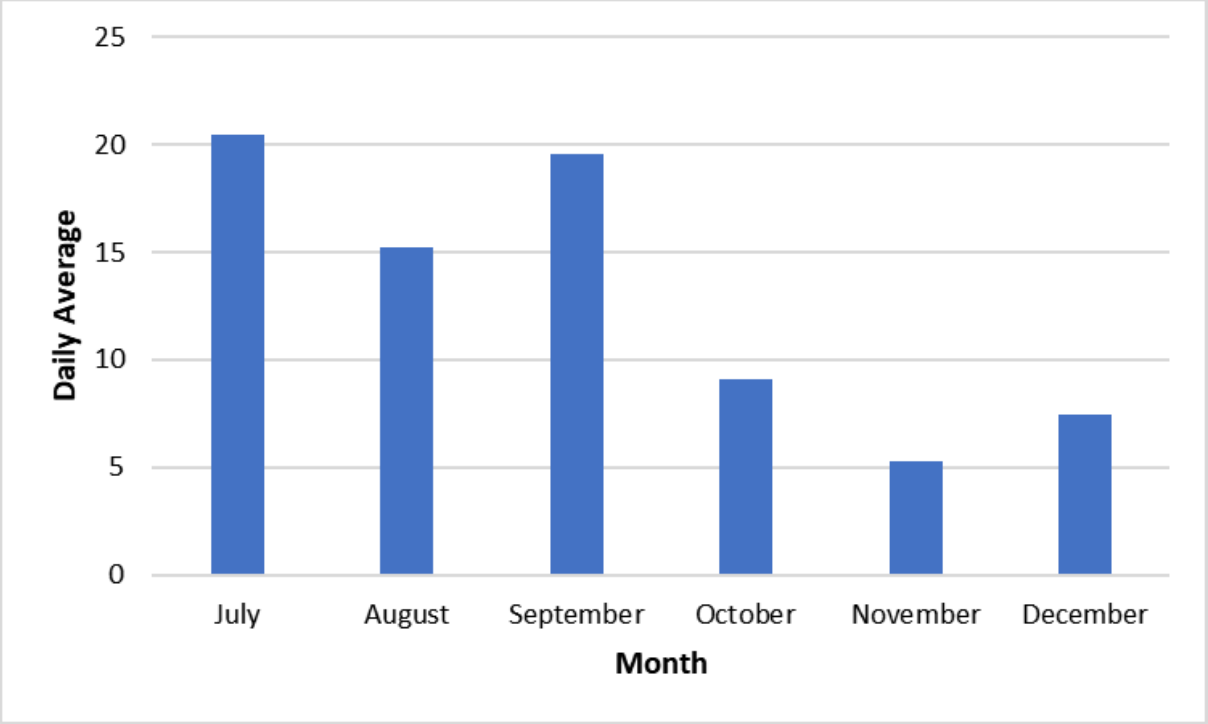

Figure E.15 Daily Average Number of Wind Farm Support Vessels per Month (July – December 2023)

1022. Overall, there was an average of 13 wind farm support vessel transits per day recorded during the six-month period. One to two per day were seen within the array area.

1023. There was notable seasonal variation in traffic levels, with daily averages being higher during July, August and September compared to October, November and December. The busiest month was July, with a daily average of 20 to 21 transits, while the quietest month was November, with a daily average of five to six transits.

E.3.4.5 Marine Aggregate Dredgers

1024. Figure E.16 presents the marine aggregate support dredgers recorded within the study area during the six-month period. Also shown are the dredging areas, colour-coded by type, and the spoil grounds.

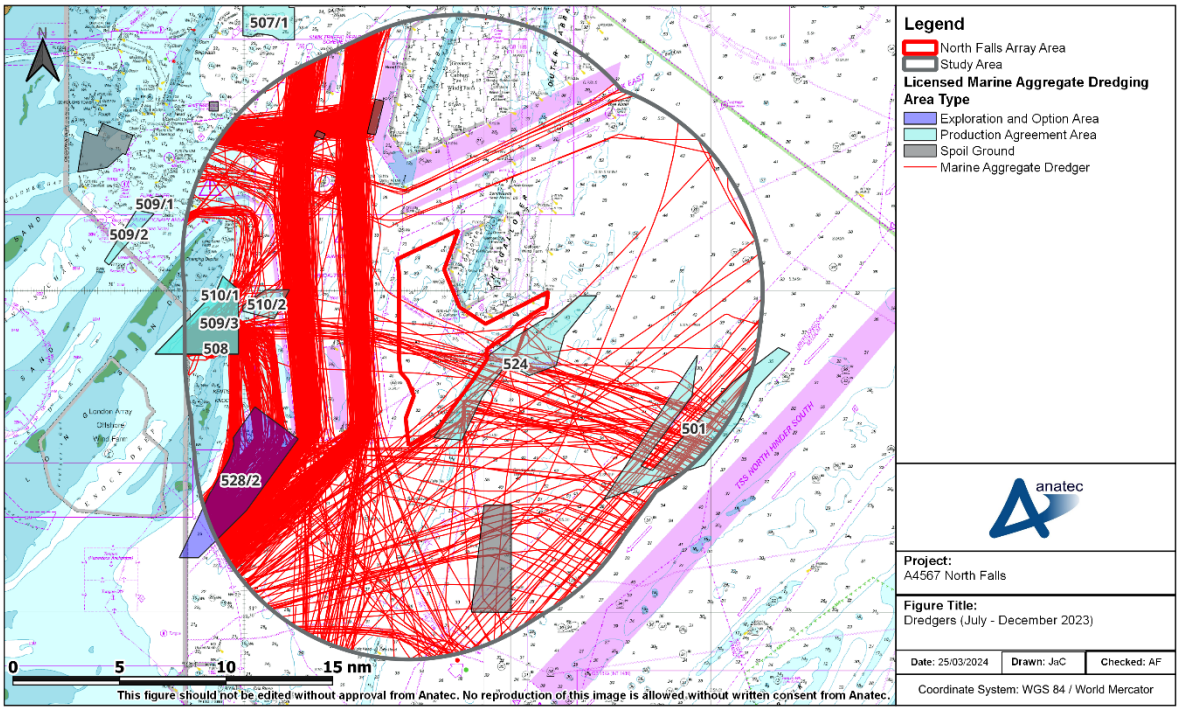

Figure E.16 Dredgers (July – December 2023)

1025. Dredgers were mainly observed within the western half of the study area, transiting within both lanes of Sunk TSS North and Sunk TSS South. Dredgers were also seen dumping into the spoil grounds to the northwest of the array area.

1026. Dredging activity was observed within the dredging area located adjacent to the array area at its southeast (identified in Figure E.16 as area *524*). This is shown in more detail in Figure E.17.

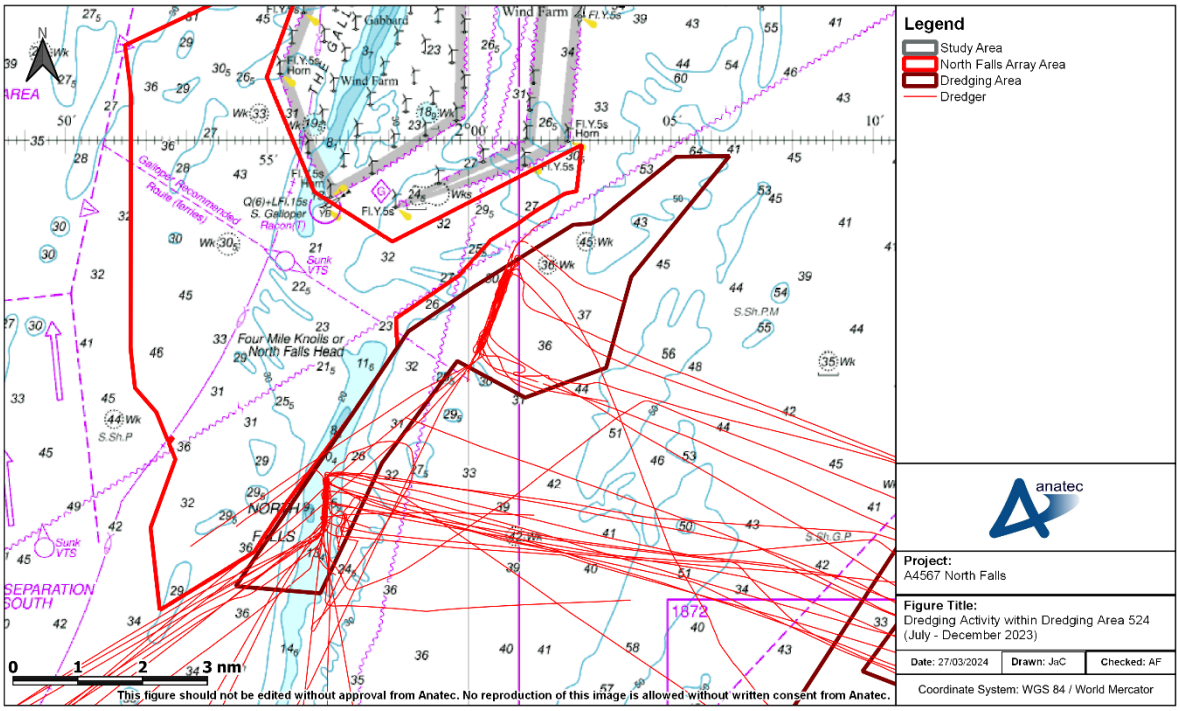

Figure E.17 Dredging Activity within Dredging Area 524 (July – December 2023)

1027. It can be seen that aggregate dredging occurred in two locations within area *524* over the six-month period. The associated vessels generally avoided the array area while transiting to/from area 524 as well as while actively dredging; a total of three intersections through the array area occurred, as a result of northeast transits to the dredging locations.

1028. Marine aggregate dredging activity was also observed within the coincident dredging areas at the western extent of the study area (identified in Figure E.16 as areas *510/1*, *509/3* and *508*).

1029. The daily average number of dredgers per month is presented in Figure E.18.

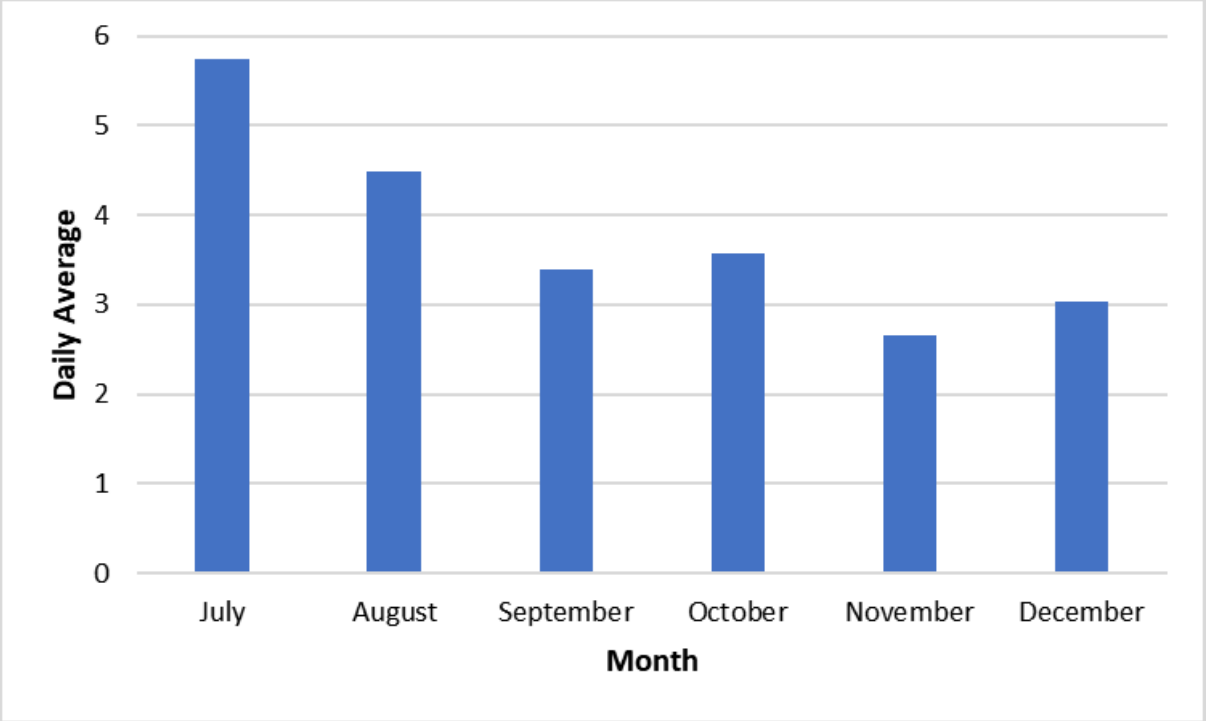

Figure E.18 Daily Average Number of Dredgers per Month (July – December 2023)

1030. Overall, there was an average of four unique marine aggregate dredgers per day recorded during the six-month period. A total of 26 intersections through the array area was recorded, corresponding to an average of one a week.

1031. There was some minor variation in traffic levels, with daily averages being higher during July and August compared to September, October, November and December. The busiest month was July, with a daily average of five to six dredgers, while the quietest month was November, with a daily average of two to three dredgers.

E.3.4.6 Recreational Vessels

1032. Figure E.19 presents the recreational vessels recorded within the study area during the six-month period. It is noted that sailing vessels and yachts larger than 24m in length have been classified as passenger (see section E.3.4.8).

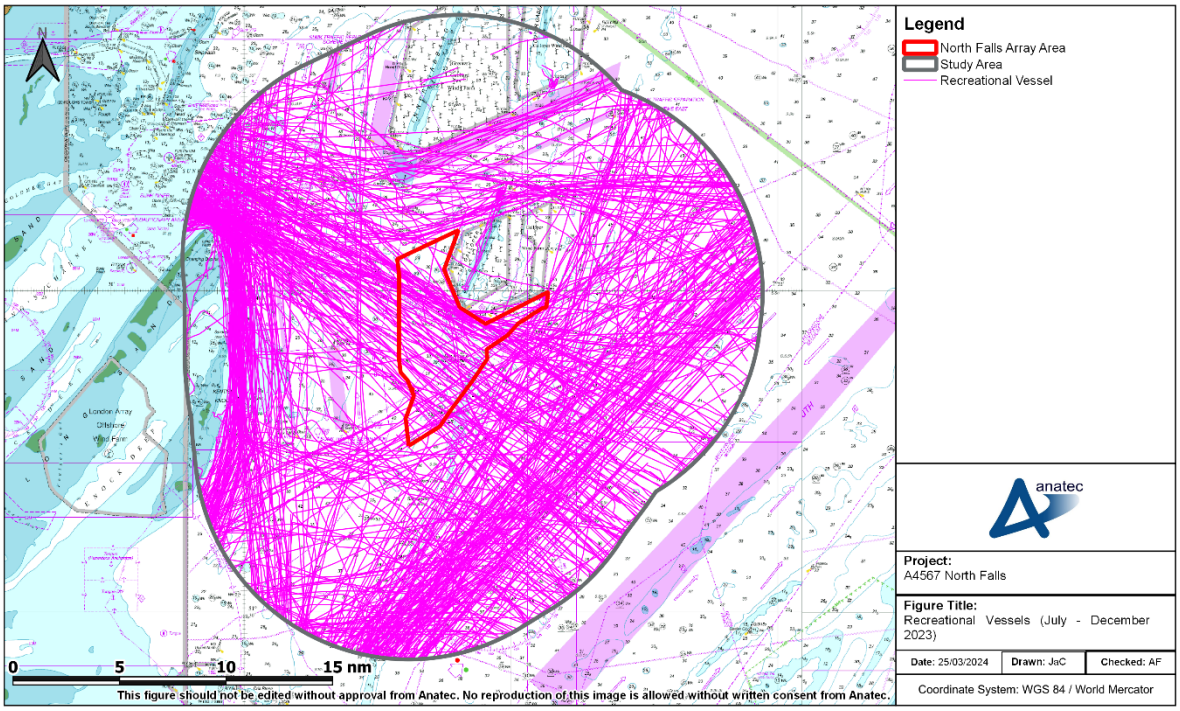

Figure E.19 Recreational Vessels (July – December 2023)

1033. Recreational vessels were seen throughout the study area transiting in a variety of directions. The daily average number of recreational vessels per month is presented in Figure E.20.

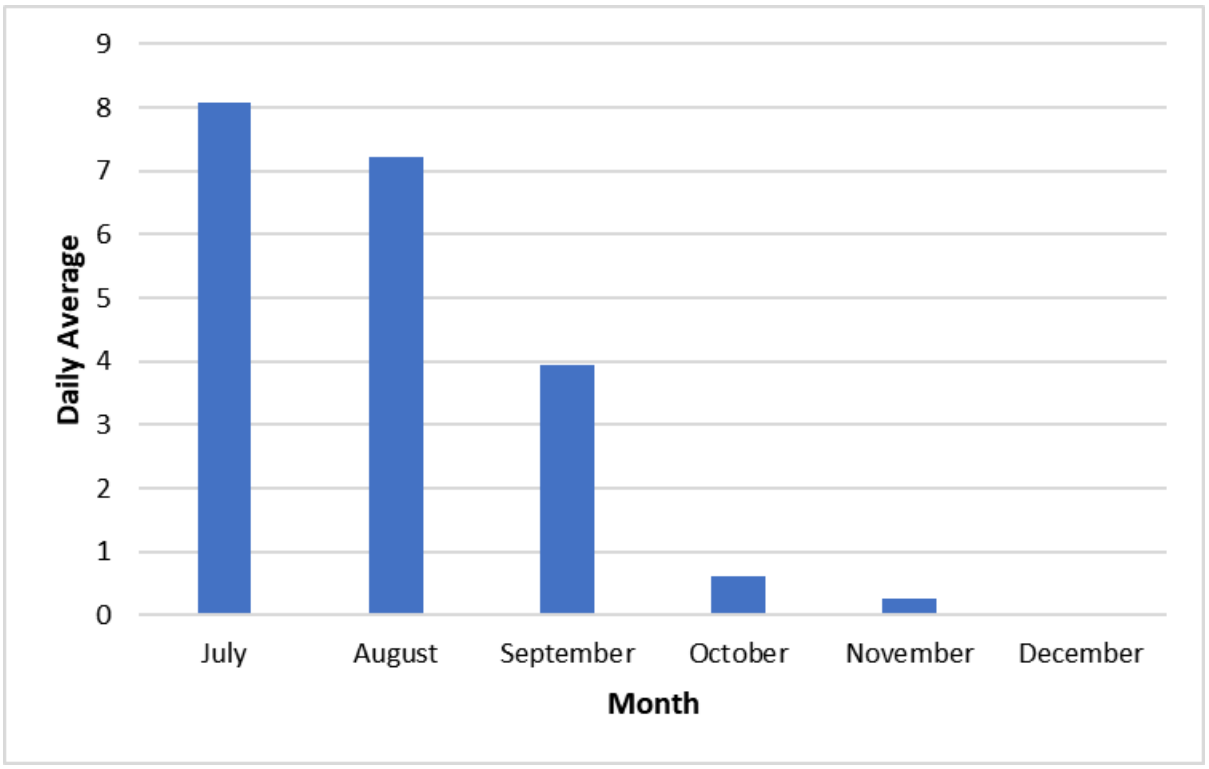

Figure E.20 Daily Average Number of Recreational Vessels per Month (July – December 2023)

1034. There was significant seasonal variation in traffic levels, with daily averages being significantly higher during July, August and September compared to October, November and December; this can be attributed to summer conditions generally being more favourable for recreation. The busiest month was July, with an average of eight recreational vessels per day, while the quietest month was December, with only a single recreational vessel recorded throughout its duration.

1035. July, August and September accounted for 95% of recreational traffic over the six-month period, with an average of six to seven recreational vessels per day being recorded over these three months. An average of one to two recreational vessels per day was recorded within the array area during these three months.

1036. The remaining 5% of traffic recorded over October, November and December corresponds to an average frequency of one every three to four days. A total of three intersections through the array area was recorded during these three months.

E.3.4.7 Fishing Vessels

1037. Figure E.21 presents the fishing vessels recorded within the study area during the six-month period, colour-coded by average speed. As a general heuristic, average speeds of less than six knots are considered to be indicative of active fishing. In addition to speed, active fishing can also be indicated by track behaviour as well as navigational status and/or destination broadcast on AIS.

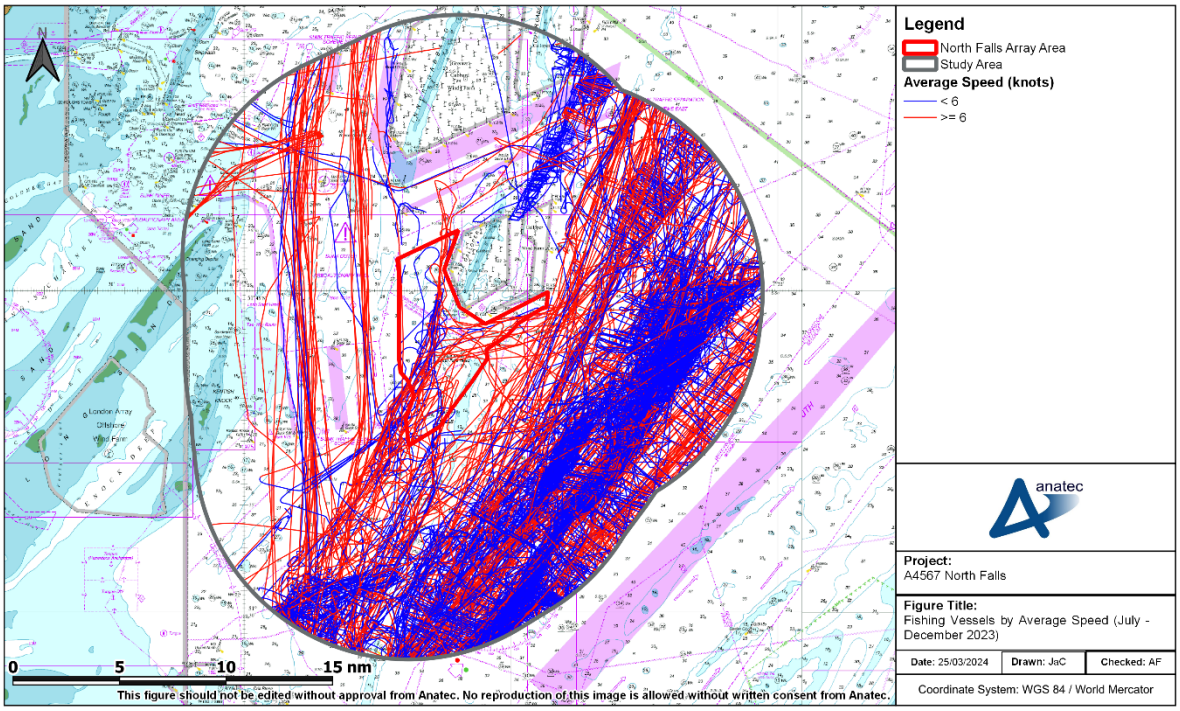

Figure E.21 Fishing Vessels by Average Speed (July – December 2023)

1038. Fishing vessels were mainly observed within the southeastern portion of the study area, where a significant amount of potential active fishing behaviour was also observed. Potential active fishing behaviour was also observed to the northeast of the array area as well as within the array area itself.

1039. The daily average number of fishing vessels per month is presented in Figure E.22.

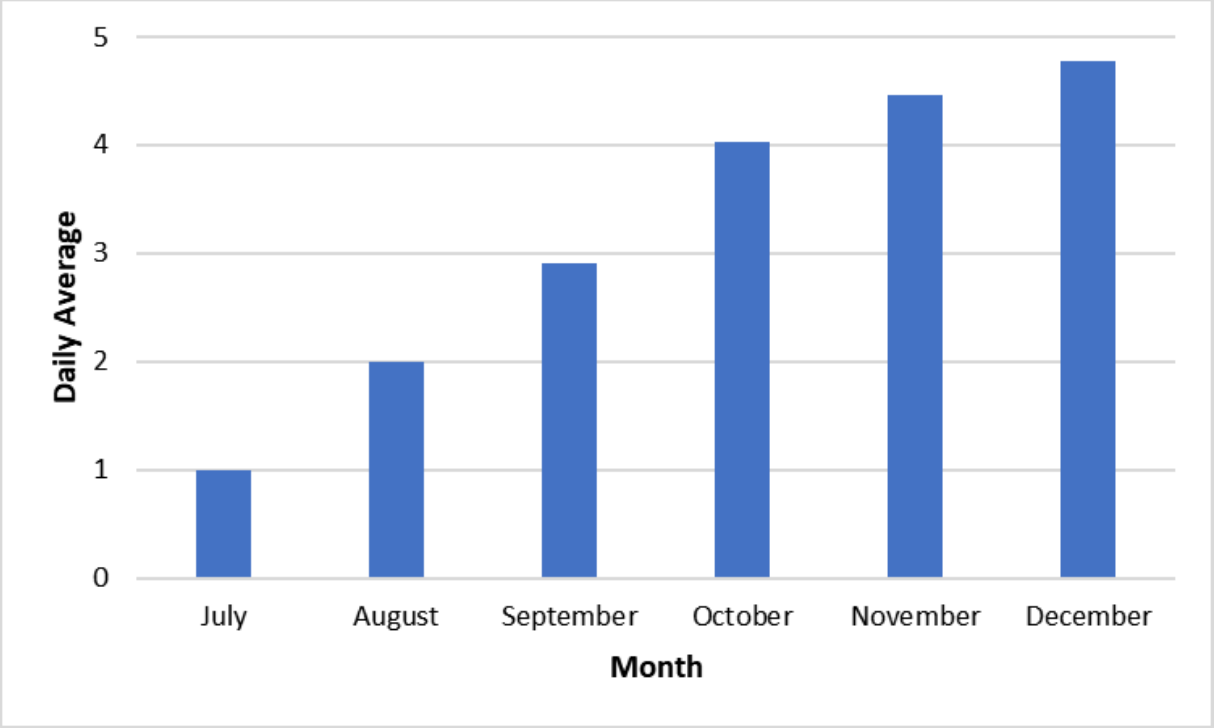

Figure E.22 Daily Average Number of Fishing Vessels per Month

1040. Overall, there was an average of three fishing vessels per day recorded during the six-month period. A total of 23 intersections through the array area by fishing vessels was recorded, corresponding to an average of one every eight days.

1041. There was notable seasonal variation in daily averages for fishing vessels, with the daily average increasing from each month between July and December. The quietest month, July, had an average of one fishing vessel per day recorded while the busiest month, December, had an average of five fishing vessels per day recorded.

E.3.4.8 Passenger Vessels

1042. Figure E.23 presents the passenger vessels recorded within the study area during the six-month period. It is noted that sailing vessels and yachts have been classed as passenger if they exceed 24m in length and are otherwise classified as recreational (see section E.3.4.6).

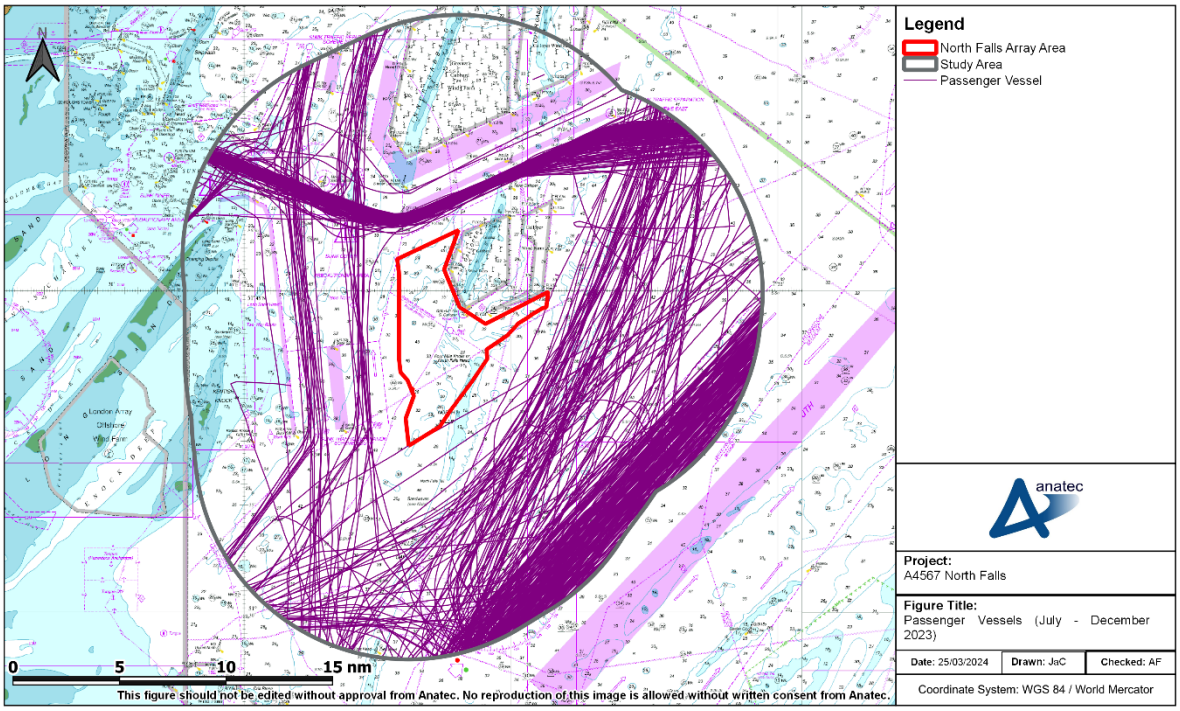

Figure E.23 Passenger Vessels (July – December 2023)

1043. Passenger vessels were more commonly seen within TSS North Hinder South and the eastbound lane of Sunk TSS East, with a smaller proportion also seen using both lanes of Sunk TSS North and both lanes of Sunk TSS South. The eastbound lane of Sunk TSS East was mainly undertaken by two Roll-on/Roll-off Passenger (RoPax) vessels operated by StenaLines transiting from Harwich (United Kingdom (UK)) to Hoek Van Holland (the Netherlands); the inbound transits avoid the study area, preferring to pass further north.

1044. Two large sailing vessels passed through the extremity of the array area boundary; one at its southern extent and one at its eastern extent. Besides these two vessels, there were no intersections through the array area from passenger vessels during the six-month period; in particular, no vessels were seen using the Galloper Recommended Route shown in Figure 7-2.

1045. The daily average number of passenger vessel transits per month is presented in Figure E.24.

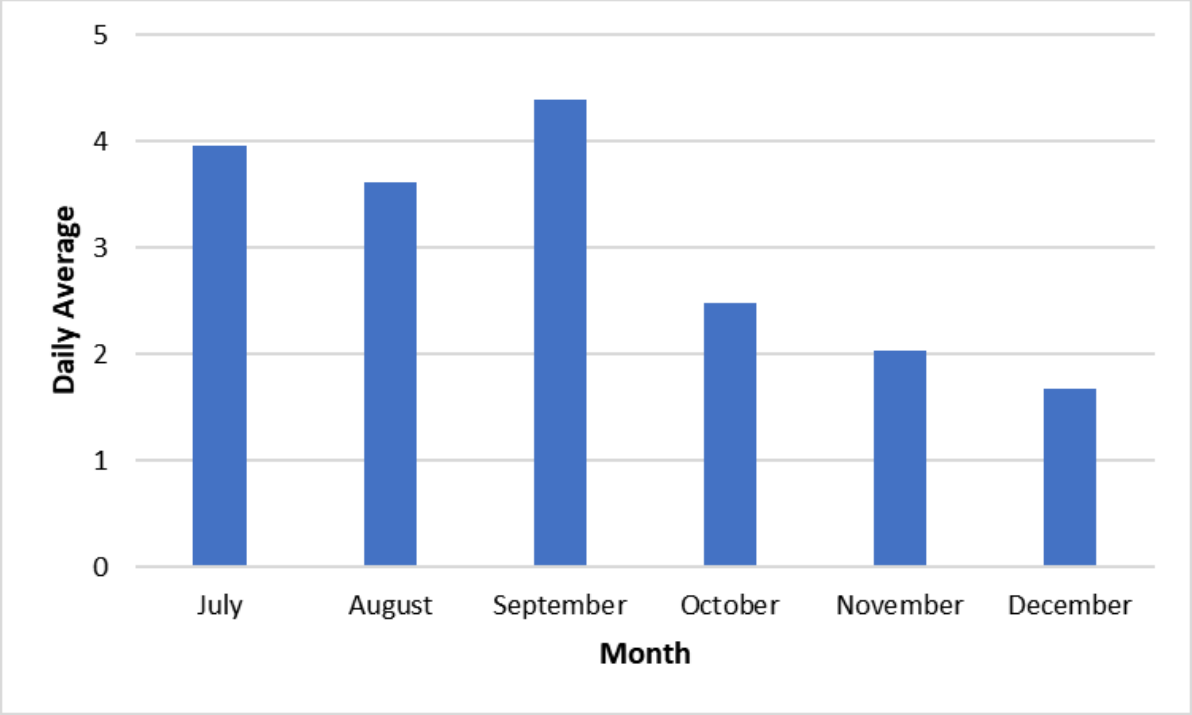

Figure E.24 Daily Average Number of Passenger Vessel Transits per Month

1046. Overall, there was an average of three passenger vessel transits per day recorded during the six-month period. As mentioned above, there were only two intersections through the array area, which were at the array area's extremities.

1047. There was minor seasonal variation in daily averages for passenger vessels, with the daily average being higher during the months of July, August and September compared to October, November and December. The quietest month was December, with an average of one to two transits per day. The busiest month was September, with an average of four to five transits per day.

E.3.4.9 Summary of Intersecting Traffic

1048. Figure E.25 presents the vessels recorded intersecting the array area during the six-month period, colour-coded by vessel type.

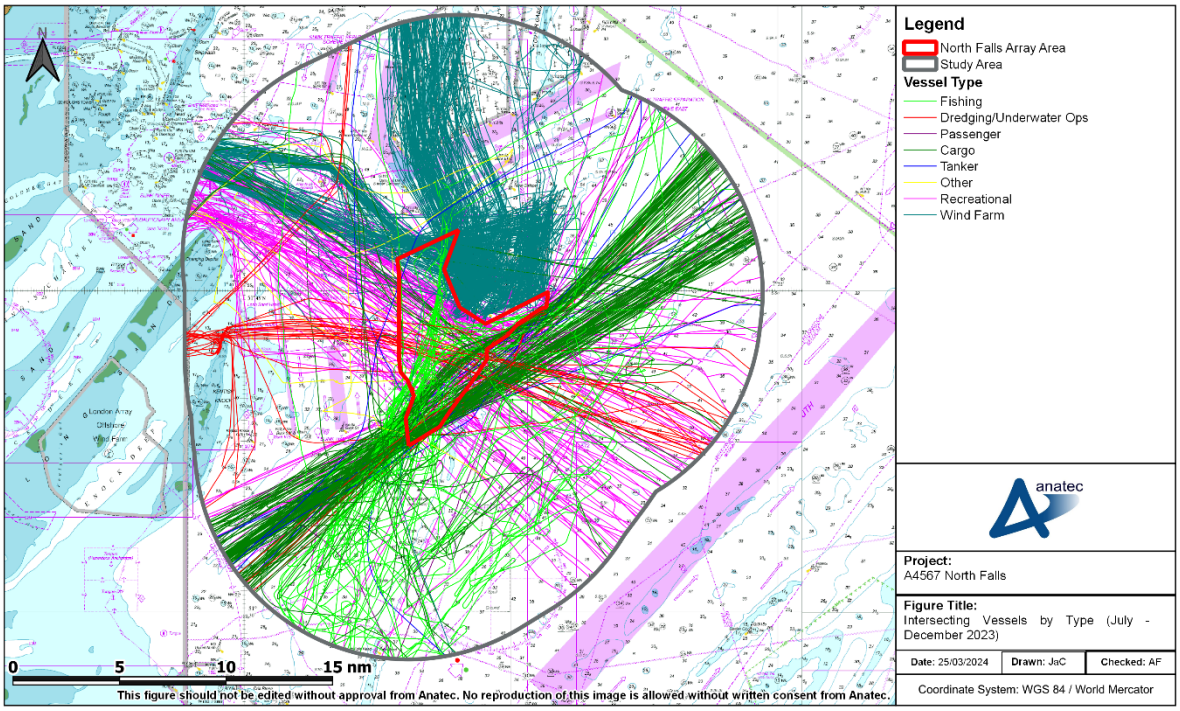

Figure E.25 Intersecting Vessels by Type (July – December 2023)

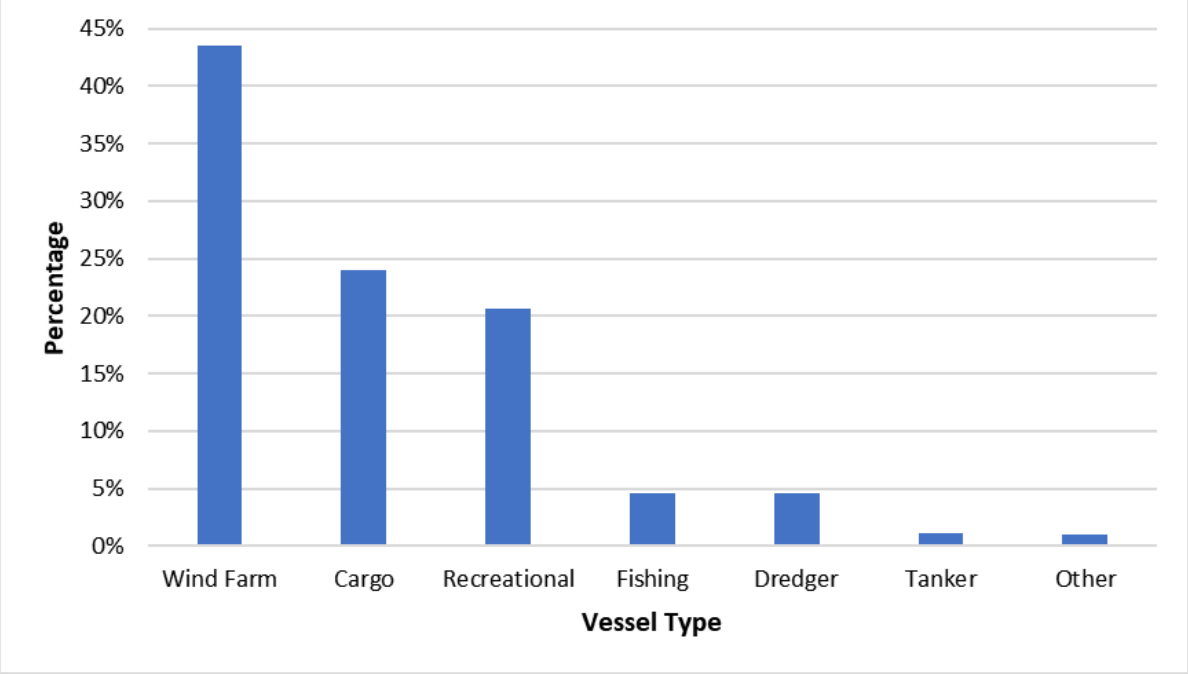

Figure E.26 Distribution of Vessel Types Intersecting Array Area

1049. Wind farm support vessels associated with the Greater Gabbard and Galloper offshore wind farms were the most common type of vessel to intersect the array area, accounting for 44% of intersections. This was followed by cargo vessels, which were generally recorded transiting northeast/southwest through the southern

portion of the array area, accounting for 24%. Recreational vessels accounted for 21% of intersections and were most commonly seen in southeast/northwest transit through the array area. Fishing vessels accounted for 5% of intersections, and mostly displayed signs of active fishing as opposed to being in transit. Dredgers also accounted for 5% of intersections; most of the dredger intersections occurred from dredgers transiting to the dredging area at the western extent of the study area (see section E.3.4.5).

1050. As shown in Figure 7-2, the Galloper Recommended Route for ferries is in place within the array area. The vessels recorded during the six-month period that transited along this route are presented in Figure E.27.

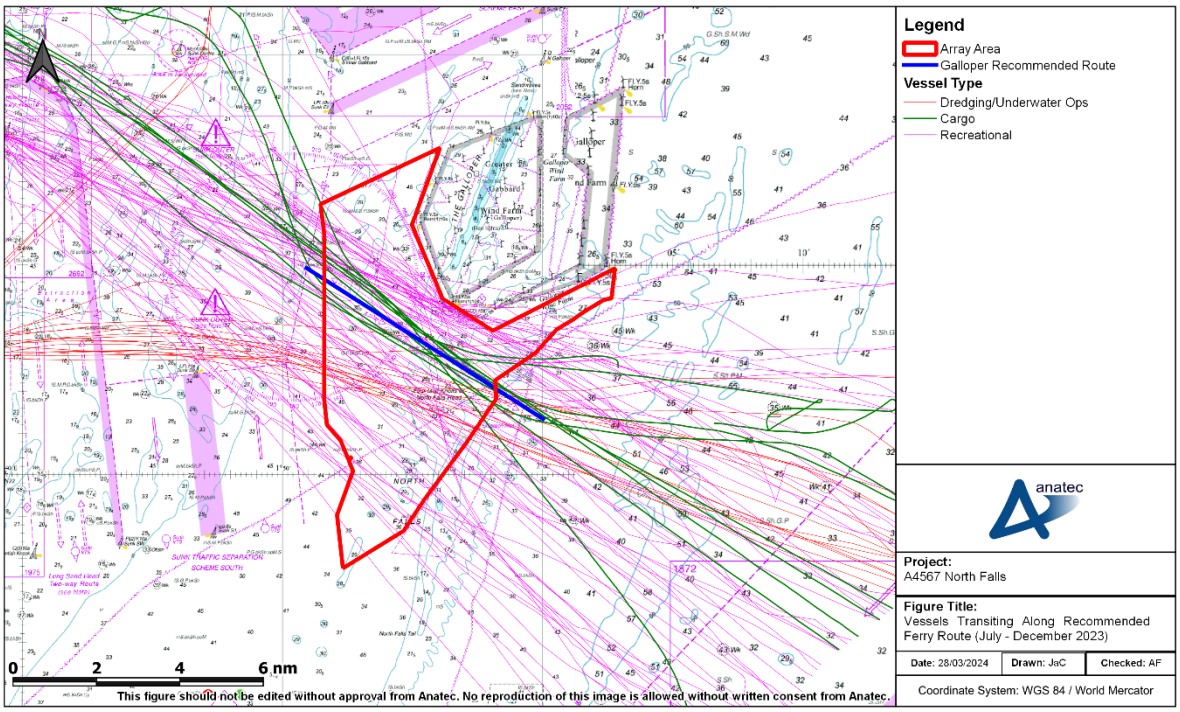

Figure E.27 Vessels Transiting Along Recommended Ferry Route (July – December 2023)

1051. A total of nine transits along the route from cargo vessels was observed during the six-month period, which corresponds to an average of 1-2 per month. These vessels were most commonly transiting between Rotterdam (the Netherlands) and Felixstowe (UK). Five of these transits were from RoRo vessels.

1052. Also shown in Figure E.27 are marine aggregate dredgers and recreational vessels, however it is noted that a conservative approach has been taken towards inclusion of this traffic, with the headings of certain vessels of these types indicating they may not have been intentionally using the Recommended Ferry Route. The marine aggregate dredgers shown were transiting to/from the coincident marine aggregate dredging areas at the western extent of the study area (see Figure E.16). Recreational traffic was slightly more dense northeast of the charted recommended route

compared to its southwest. A total of 16 such marine aggregate dredgers was recorded, corresponding to one every 11 to 12 days. A total of 88 such recreational vessels was recorded, corresponding to one every two days.

E.4 Summary

1053. This annex analysed six months (1 July 2023 – 31 December 2023) of vessel traffic data recorded within a 10nm buffer of the North Falls Offshore Wind Farm array area. An average of 132 vessels per day was recorded. The busiest month was July, with an average of 140 vessels per day.

1054. The shortest vessels (less than 25m) generally comprised wind farm support vessels associated with the Greater Gabbard and Galloper offshore wind farms as well as fishing vessels, pilot vessels and recreational vessels. The longest vessels (at least 325m) were comprised of commercial vessels mainly seen utilising the TSSs. The average vessel length was 157m. The longest vessels recorded were 400m container ships.

1055. The majority (57%) of vessels recorded within the study area during the six-month period were cargo. These vessels made regular use of the nearby TSSs. An average of 76 cargo vessels per day was recorded, with one to two per day through the array area.

1056. Tankers were also common, accounting for 24%. Tankers displayed patterns similar to cargo vessels. An average of 32 tankers per day was recorded, with one per month through the array area.

1057. An average of 13 wind farm support vessel transits per day was recorded, the majority of which was associated with Greater Gabbard and Galloper. One to two per day were seen within the array area.

1058. Marine aggregate dredgers were observed engaged in active aggregate dredging as well as dumping into spoil grounds and transiting within the TSSs. An average of four per day was recorded, with one a week through the array area.

1059. Recreational traffic was heavily seasonal with 95% of traffic recorded during July, August and September. During these three months, there was an average of six to seven per day within the study area and one to two per day within the array area. The remaining 5% of traffic recorded over October, November and December corresponded to an average frequency of one every three to four days with a total of three intersections through the array area.

1060. There was an average of three fishing vessels per day recorded with a total of 23 intersections through the array area which corresponds to an average of one every eight days. There was notable seasonal variation, with daily averages higher in winter compared to summer.

1061. An average of three passenger vessel transits per day was recorded, with two intersections through the array area (at its extremities). The eastbound lane of Sunk TSS East was used regularly by two RoPax vessels.

1062. The most common vessel types to intersect the array area were wind farm support vessels (44%), followed by cargo vessels (24%) and recreational vessels (21%). The only commercial vessels seen to use the Galloper Recommended Route were cargo vessels, of which there were nine.

Annex F Long term AIS Assessment (Six Months 2023) – Offshore Cable Corridor

F.1 Introduction

1063. This annex assesses AIS data recorded from onshore receivers during a six-month period from 1 July 2023 to 31 December 2023 (inclusive).

1064. It is noted that as part of the NRA process, key shipping and navigation stakeholders have noted consideration must be given to the impact of the offshore cable corridor given the sensitivity of the local area for surface navigation. Of particular note is the local presence of the Sunk routeing measures, the charted deep water routes, and the charted Sunk pilotage. On this basis the key objectives of this annex are:

- Provide up to date general assessment of vessel traffic relative to the offshore cable corridor within the defined study area; and
- Provide area specific assessment of the particularly sensitive areas for navigation.

F.2 Methodology

F.2.1 Study Area

1065. This annex has assessed the vessel traffic data within the same study area for the offshore cable corridor introduced in Section 3.4.

F.2.2 Data Period and Temporary Vessel Traffic

1066. The vessel traffic data assessed in this annex was collected from 1 July 2023 and 31 December 2023 inclusive.

1067. As per the vessel traffic surveys, a number of vessel tracks recorded during the data period were classified as temporary (non-routine) and have been excluded from the characterisation of the vessel traffic baseline. These tracks are presented in Figure F.1.

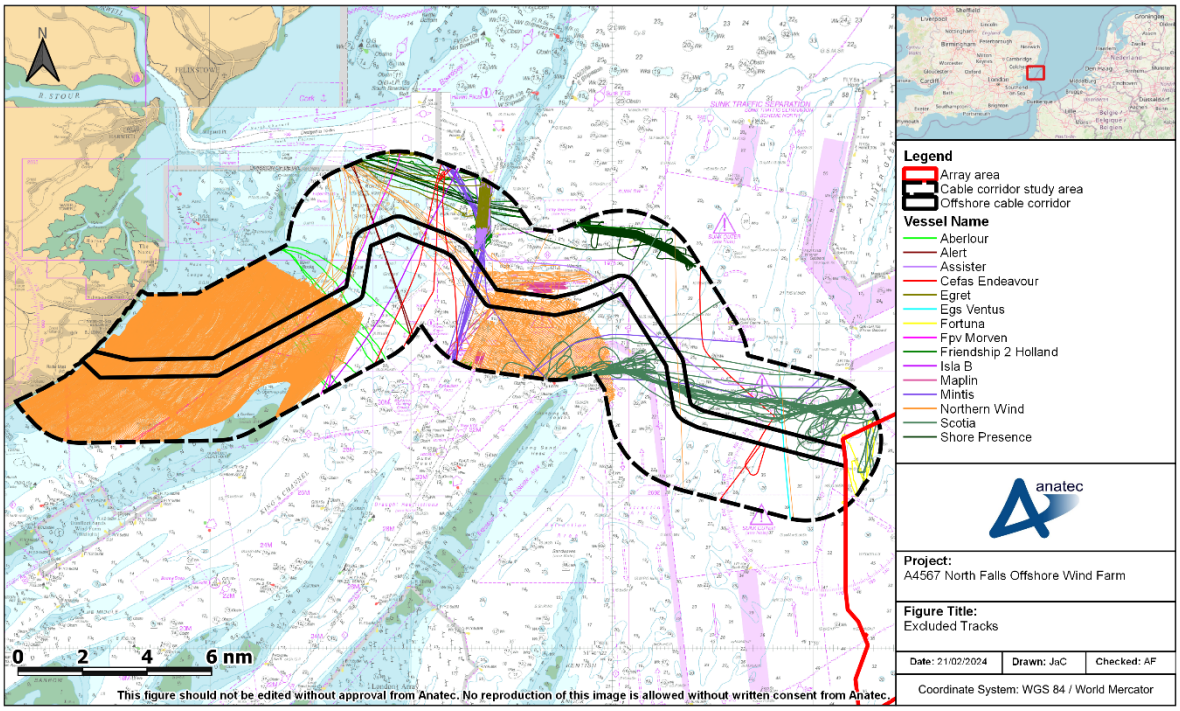

Figure F.1 Excluded Tracks

1068. It is noted that deepening of the Harwich Deep Water Channel to a new depth of 16m was completed on the 26 July 2023[14], allowing vessels of deeper draught to pass through (which can be seen in Figure F.21). Excluded traffic within the Harwich Deep Water Channel includes survey work and bed-levelling activity.

1069. It is noted that excluded traffic also includes geophysical survey work relating to the Sea Link cable.

F.2.3 AIS Carriage

1070. General limitations associated with the use of AIS data (for example, carriage requirements) are discussed in full within section 5.4.1.

F.3 Long-Term Vessel Traffic Movements

1071. This section provides an overview of vessel traffic movements within the cable corridor study area (as defined in Section 3.4) in terms of counts, types and sizes.

F.3.1 Vessel Counts

1072. Figure F.2 presents the daily average number of vessels recorded broken down by both vessel type and month.

[14] See Notice to Mariners.

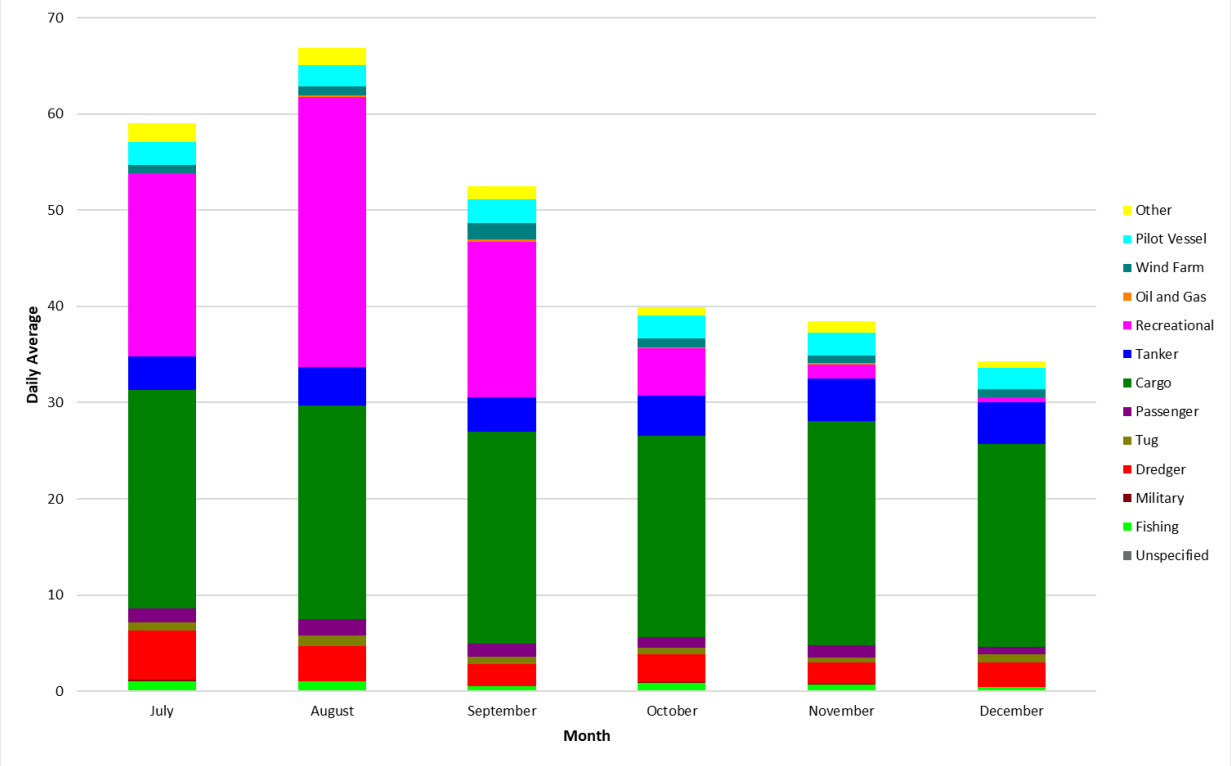

Figure F.2 Daily Average Vessel Counts per Vessel Type per Month

1073. It can be seen that recreational traffic displayed a large amount of seasonality, with the majority (90%) being recorded during July, August and September. The other vessel types were recorded in relatively consistent levels during each month and therefore recreational traffic was the main contributor to the variation in overall traffic levels. Further details on main vessel types, including their individual counts, can be found in section F.3.2.

1074. There was a daily average of 48 to 49 unique vessels recorded within the cable corridor study area during the six-month period. The busiest month was August, with a daily average of 67 vessels. The quietest month was December, with a daily average of 34 to 35 vessels.

F.3.2 Vessel Types

1075. This section breaks the vessel traffic down in terms of vessel type, with subsection F.3.2.1 presenting an overview of all types followed by subsections analysing each main vessel type in more detail.

F.3.2.1 Overview

1076. Figure F.3 presents the vessel traffic recorded within the cable corridor study area during the six-month period, colour-coded by vessel type. Following this, Figure F.4 presents the percentage breakdown of vessel traffic by the main vessel types. A single vessel was of unknown type and is excluded from the percentage breakdown.

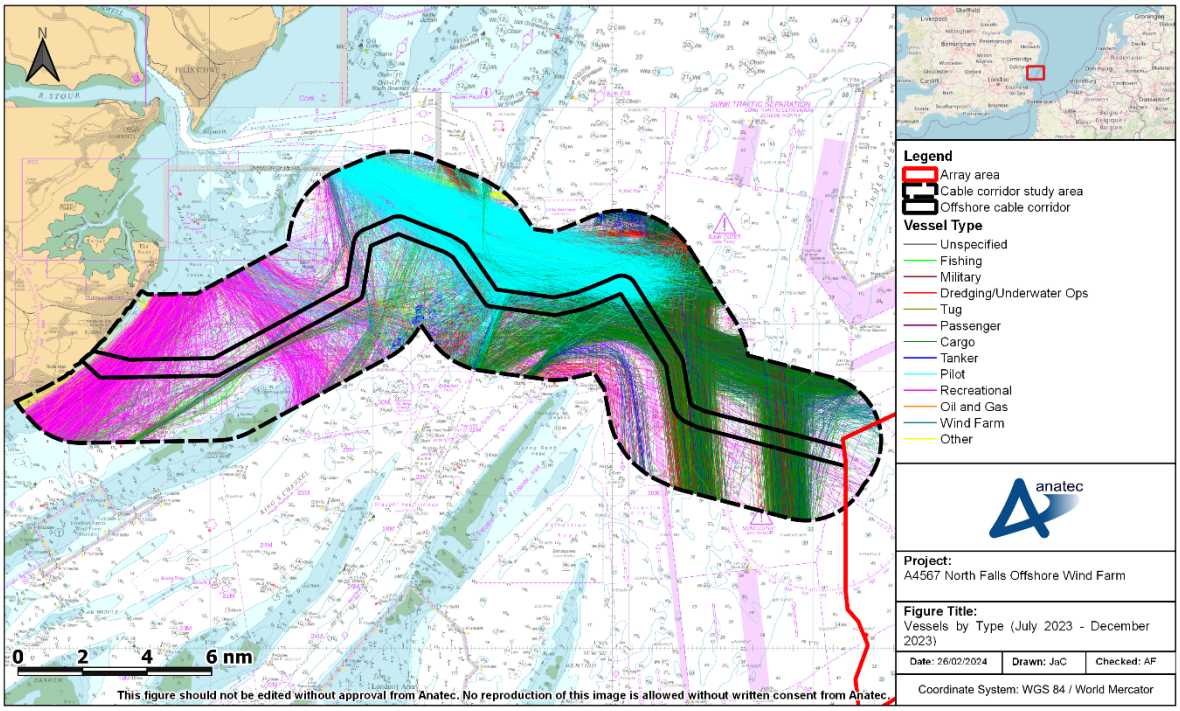

Figure F.3 Vessels by Type (July 2023 – December 2023)

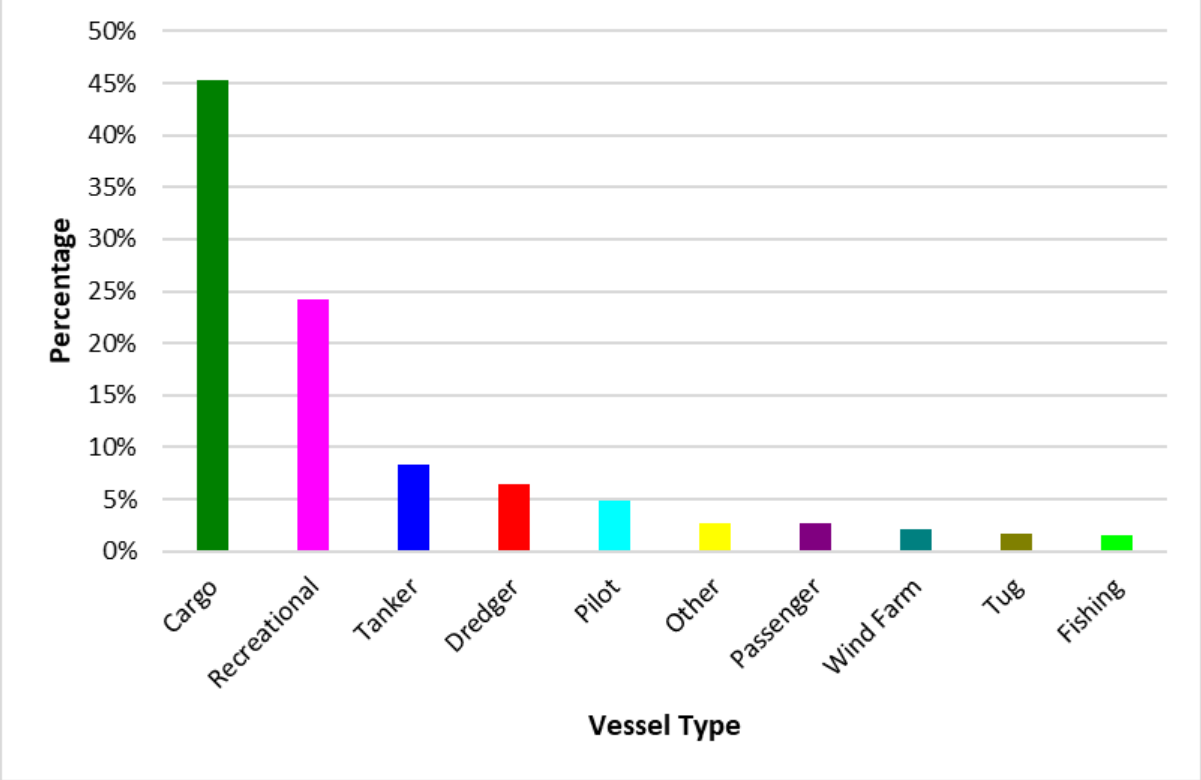

Figure F.4 Distribution of Main Vessel Types (July 2023 – December 2023)

1077. The most common vessel type recorded within the cable corridor study area during the six-month period was cargo (which accounted for 45%), noting proximity to key commercial ports. The next most common vessel type was recreational vessels (which accounted for 24%), mainly seen close to shore.

1078. Vessels in the 'other' category included lifeboats, multi-purpose vessels and buoy-laying vessels. Oil and gas vessels and military vessels were also recorded in low numbers (each accounting for less than 1%).

1079. The following subsections present detailed analysis of the main vessel types.

F.3.2.2 Cargo Vessels

1080. Figure F.5 presents a plot of cargo vessels recorded within the cable corridor study area during the six-month period, colour-coded by subtype.

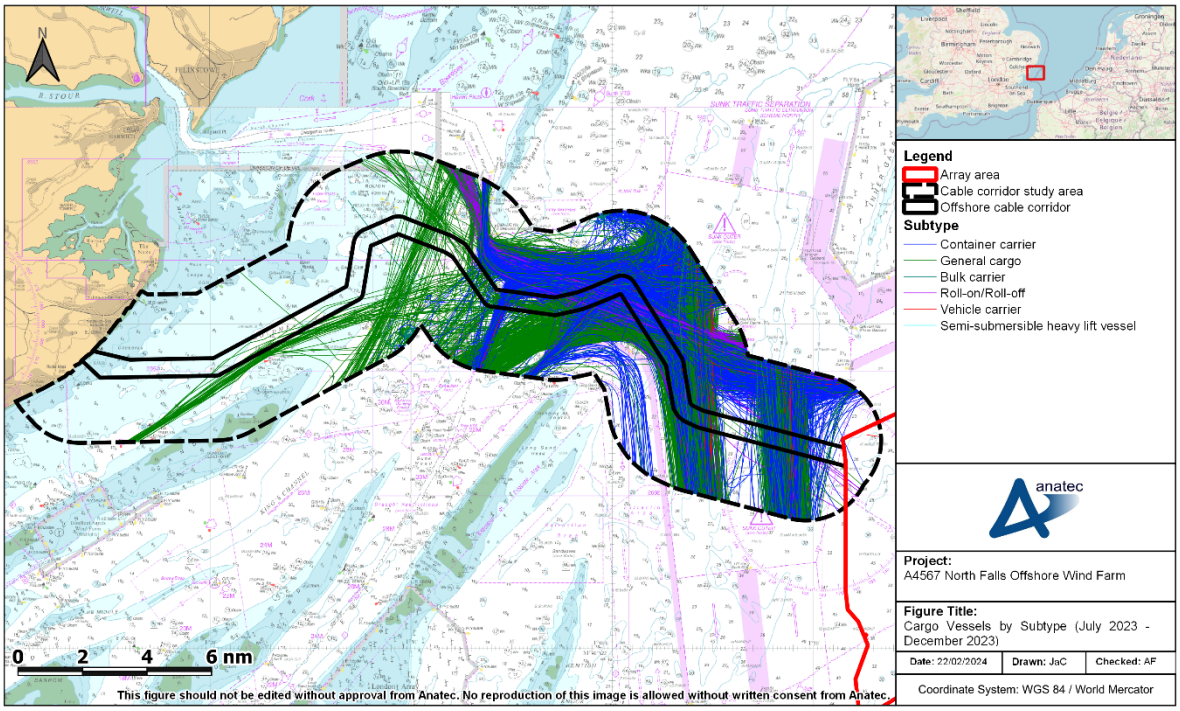

Figure F.5 Cargo Vessels by Subtype (July 2023 – December 2023)

1081. Cargo vessels were mainly seen using the Sunk Traffic Separation Schemes (TSSs) (i.e. Sunk TSS North, Sunk TSS South and Sunk TSS East) as well as entering/exiting the Sunk Inner Precautionary Area via the Sunk, Trinity and Harwich Deep Water routes and Harwich Deep Water Channel. A smaller proportion of cargo vessels (generally container carriers) were also seen using the Long Sand Head route. Further information about the sizes of these vessels can be found in section F.3.3.1.

1082. Common destinations included the Thames, Felixstowe and Rotterdam.

1083. The most common type of cargo vessel recorded within the cable corridor study area during the six-month period was container carrier, accounting for 47%, followed by general cargo (38%), bulk carrier (7%) and Roll-on/Roll-off (RoRo) (6%).

1084. An average of 22 unique cargo vessels per day was recorded within the cable corridor study area during the six-month period.

F.3.2.3 Recreational Vessels

1085. Figure F.6 presents a plot of recreational vessels recorded within the cable corridor study area during the six-month period, colour-coded by month.

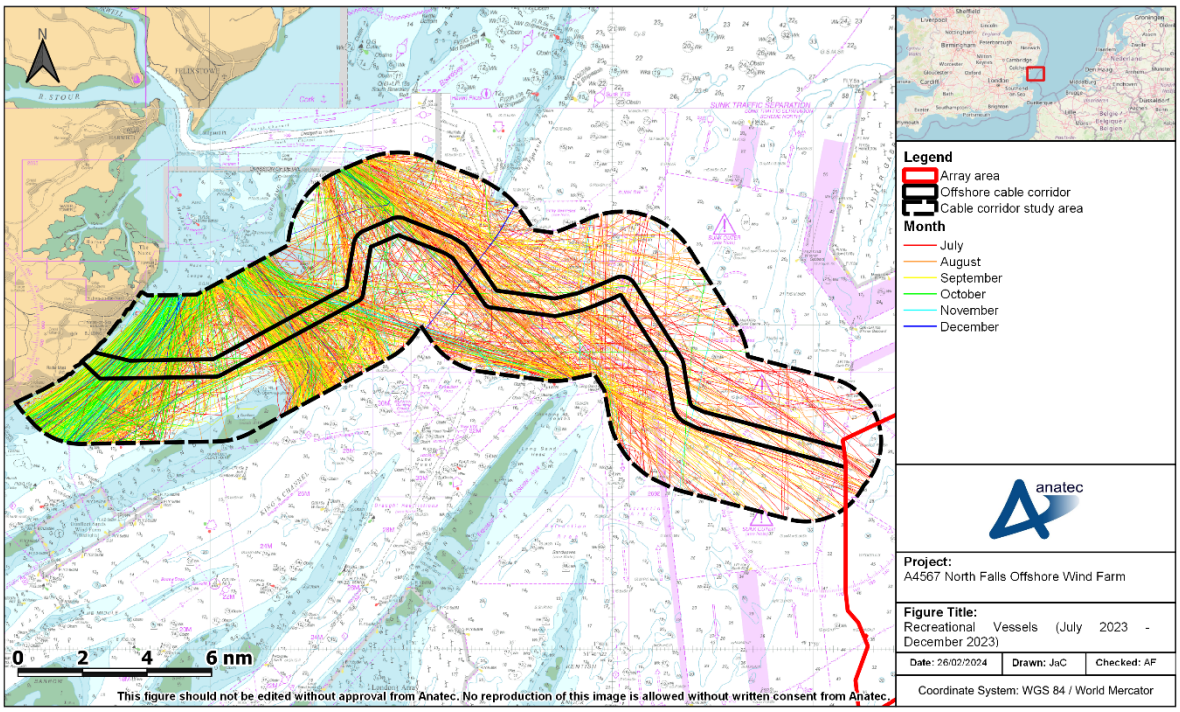

Figure F.6 Recreational Vessels by Month (July 2023 – December 2023)

1086. Traffic was weighted towards the coast, with over half (approximately 53%) recorded within 3nm of shore. This traffic is shown in more detail in Figure F.7.

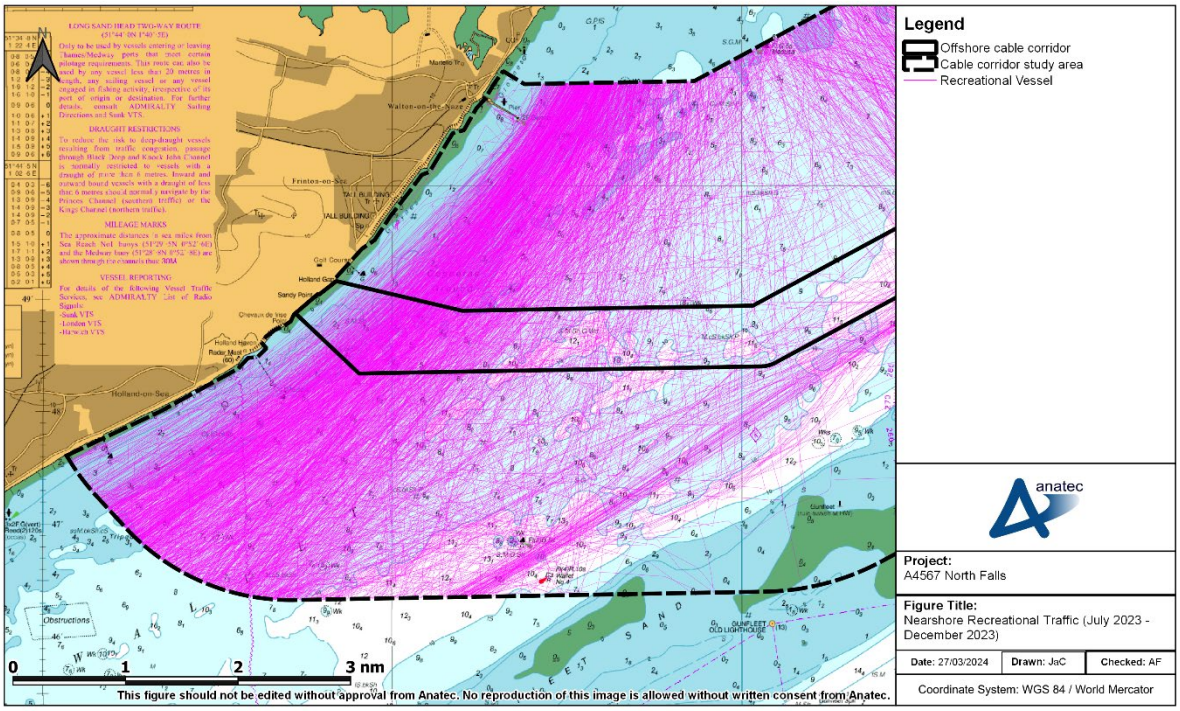

Figure F.7 Nearshore Recreational Traffic (July 2023 – December 2023)

1087. This traffic generally corresponds to water depths of below 10m as per Chart Datum (CD), with a significant proportion corresponding to water depths below 5m.

1088. Recreational traffic transiting northwest/southeast slightly further offshore is also noted and were likely heading to/from harbours and marinas located further north via the mouth of the Stour and Orwell Estuaries. Recreational vessels further offshore are considered likely to be intercontinental between the UK and mainland Europe.

1089. The majority (90%) of recreational traffic was recorded during July, August and September; there was an average of 21 recreational vessels recorded per day over the course of these three months. Over the course of October, November and December, there was an average of two to three per day.

F.3.2.4 Tankers

1090. Figure F.8 presents a plot of tankers recorded within the cable corridor study area during the six-month period, colour-coded by subtype.

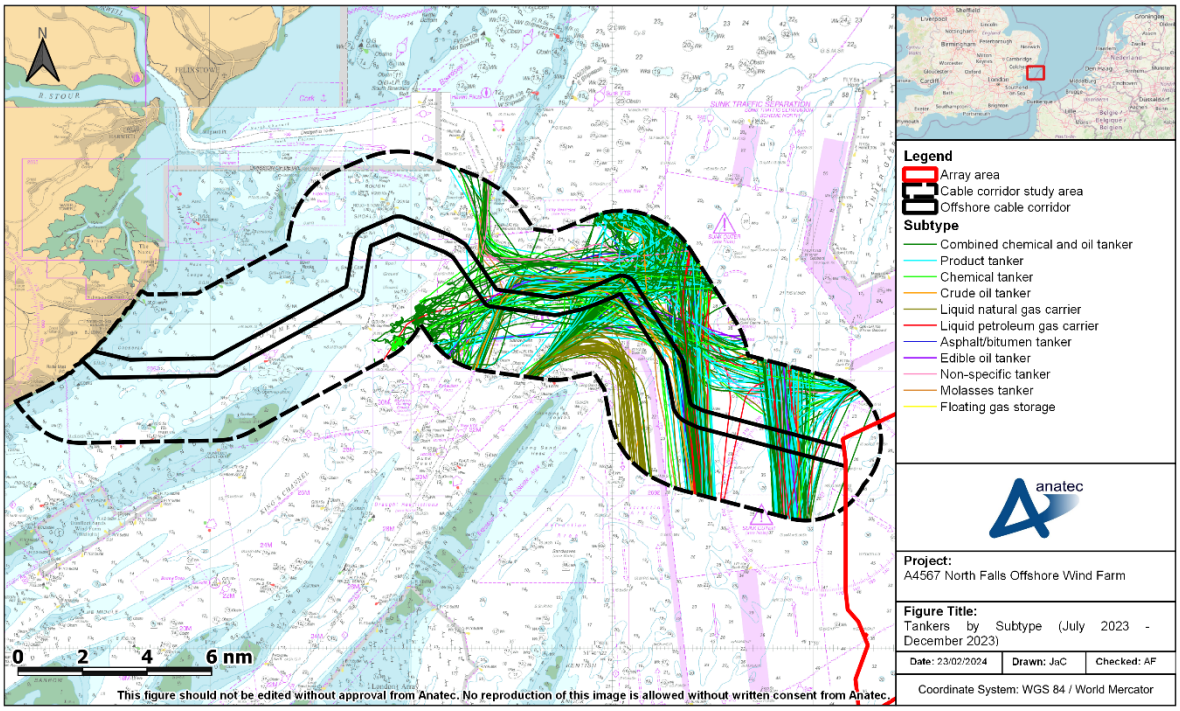

Figure F.8 Tankers by Subtype (July 2023 – December 2023)

1091. Tankers were commonly seen using the Sunk TSSs (i.e. Sunk TSS North, Sunk TSS South and Sunk TSS East) as well as entering/exiting the Sunk Inner Precautionary Area via the Sunk, Trinity and Harwich Deep Water routes and Harwich Deep Water Channel. A proportion were also seen (mainly Liquid Natural Gas (LNG) carriers) using the Long Head Sand route. It is noted that tankers were entirely recorded within the eastern half of the cable corridor study area, avoiding the water depths of below 10m that are found closer to shore as per CD. Further information about the sizes of these vessels can be found in section F.3.3.2.

1092. Common destinations included the Thames, Immingham and Teesport.

1093. The most common type of tanker recorded within the study area during the six-month period was combined chemical and oil, accounting for 42%. This was followed by product tankers (29%), chemical tankers (9%), LNG carriers (6%), Liquid Petroleum Gas (LPG) carriers (6%), crude oil tankers (3%), asphalt/bitumen tankers (2%) and edible oil tankers (1%).

1094. An average of four unique tankers per day was recorded within the cable corridor study area during the six-month period.

F.3.2.5 Marine Aggregate Dredgers

1095. Figure F.9 presents a plot of marine aggregate dredgers recorded within the cable corridor study area during the six-month period. Also shown are the nearby marine aggregate dredging areas and spoil grounds.

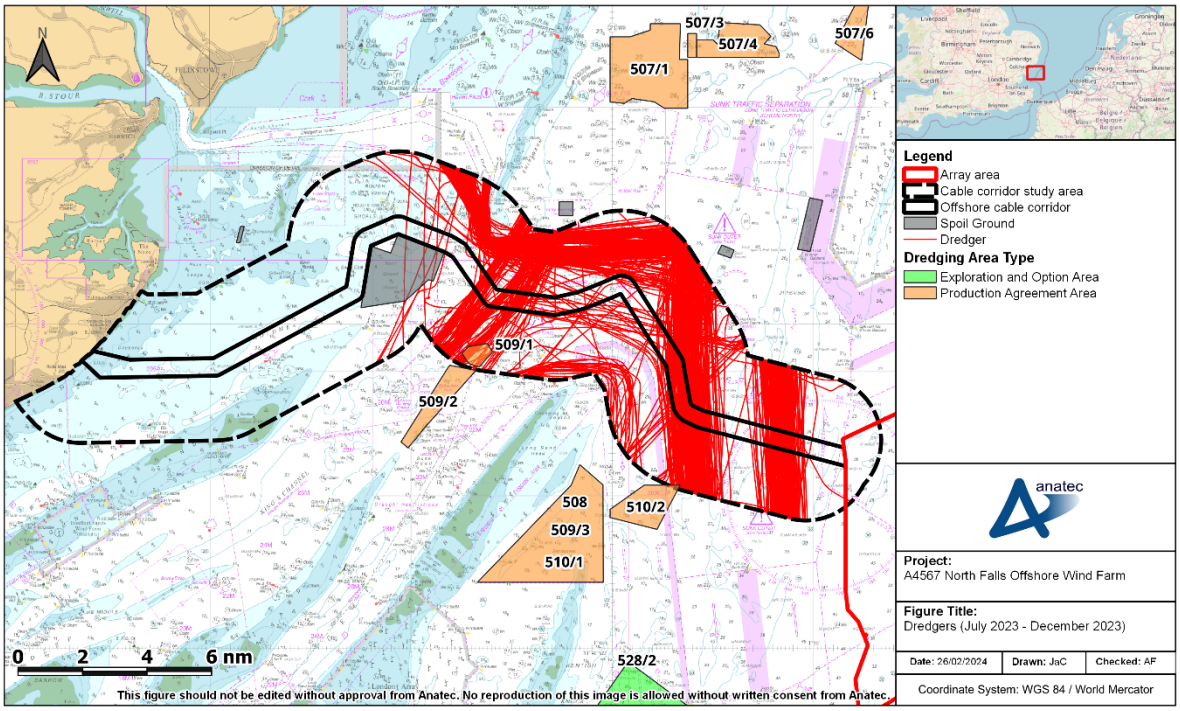

Figure F.9 Dredgers (July 2023 – December 2023)

1096. Dredgers were commonly seen making use of Sunk TSS North and Sunk TSS South in both directions. Dredgers were also commonly seen transiting east/west, to the north of the offshore cable corridor, as they travelled between the Harwich Deep Water Channel and the spoil grounds to the east of the cable corridor study area.

1097. As with tankers (see section F.3.2.4), marine aggregate dredgers were distributed to the eastern half of the cable corridor study area in deeper waters, avoiding the shallower waters closer to coast. Although licensed areas 509/1 and 510/2 intersect the cable corridor study area, no active dredging was recorded, and all vessels were on transit.

1098. An average of three unique marine aggregate dredgers per day was recorded within the cable corridor study area during the six-month period.

F.3.2.6 Pilot Vessels

1099. Figure F.10 presents a plot of the pilot vessels recorded within the cable corridor study area during the six-month period. Following this, Figure F.11 shows a density plot of the same data within a 500m x 500m grid. The charted locations of the nearby pilot stations are also shown in each figure.

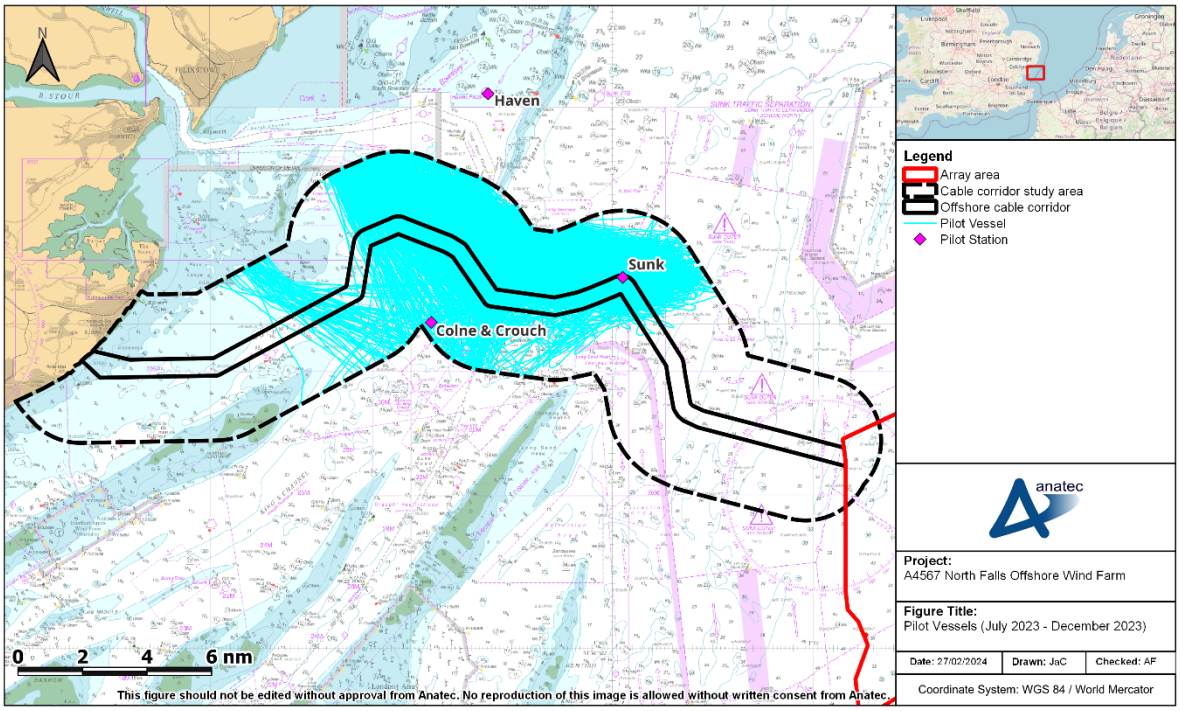

Figure F.10 Pilot Vessels (July 2023 – December 2023)

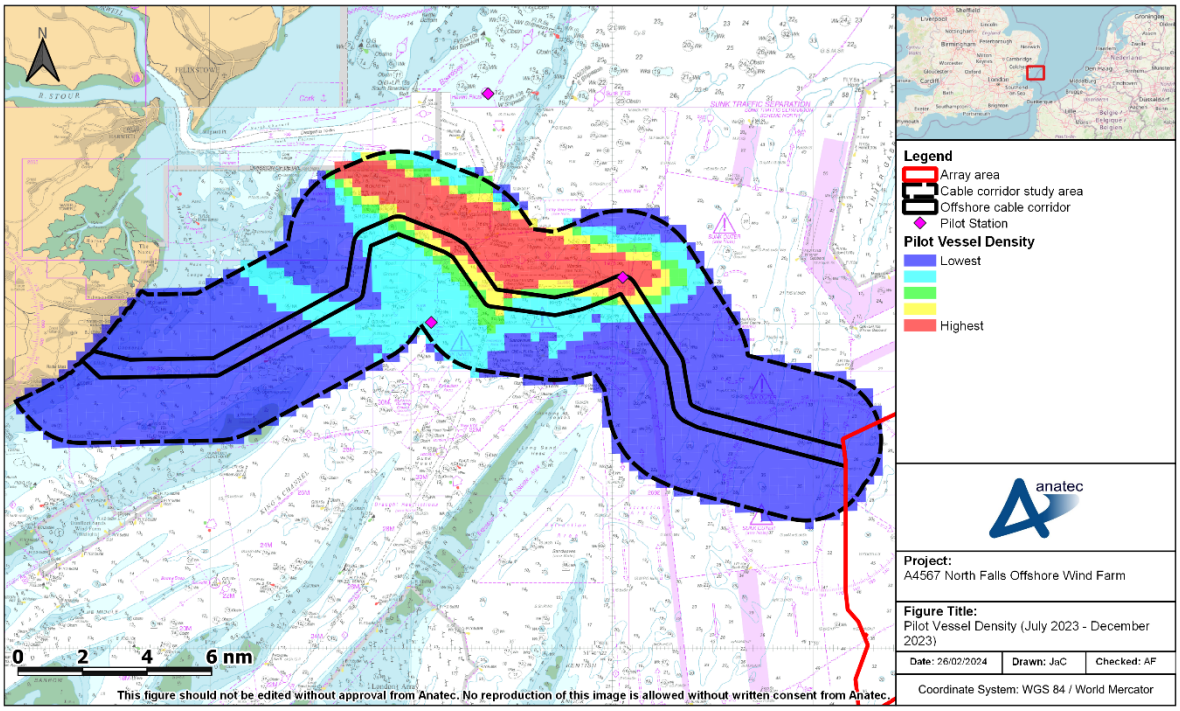

Figure F.11 Pilot Vessel Density (July 2023 – December 2023)

1100. It can be seen from Figure F.11 that pilot vessel density was at its highest leading up to the Sunk Pilot Station; the majority of this high-density region was located to the north of the offshore cable corridor. Pilot vessels were also seen transiting to/from

the Colne and Crouch pilot station to the south of the offshore cable corridor, accounting for a small minority.

1101. A daily average of 16 transits either to or from the Sunk Pilot Station area was observed by pilot vessels during the six-month period, which corresponds to an average of eight round-trips per day.

1102. Figure F.12 presents an example of an interaction at Sunk Pilot Station between a pilot vessel and an inbound tanker. The precise port of boarding cannot be determined from the data, however it was estimated to occur between 600m and 1,200m from the position on the chart marking the location of the station. The tanker ultimately travelled southward and arrived at South Stifford port within the Thames.

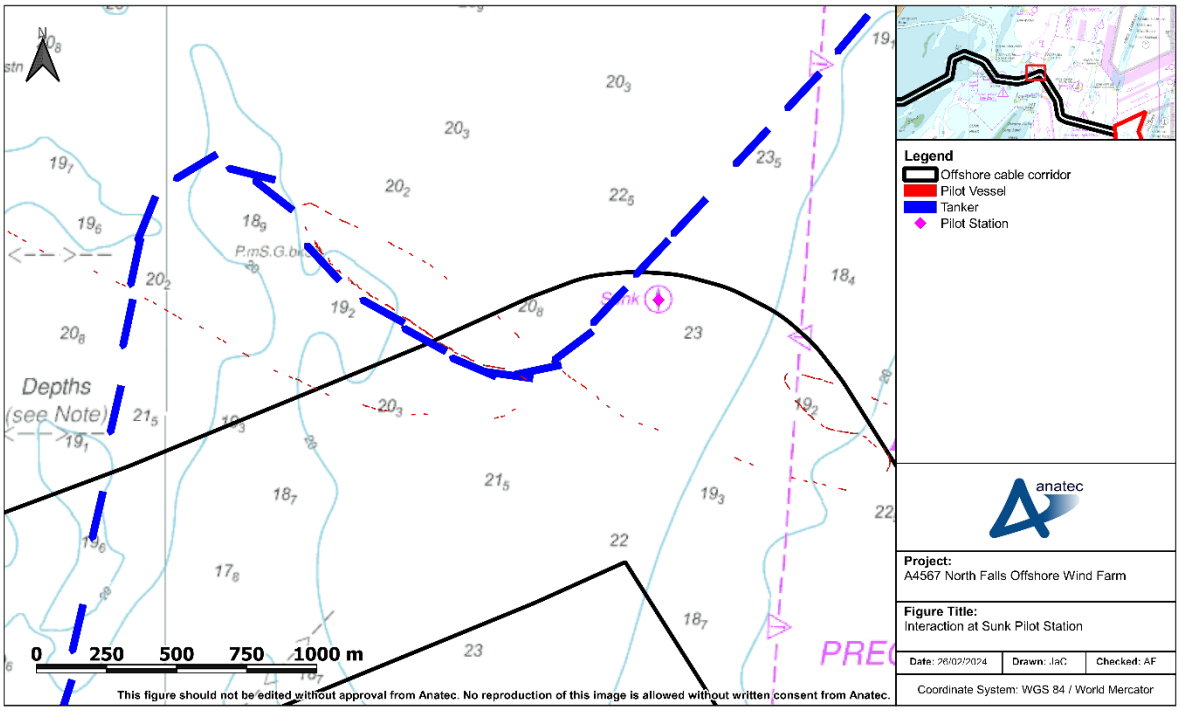

Figure F.12 Interaction at Sunk Pilot Station

F.3.2.7 Passenger Vessels

1103. Figure F.13 presents a plot of passenger vessels recorded within the cable corridor study area during the six-month period, colour-coded by subtype. Note that yachts that are above 24 metres (m) in length are not classed as recreational and are instead classed as passenger.

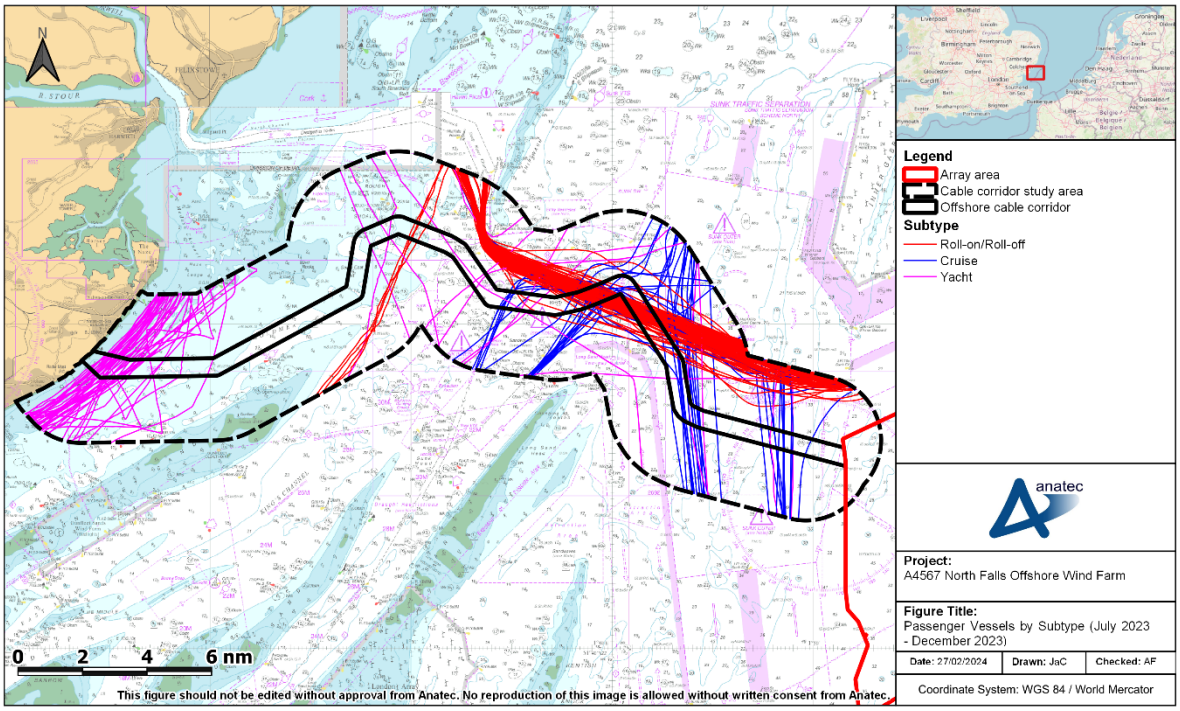

Figure F.13 Passenger Vessels by Subtype (July 2023 – December 2023)

1104. The majority of passenger vessels recorded within the cable corridor study area during the six-month period were of type Roll-on/Roll-off Passenger (RoPax). RoPax traffic mainly consisted of two vessels operated by Stena Line, both of which transit between Harwich and Hook of Holland. As these vessels travelled outbound from Harwich, one of the two utilised the Harwich Deep Water Channel while the other passed adjacent. Both vessels then transited eastward, through the offshore cable corridor, to the eastbound lane of Sunk TSS East. The traffic inbound to Harwich passes further north, avoiding the cable corridor study area.

1105. The remainder consisted of passenger cruise ships and large yachts. Cruise ships were seen utilising Sunk TSS North and Sunk TSS South in both directions as well as the Sunk and Trinity Deep Water routes (further information on the vessels that use the Deep Water routes can be found in section F.3.3.2). Yachts were most commonly seen close to the coast.

1106. An average of one to two unique passenger vessels per day was recorded within the cable corridor study area during the six-month period.

F.3.3 Vessel Sizes

1107. This section presents vessel traffic breakdown in terms of vessel length and vessel draught.

F.3.3.1 Vessel Length

1108. Figure F.14 presents the vessels recorded within the cable corridor study area, colour-coded by vessel length. A valid vessel length was available for approximately 99% of vessels.

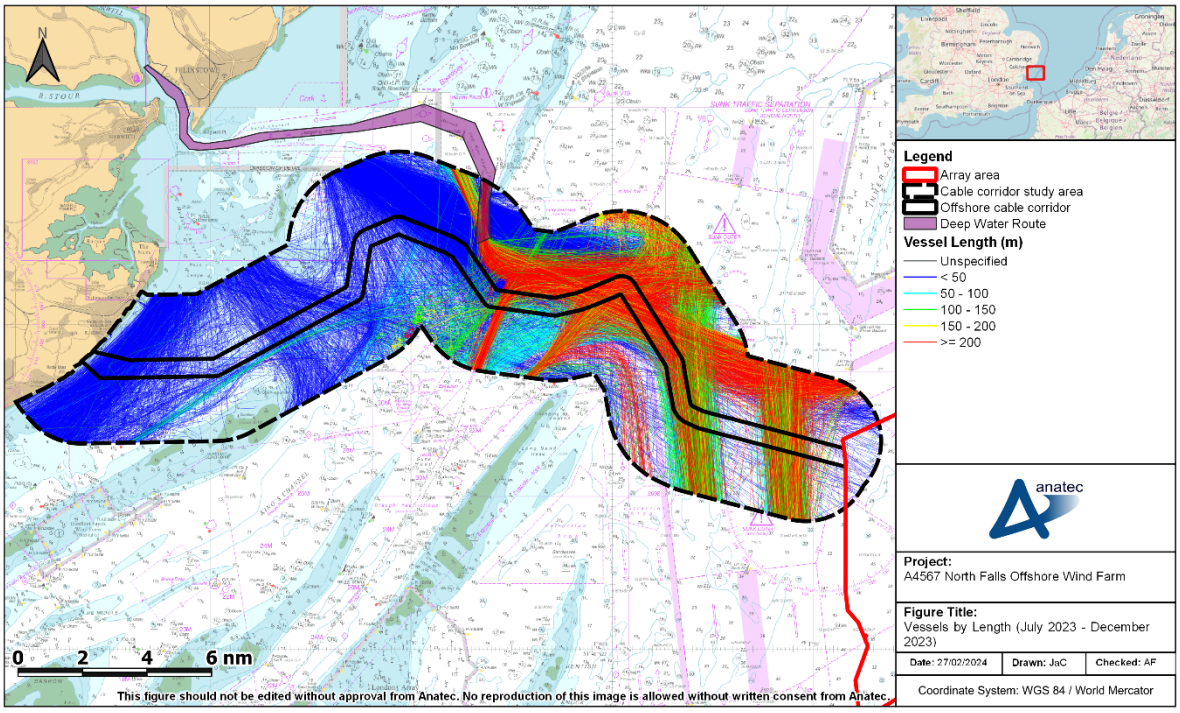

Figure F.14 Vessels by Length (July 2023 – December 2023)

1109. The shortest vessels (less than 50m) were seen throughout the cable corridor study area, with the majority being recreational and the remainder including pilot vessels, fishing vessels, wind farm vessels and tugs. Longer vessels (at least 200m) were mainly container ships seen utilising the Sunk TSSs, the Harwick Deep Water Channel and deep water routes within the Sunk Inner Precautionary Area (Sunk Deep Water Route and Trinity Deep Water Route).

1110. The distribution of vessel lengths is presented in Figure F.15.

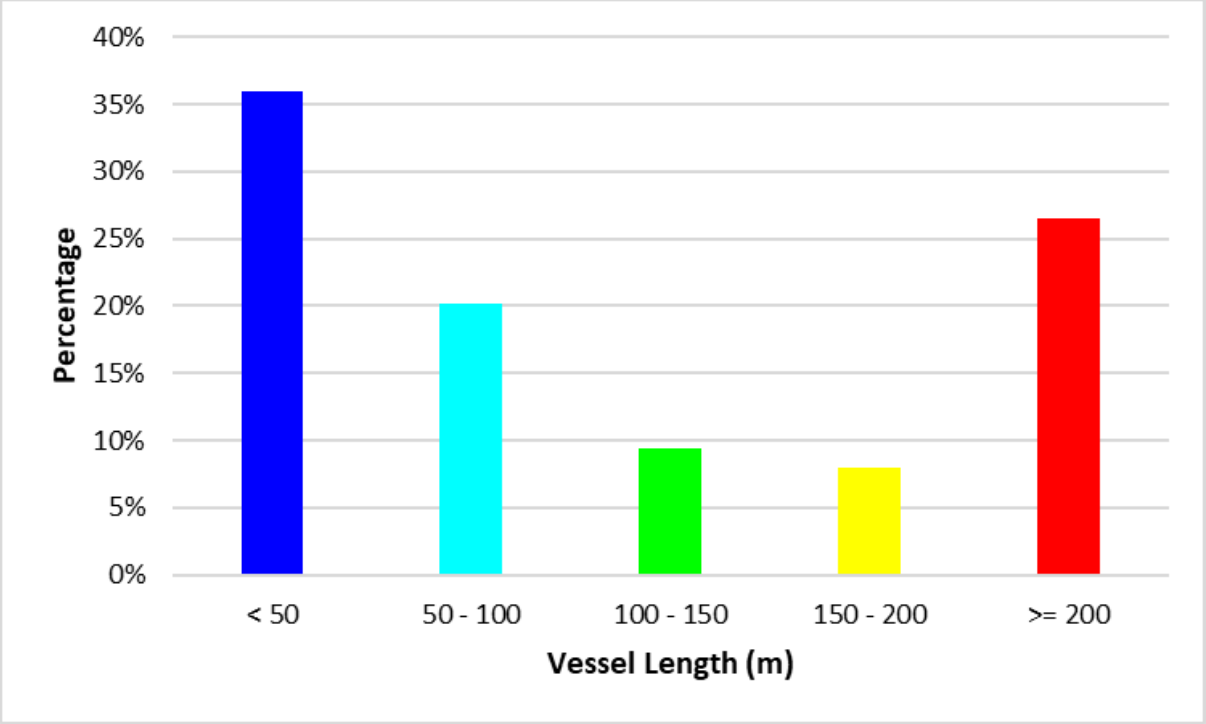

Figure F.15 Distribution of Vessel Lengths (July 2023 – December 2023)

1111. The average length recorded was 127m. The longest recorded vessels were 400m container ships, the majority of which were seen entering/exiting Harwich Deep Water Channel.

1112. Figure F.16 presents the commercial vessels (i.e., passenger vessels, cargo vessels and tankers) recorded within the cable corridor study area, colour-coded by vessel draught. The Harwich Deep Water Channel is also shown.

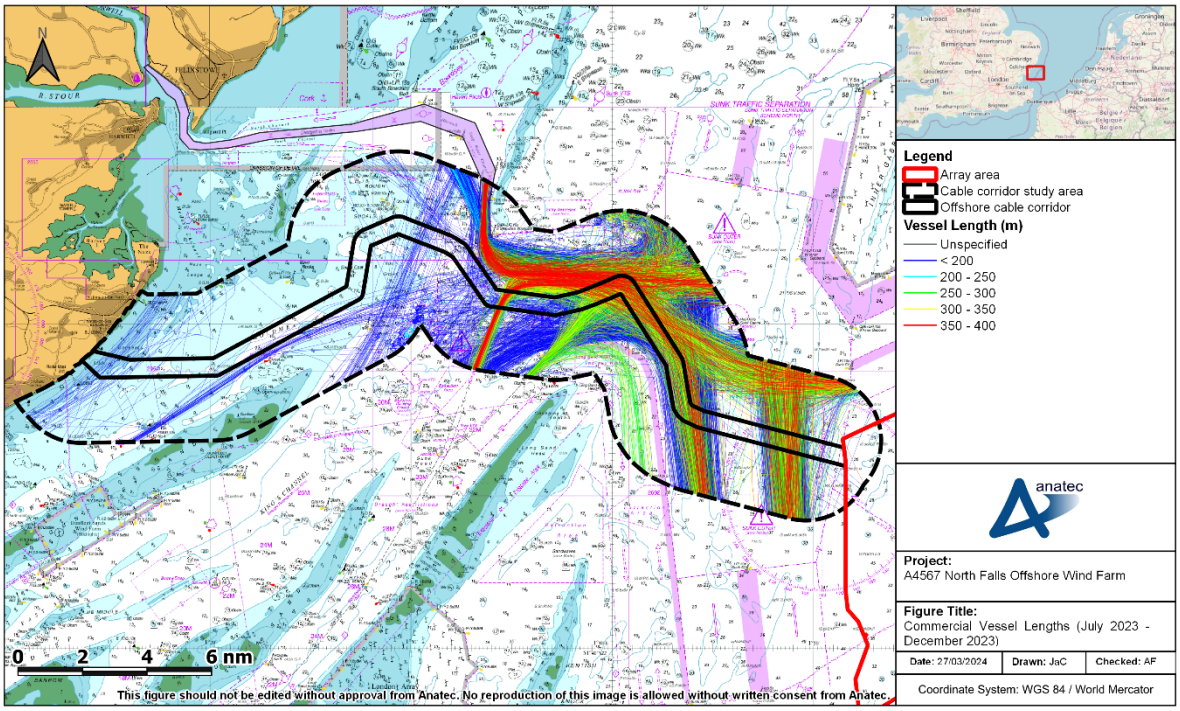

Figure F.16 Commercial Vessel Lengths (July 2023 – December 2023)

1113. Figure F.17 presents a more detailed overview of those vessels whose length is at least 350m.

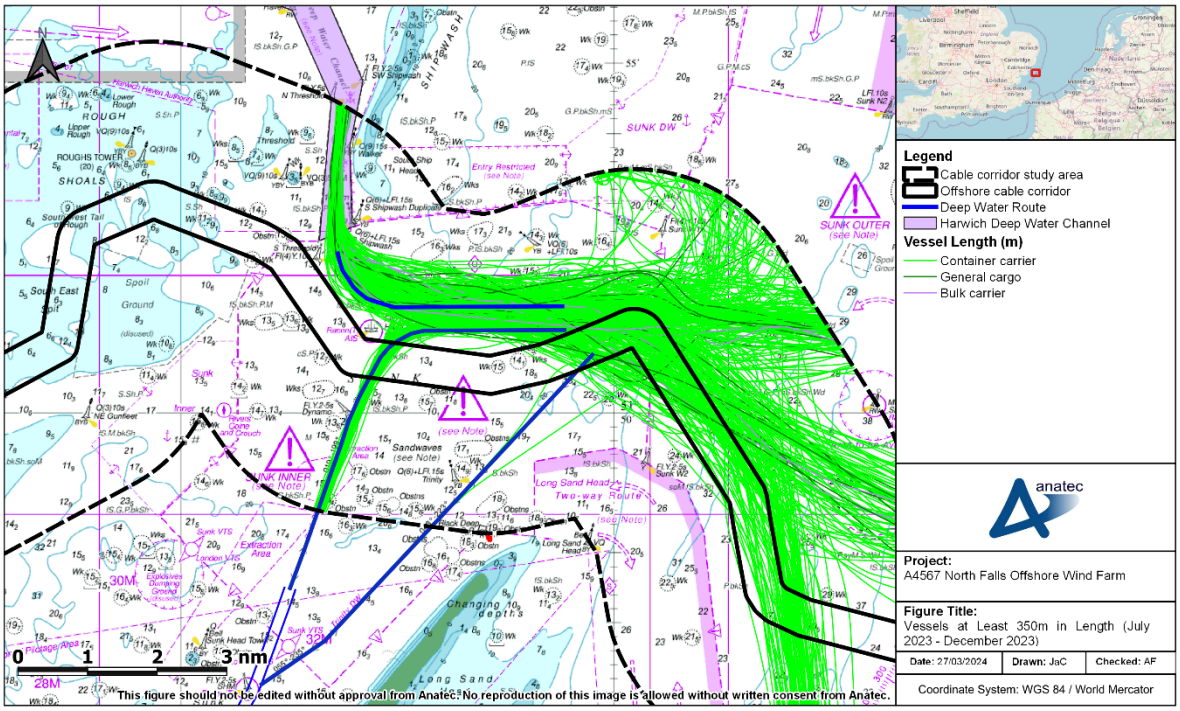

Figure F.17 Vessels at Least 350m in Length (July 2023 – December 2023)

1114. The longest vessels, as can be seen in Figure F.17, were generally container carriers (accounting for 96%) and were observed to generally utilise the Harwich Deep Water Channel and Harwich Deep Water route as well as the Sunk Deep Water route.

F.3.3.2 Vessel Draught

1115. Figure F.18 presents the vessels recorded within the cable corridor study area, colour-coded by vessel draught. The boundary of the Harwich Deep Water Channel is also shown.

1116. Vessel draught was available for approximately 75% of tracks. The majority of vessels with unspecified draught were recreational vessels and likely had shallow draught.

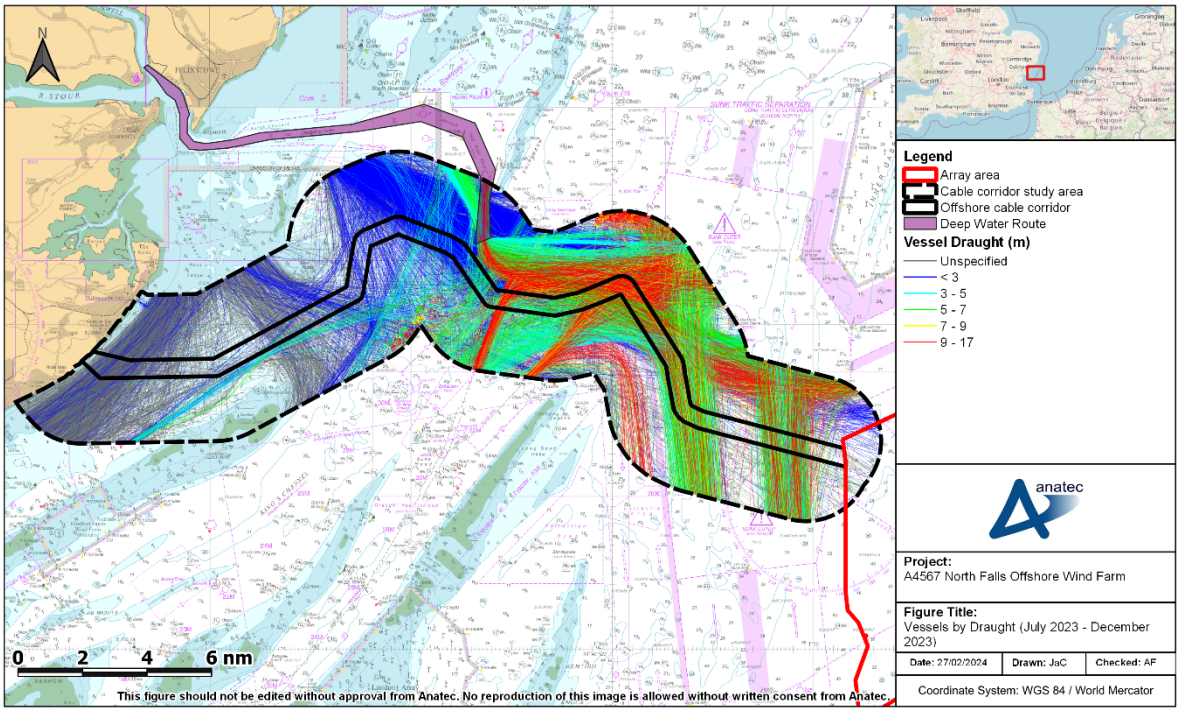

Figure F.18 Vessels by Draught (July 2023 – December 2023)

1117. Similar to the geographic distribution of vessel lengths (see section F.3.3.1), the shallowest draughts (less than 3m) were seen throughout the cable corridor study area. These vessels were typically pilot vessels and wind farm support vessels. As above, it is noted that unspecified draughts were typically broadcast by recreational vessels whose draughts were likely shallow.

1118. Vessels with deeper draught (at least 9m) were commonly seen utilising the Sunk TSSs, Harwich Deep Water Channel and the deep water routes within the Sunk Inner Precautionary Area. They were also seen using Sunk Deep Water Anchorage and Sunk Inner Anchorage Area (see section F.3.5). Vessels with these draughts were most commonly container ships.

1119. The distribution of vessel draughts is presented in Figure F.19.

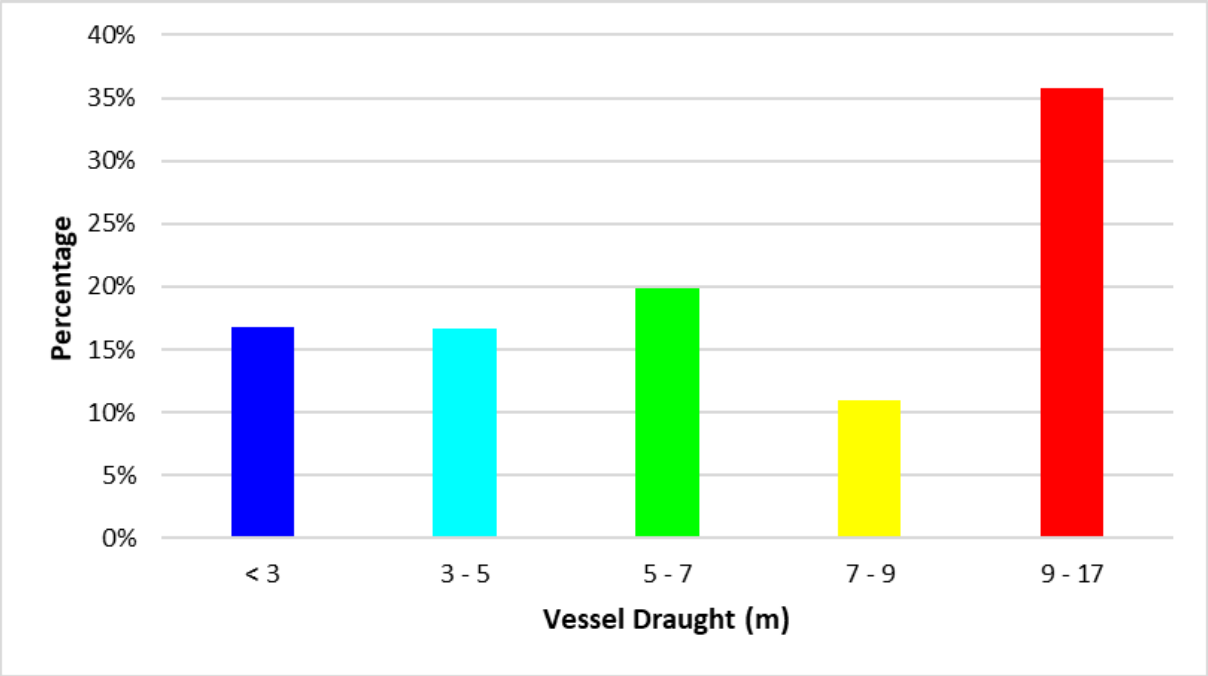

Figure F.19 Distribution of Vessel Draughts (July 2023 – December 2023)

1120. The average vessel draught (excluding unspecified draughts) recorded was 7.0m. The deepest draught recorded was 16.9m from a 399m container ship leaving the Harwich Deep Water Channel and entering Sunk TSS South.

1121. Figure F.20 presents the commercial vessels (i.e., passenger vessels, cargo vessels and tankers) recorded within the cable corridor study area, colour-coded by vessel draught. The Harwich Deep Water Channel is also shown.

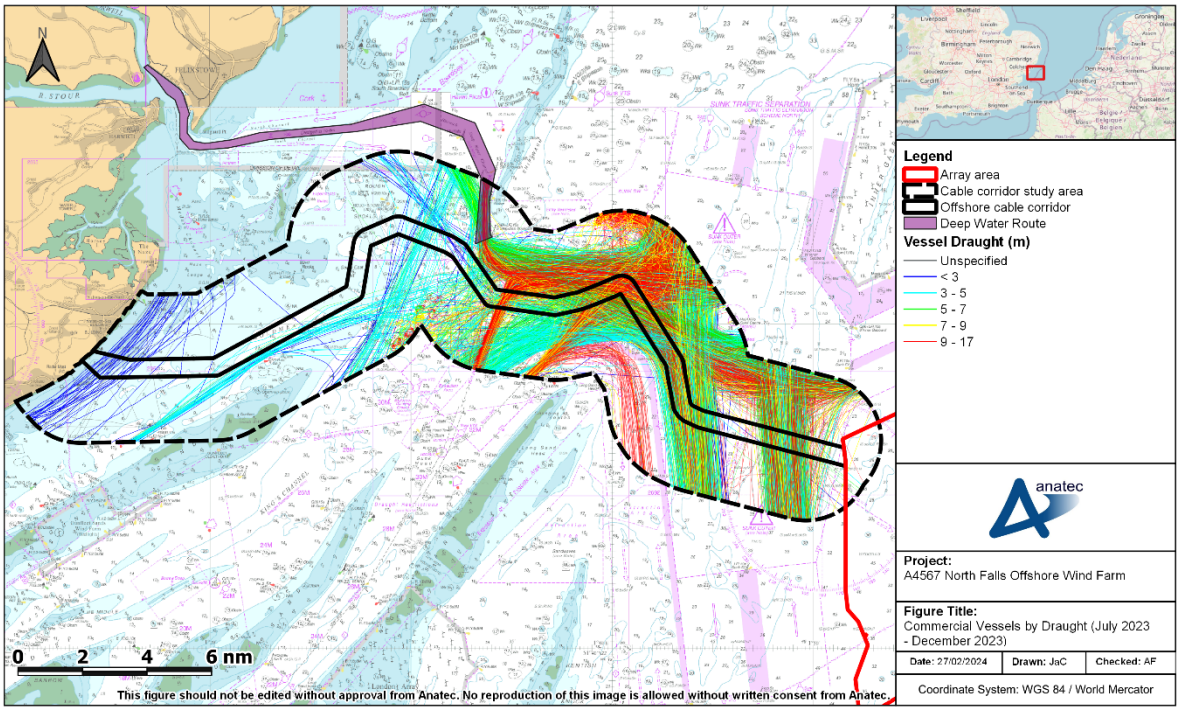

Figure F.20 Commercial Vessels by Draught (July 2023 – December 2023)

1122. A more detailed overview of the vessel tracks with the deepest draughts is shown in Figure F.21, alongside the boundary of the Harwich Deep Water Channel. The draughts of the vessel tracks shown in this figure are of at least 13.5m, and represent the top 5% of draught values.

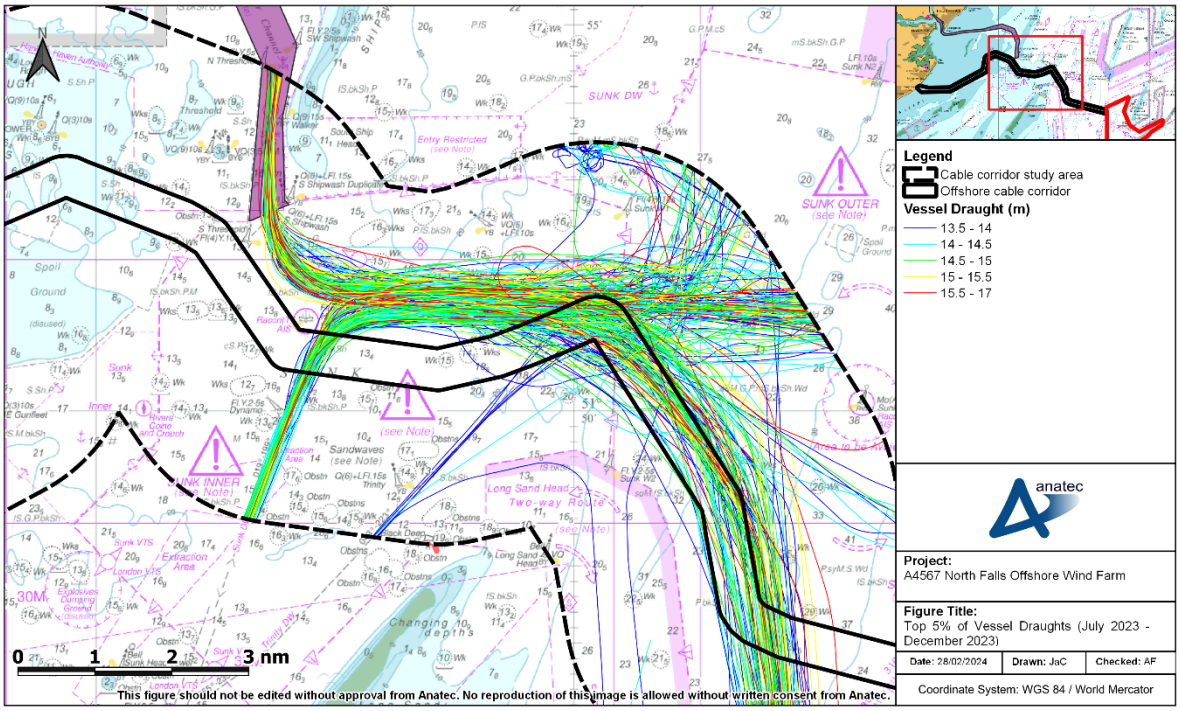

Figure F.21 Top 5% of Vessel Draughts (July 2023 – December 2023)

1123. The majority (76%) of vessel tracks with these draughts were from container carriers. These vessels were mainly seen entering/exiting the Harwich Deep Water Channel and using the Sunk Deep Water Route, avoiding the shallow banks (10m contours) closer to shore.

1124. Eight vessels (six tankers and two cargo vessels) with deep draught were also seen anchored within the Sunk Deep Water anchorage area during the six-month period; the draughts of these vessels ranged from 13.5m to 14.5m. See section F.3.5 for further details on all anchored vessels recorded within the cable corridor study area.

Deep Water Routes

1125. The data presented in Figure F.20 is presented again in Figure F.22, colour-coded by draught, with a focus on commercial vessels that have a draught of at least 12m utilising the Deep Water routes.

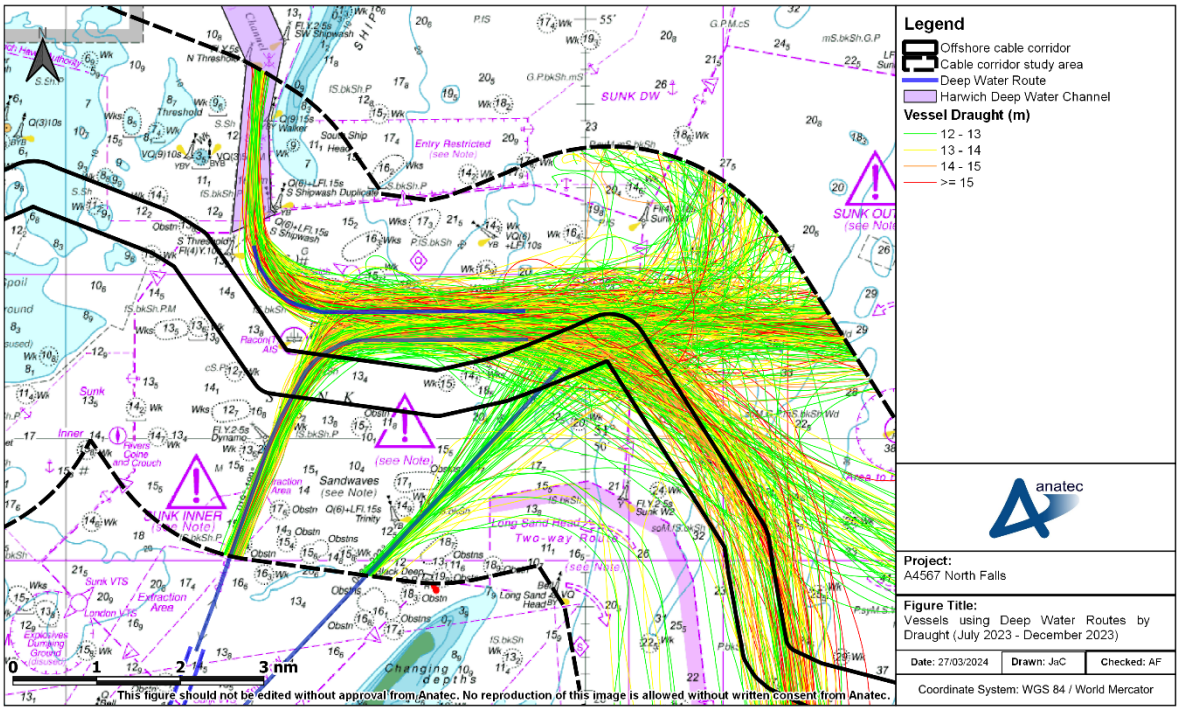

Figure F.22 Vessels Using Deep Water Routes by Draught (July 2023 – December 2023)

1126. Overall, the Sunk Deep Water route was the most commonly used of the three, followed by the Harwich Deep Water route and the Trinity Deep Water route. The traffic using each deep water route is broken down by type and size in Table F.1.

Table F.1 Details of Commercial Vessels (With Draught Above 12m) Using Deep Water Routes

Deep Water Route	Types	Average Number of Unique Vessels per Day	Average Vessel Length	Average Vessel Draught	Maximum Vessel Length	Maximum Vessel Draught
Harwich	Entirely used by cargo vessels.	1	379m	13.8m	400m	16.9m
Sunk	Majority (87%) of traffic was cargo, with the remainder being tanker.	2	317m	13.4m	399m	15.7m
Trinity	Majority (97%) of traffic was cargo, with the remainder being tanker.	One every two to three days	302m	12.7m	399m	14.1m

F.3.4 Vessel Density

1127. Figure F.23 presents the vessel density within the cable corridor study area.

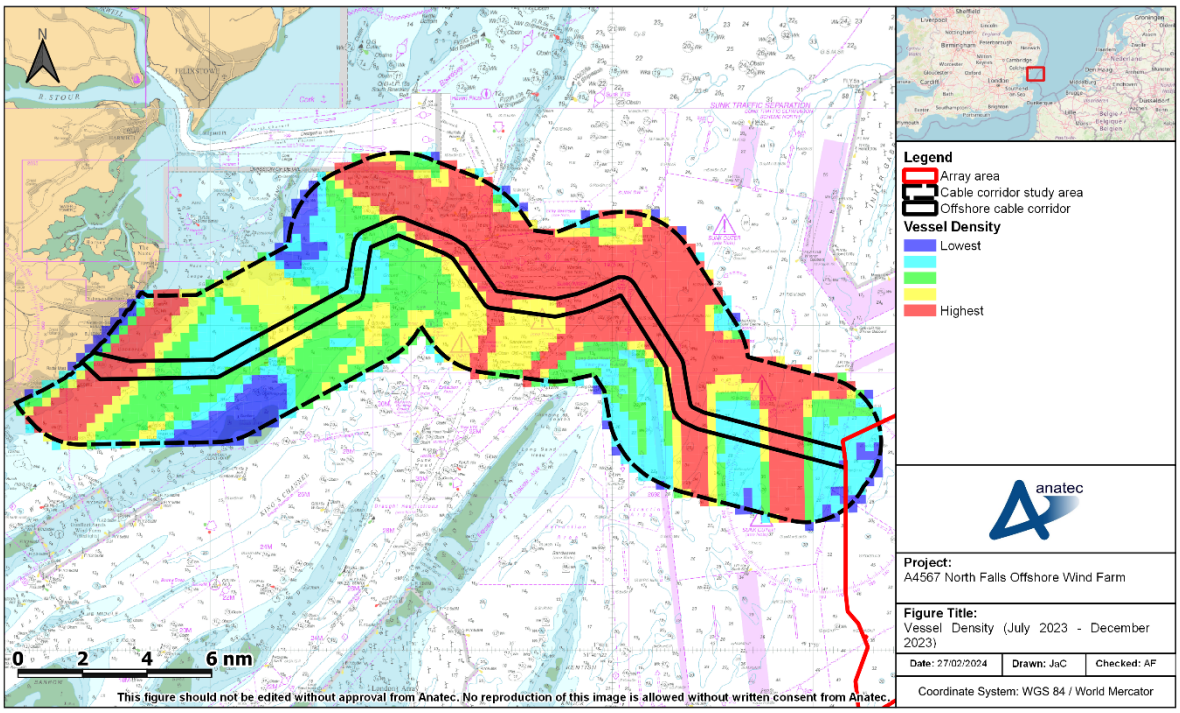

Figure F.23 Vessel Density (July 2023 – December 2023)

1128. There is a region of high density in the centre of the cable corridor study area surrounding the Sunk Pilot Station, corresponding to the heavy amount of traffic that utilises it (i.e. pilot vessels and commercial vessels). High vessel density also results from usage of the traffic lanes of the Sunk TSSs and the deep water routes within the Sunk Inner Precautionary Area. There is also a region of high density close to the coast associated with recreational traffic.

F.3.5 Anchored Vessels

1129. Vessels transmit their navigation status via AIS which includes when a vessel is at anchor. However, this may not always be immediately updated to reflect changes in status. To produce a reliable set of anchored vessels within the cable corridor study area, all AIS tracks from vessels within the AIS data that transmitted their navigation status as ‘At Anchor’ were checked to ensure their speed and behaviour matched that of an anchored vessel. In addition, AIS tracks from vessels which transmitted a navigation status other than ‘At Anchor’ were used as input to Anatec’s Speed Analysis model. The program detects any tracks of vessels that were travelling with speeds less than one knot for a minimum of 30 minutes. This output was then manually checked, and any tracks confirmed as coming from an anchored vessel were added to the tracks from the first step.

1130. Figure F.24 presents the vessels deemed to be at anchor within the cable corridor study area during the six-month period.

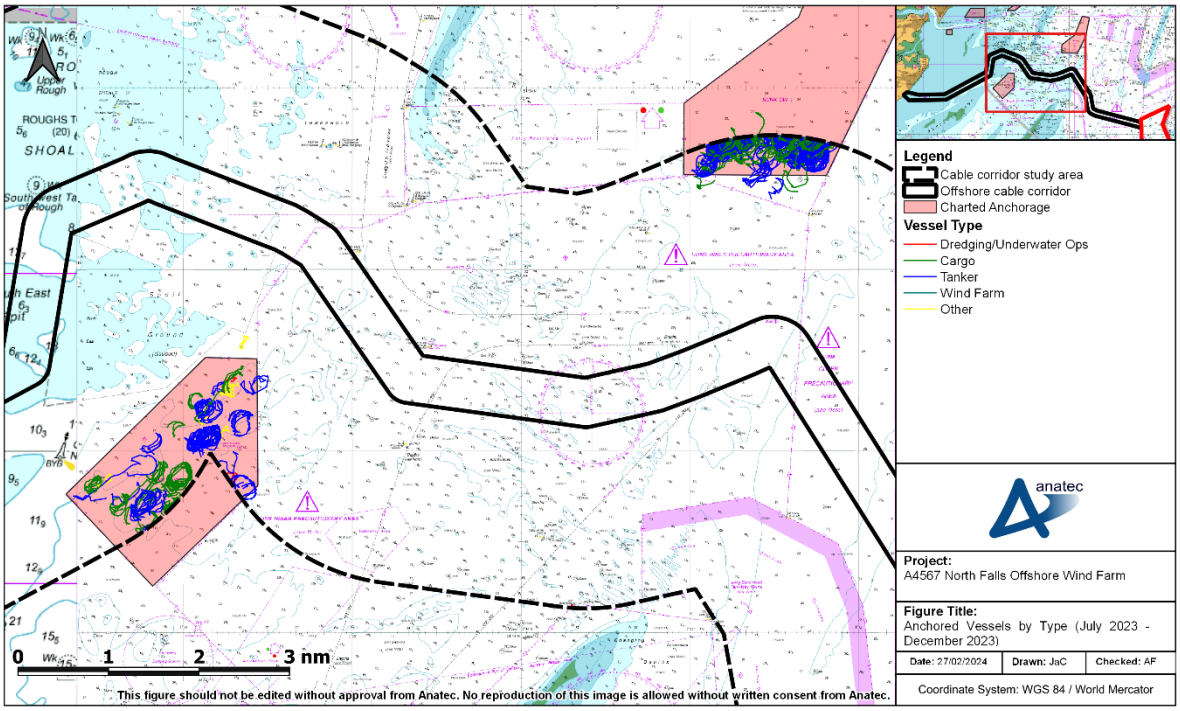

Figure F.24 Anchored Vessels by Type (July 2023 – December 2023)

1131. Anchoring within the cable corridor study area was observed to occur in two areas, namely the Sunk Deep Water Anchorage Area and the Sunk Inner Anchorage Area. The Sunk Deep Water Anchorage Area is located a minimum of approximately 1.6nm north of the offshore cable corridor while the Sunk Inner Anchorage Area is located further west, a minimum of approximately 1.0nm southwest of the offshore cable corridor.

1132. An average of one to two unique vessels per day were deemed to be at anchor within the cable corridor study area during the six-month period. These were mainly tankers, which accounted for approximately 58% of the data, followed by cargo vessels, which accounted for approximately 36%.

F.4 Summary

1133. This report presents analysis of AIS data collected within a 2nm study area around the offshore cable corridor during a six-month period from July 2023 to December 2023.

1134. There was a daily average of 48 to 49 unique vessels recorded within the cable corridor study area during the six-month period. The busiest month was August, with a daily average of 67 vessels. The quietest month was December, with a daily average

of 34 to 35 vessels. This difference was mainly due to higher levels of recreational traffic recorded during the summer.

1135. The most common vessel type was cargo, accounting for 45%. This was followed by recreational vessels (24%), tankers (8%), dredgers (6%), pilot vessels (5%), vessels in the 'other' category (which included lifeboats, multi-purpose vessels and buoy-laying vessels) (3%), passenger vessels (3%), wind farm vessels (2%), tugs (2%) and fishing vessels (2%). Also recorded in low numbers (each accounting for less than 1%) were oil and gas vessels and military vessels.

1136. The average length and draught of vessels within the cable corridor study area during the six-month period was 127m and 7.0m, respectively. The longest vessels were 400m container ships, the majority of which were seen entering/exiting Harwich Deep Water Channel. The deepest draught recorded was 16.9m from a 399m container ship leaving the Harwich Deep Water Channel and entering Sunk TSS South.

1137. High density traffic resulted from usage of Sunk Pilot Station, the Sunk TSSs and the deep water routes within the Sunk Inner Precautionary Area. There was also relatively high density close to shore, corresponding to recreational traffic.

1138. An average of one to two unique vessels per day were deemed to be at anchor within the cable corridor study area during the six-month period. These vessels were recorded using the Sunk Deep Water Anchorage Area and the Sunk Inner Anchorage Area and were mainly tankers and cargo vessels.

Annex G Vessel Traffic Survey 2024

G.1 Introduction

1139. This annex presents analysis of a vessel traffic survey that was undertaken in winter 2024 to supplement the winter and summer 2022 surveys (which are assessed in Section 10).

G.2 Methodology

G.2.1 Study Area

1140. This annex has assessed the vessel traffic data within the same study area for the array area introduced in Section 3.4.

G.2.2 Data Period and Temporary Vessel Traffic

1141. The vessel traffic data assessed in this annex was collected from 17 January 2024 to 1 February 2024; see Section 5.2.2.

1142. In addition to the survey vessel itself, a number of vessel tracks recorded during the data period were classified as temporary (non-routine) and have been excluded from the characterisation of the vessel traffic baseline. These tracks are presented in Figure G.1.

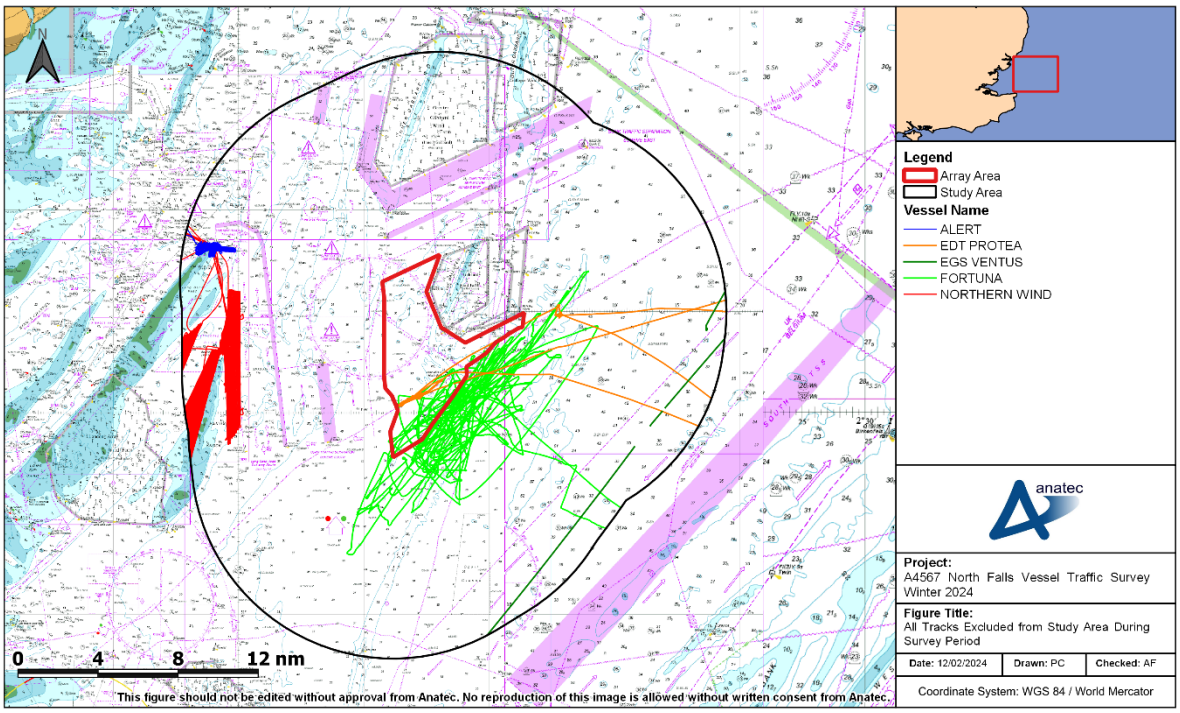

Figure G.1 All Tracks Excluded from Study Area During Survey Period

1143. These vessels removed from the analysis include the survey vessels *Alert* and *Northern Wind* in the west of the study area both displaying and broadcasting surveying behaviour. The *EGS Ventus* was recorded in the east of the study area broadcasting survey as a destination. The *EDT Protea* and the associated vessel *Fortuna* were recorded in proximity to the BritNed cable throughout the survey period and were likely involved in associated maintenance works.

G.2.3 AIS Carriage

1144. General limitations associated with the use of AIS data (for example, carriage requirements) are discussed in full within Section 5.4.1.

1145. The AIS and Radar systems tracked targets 24 hours per day throughout the survey period. The range of Radar depends on the size of target and weather conditions but coverage can be expected to typically be in the range of 12nm-16nm, which provides coverage of any non-AIS vessels passing within or near the array area and study area. A visual lookout was also maintained at all times, subject to the prevailing visibility at the time.

G.3 Analysis

1146. This section presents analysis of vessel tracks recorded within the study area during the survey period via AIS. Note that there were no non-AIS vessels recorded within the study area and based on radar and visual identification all tracks were better represented by AIS.

G.3.1 Vessel Type

1147. The tracks of all vessels are shown in Figure G.2, colour coded by vessel type. No vessels were classed as being of unspecified type, as all vessel types were able to be confirmed.

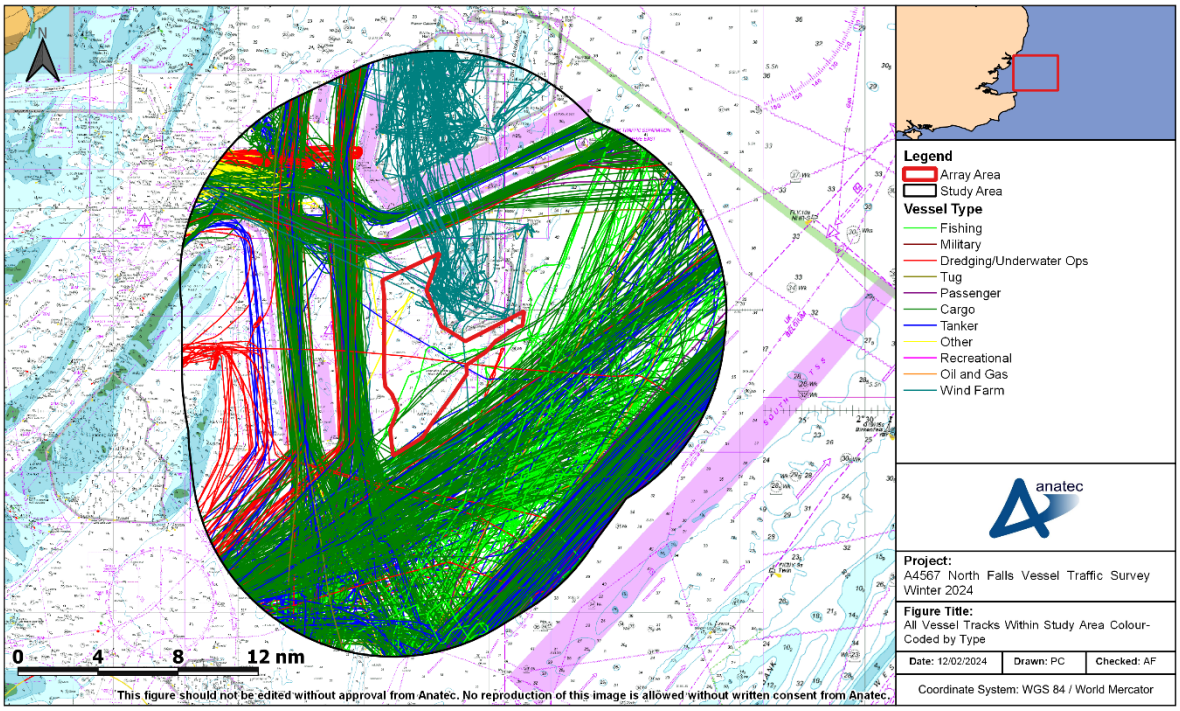

Figure G.2 Vessels by Type (14 Days, Winter 2024)

1148. The majority of vessels were cargo vessels and tankers that can be seen on well-defined routes within the study area utilising pre-defined routeing measures of the Sunk TSS North, Sunk TSS South and Sunk TSS East as well as the TSS North Hinder South within the south east of the study area. These Traffic Separation Schemes are designed to have vessel traffic pass safely going in opposite directions in high traffic areas.

1149. A detailed distribution of vessel types can be seen in Figure G.3, noting that due to low presence, oil & gas support vessels, military vessels and recreational vessels have been grouped into the 'Other' category.

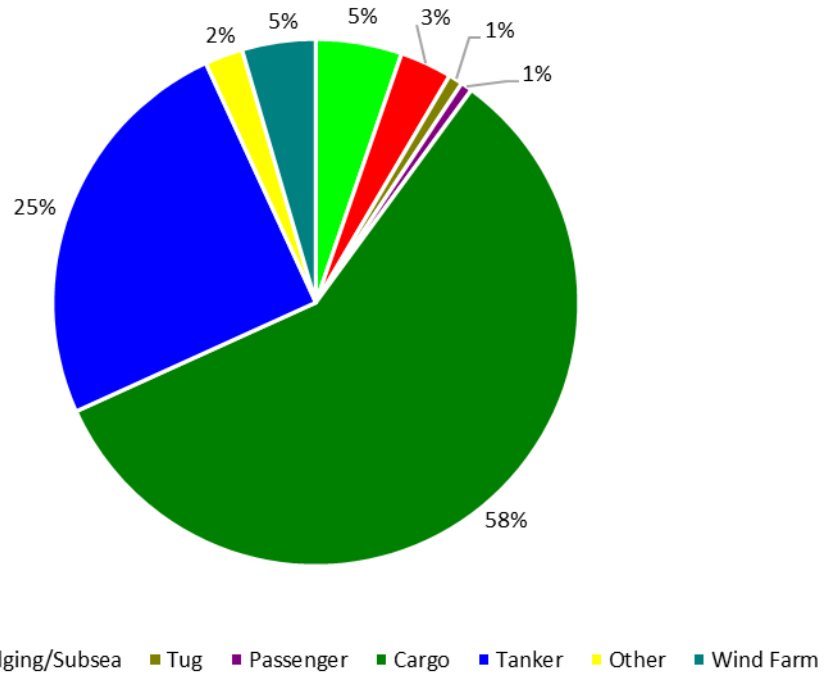

Figure G.3 Distribution of Vessel Types (14 Days, Winter 2024)

1150. The majority of vessels within the study area during the survey period were cargo vessels accounting for approximately 58% of vessel traffic. The next most common vessel type was tankers accounting for approximately 25%. The next two most common vessel types were fishing vessels and wind farm support vessels accounting for approximately 5% of vessel traffic each.

G.3.2 Vessel Counts

1151. Figure G.4 illustrates the number of unique vessels passing through the study area each day during the survey period. Data collection did not extend to 24 hours on some days as the vessel was sheltering or in transit, these days have been marked as partial.

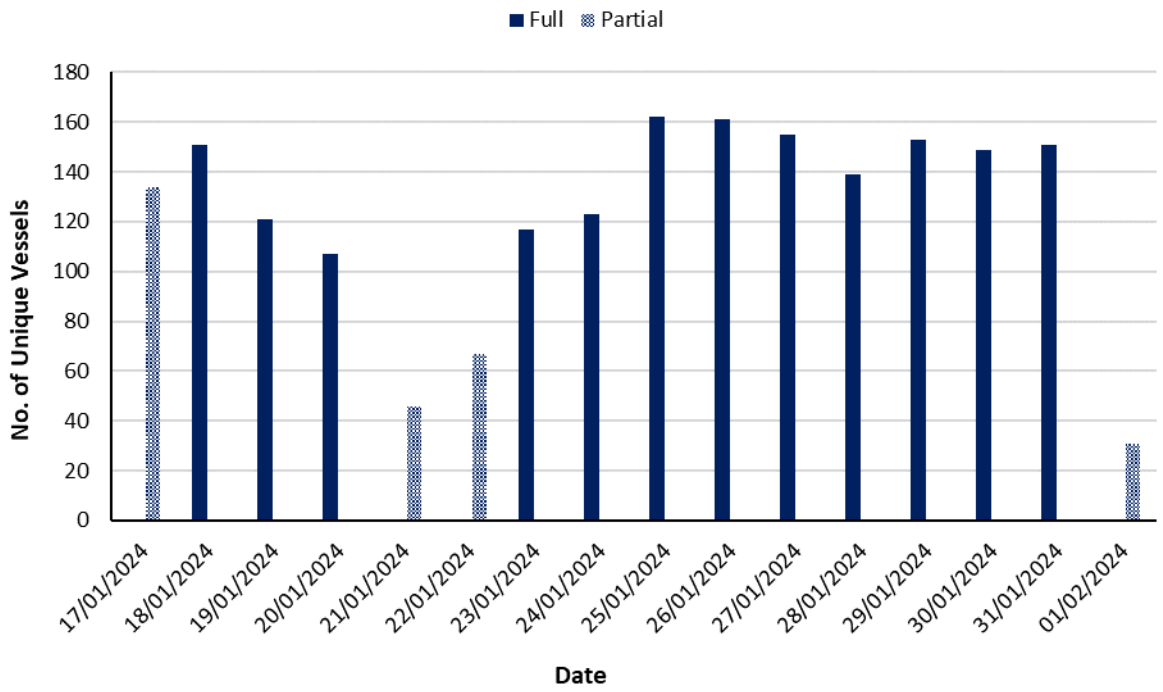

Figure G.4 Unique Vessels Per Day Within Study Area (14 Days, Winter 2024)

1152. There was an average of between 140 and 141 unique vessels per day within the study area during the 14-day survey period. The busiest full day was the 25th of January with a total of 162 unique vessels were recorded. The quietest full day was the 20th of January with 107 unique vessels per day.

G.3.3 Vessel Length

1153. The vessels recorded within the study area during the survey period colour-coded by vessel length are presented in Figure G.5. Less than 1% of all vessels broadcast an invalid length and are present in Figure G.5 but have been removed from Figure G.6 for analysis purposes.

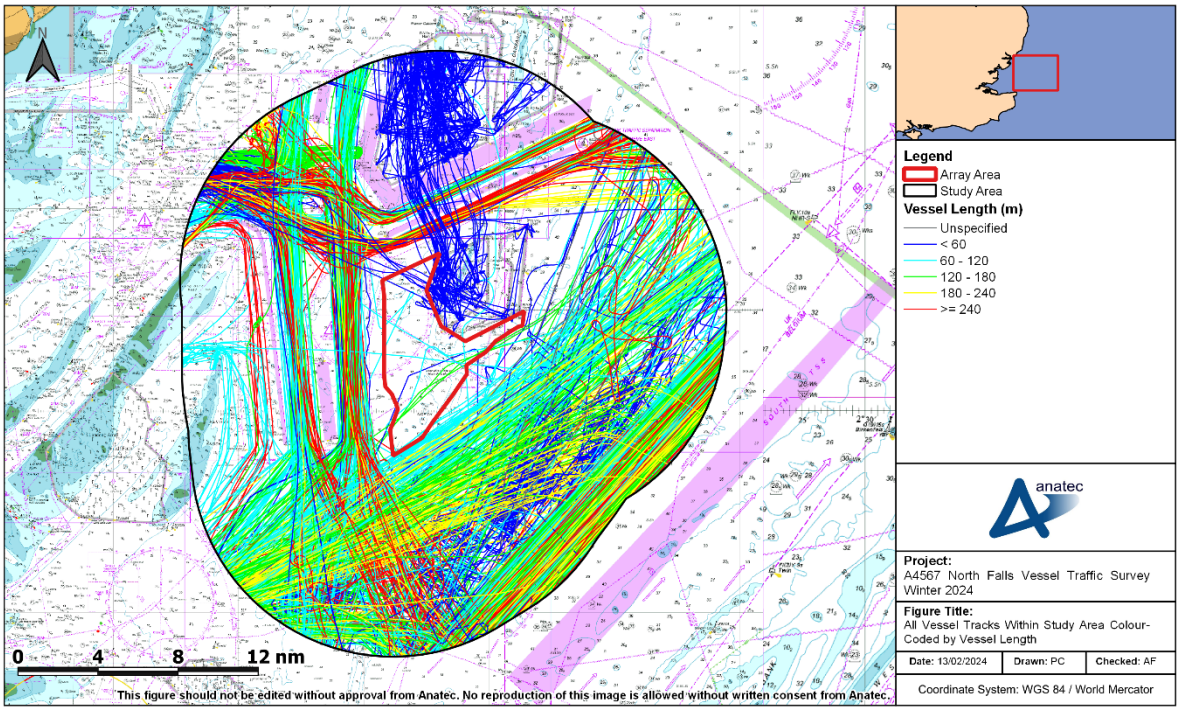

Figure G.5 Vessels by Length (14 Days, Winter 2024)

1154. The majority of the largest vessels recorded within the study area (greater than 240m) were recorded on well-defined routes throughout the Sunk TSS East and Sunk TSS South and on southerly bearings in the TSS North Hinder South.

1155. The smallest vessels recorded within the study area (less than 60m) were typically windfarm support vessels traveling to and from the Greater Gabbard and Galloper OWFs but also pilot vessels at the Sunk pilot boarding location and some fishing vessel activity south of the proposed array area.

1156. Figure G.6 presents the distribution of vessel lengths within the study area during the survey period.

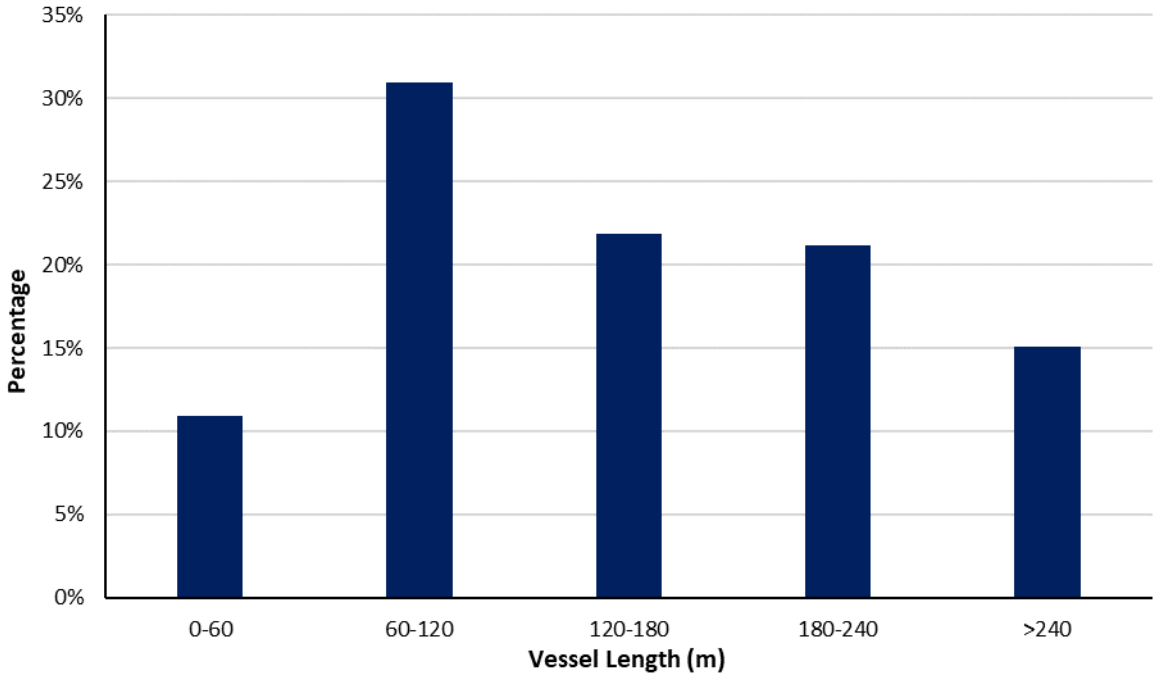

Figure G.6 Distribution of Vessel Lengths (14 Days, Winter 2024)

1157. The average vessel length within the study area during the survey period was approximately 155m. The most common vessel lengths were between 60 and 120m accounting for 31% of all traffic. The next most common vessel lengths were between 120 and 180m accounting for approximately 22% of vessel traffic.

1158. The largest vessel length recorded within the study area was 400m which was broadcast by several container ships, of which, three of these vessels entered the sunk Inner Precautionary Area on four occasions. Vessels greater than 240m accounted for approximately 15% of all traffic.

G.3.4 Vessel Draught

1159. The vessels recorded within the study area during the survey period colour-coded by vessel draught are presented in Figure G.7. A total of 4% of all vessels broadcast an invalid length and are present in Figure G.7 but have been removed from Figure G.8 for analysis purposes.

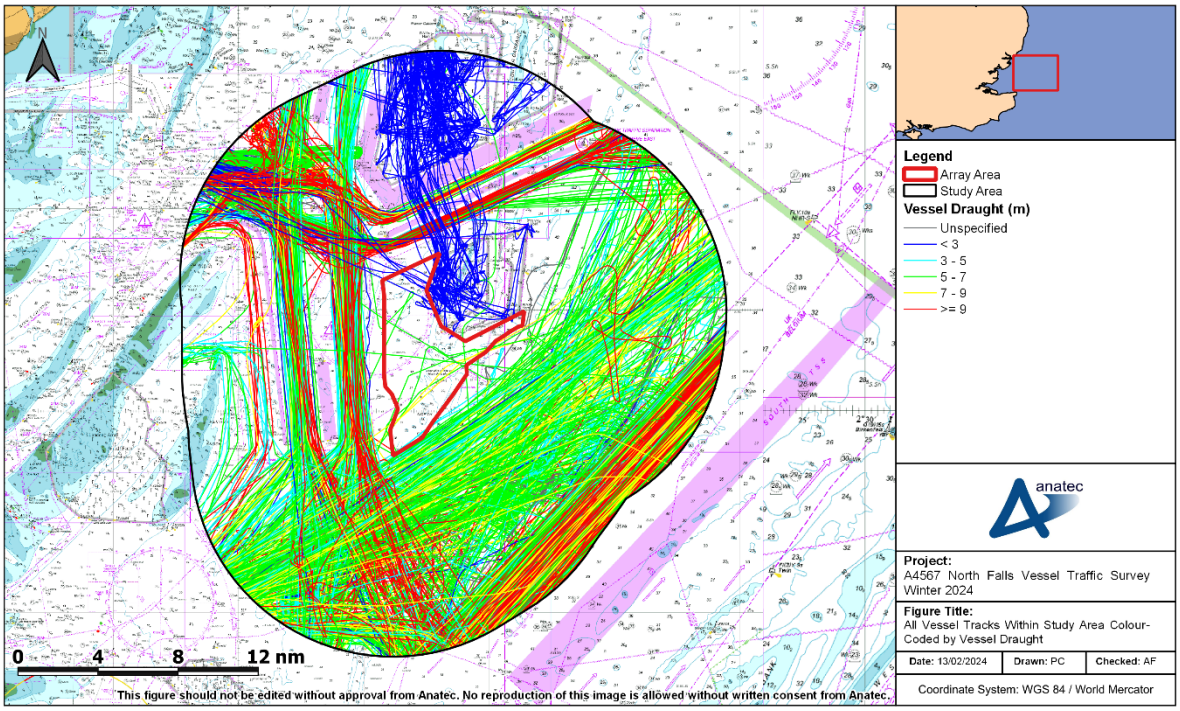

Figure G.7 Vessels by Draught (14 Days, Winter 2024)

1160. The majority of greatest broadcast draughts recorded within the study area (greater than 9m) were recorded on well-defined routes throughout the Sunk TSS East and Sunk TSS South and on southerly bearings in the TSS North Hinder South.

1161. The smallest broadcast vessel draughts recorded within the study area (less than 3m) were typically windfarm support vessels traveling to and from the Greater Gabbard and Galloper OWF's and pilot vessels at the Sunk pilot boarding area.

1162. A distribution of vessel draughts within the study area during the survey period can be seen in Figure G.8.

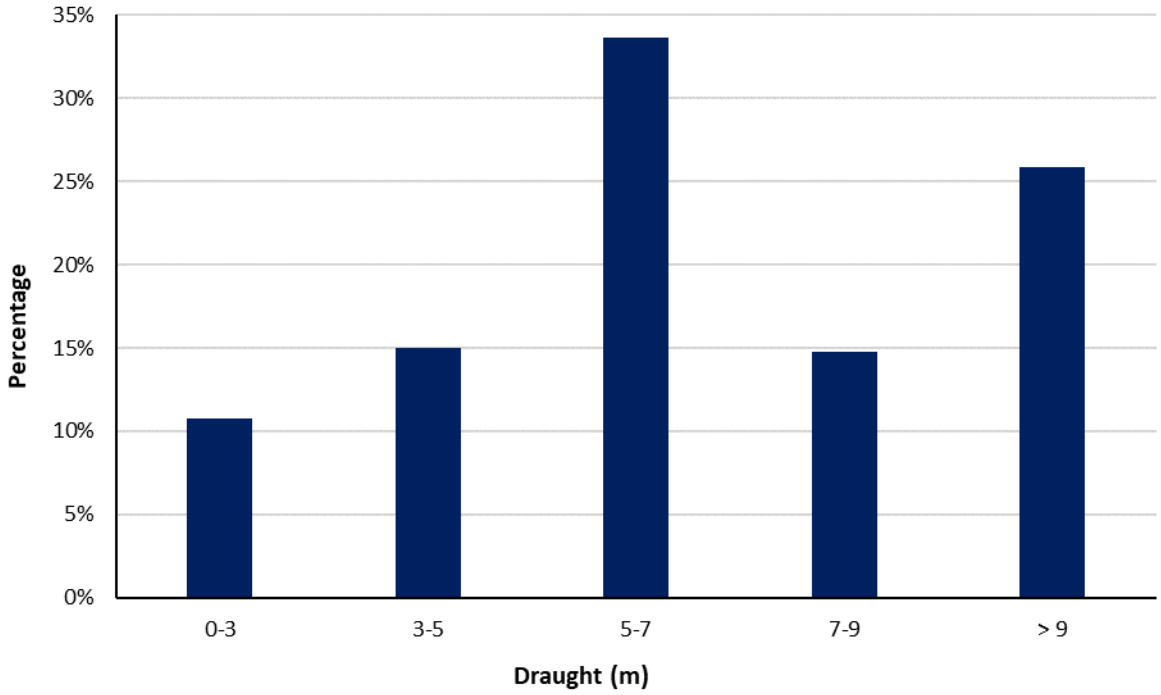

Figure G.8 Distribution of Vessel Draughts (14 Days, Winter 2024)

1163. The average vessel draught within the study area during the survey period was approximately 7m. The most common vessel draughts were between 5 and 7m accounting for approximately 34% of all vessel traffic. The next most common vessel draughts were greater than 9m accounting for 26% of all vessel traffic. The deepest recorded draught was 17.1m from a crude oil tanker travelling on a south bearing in the TSS North Hinder South. The deepest recorded draught entering the Sunk Inner Precautionary Area was a containership with a reported draught of 15.9m.

G.3.5 Vessel Speed

1164. The vessels recorded within the study area during the survey period colour-coded by average speed are presented in Figure G.9. There were no invalid speeds broadcast on AIS.

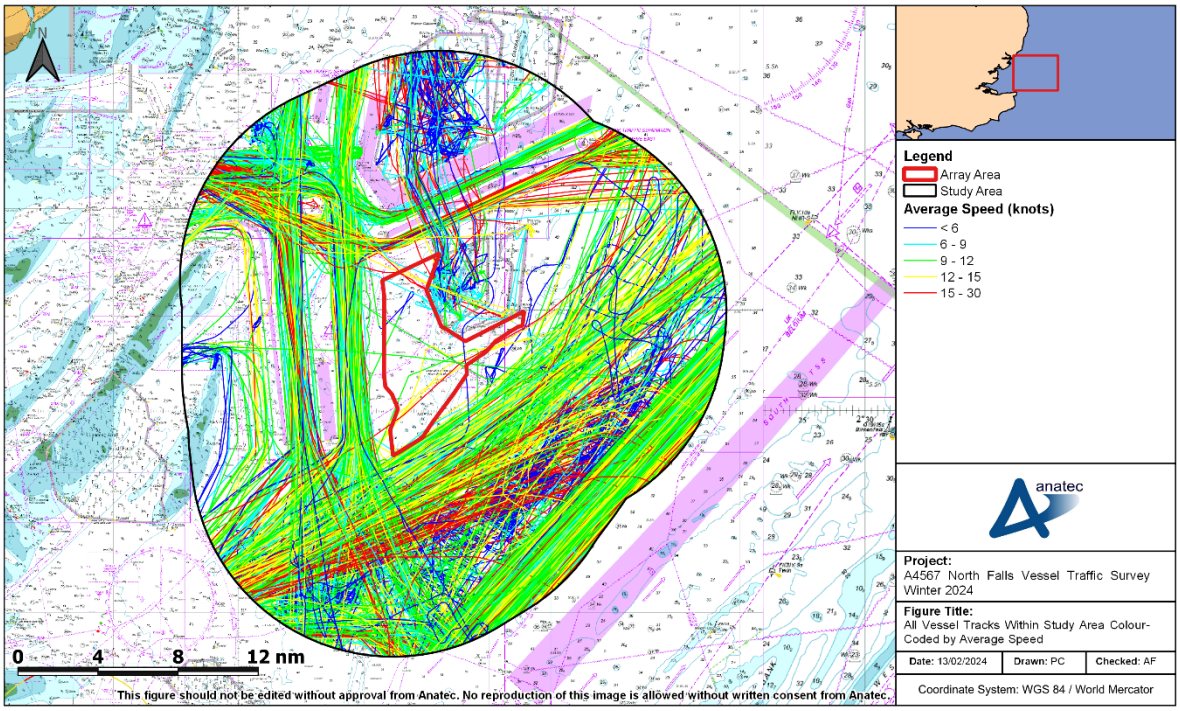

Figure G.9 Vessels by Average Speed (14 Days, Winter 2024)

1165. The majority of vessels with the fastest average speeds (greater than 15 knots) were recorded in the Sunk TSS East/Sunk Inner and within or near the vicinity of the TSS North Hinder South with some presence on the Greater Gabbard and Galloper OWFs.

1166. The vessels with the slowest average speeds (less than 6 knots) were recorded within the Greater Gabbard and Galloper OWFs and just north of the TSS North Hinder South.

1167. The distribution of average speeds within the study area during the survey period are presented in Figure G.10.

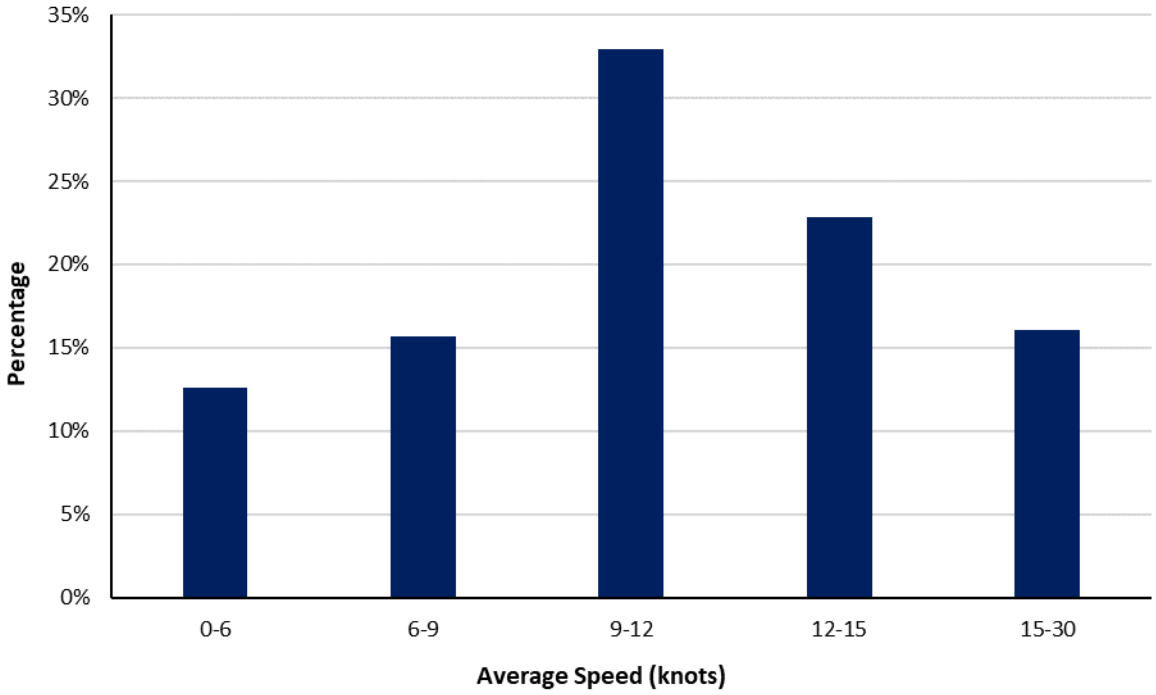

Figure G.10 Distribution of Average Speeds (14 Days, Winter 2024)

1168. The average speed within the study area during the survey period was approximately 11 knots. The most common average speeds were between 9 and 12 knots accounting for approximately 33% off all traffic. The next most common average speeds were between 12 and 15 knots accounting for approximately 23% of vessel traffic. Average speeds greater than 15 knots accounted for approximately 16% of all vessel traffic.

G.3.6 Destinations

1169. The distribution of most common valid destinations within the study area can be seen in Figure G.11.

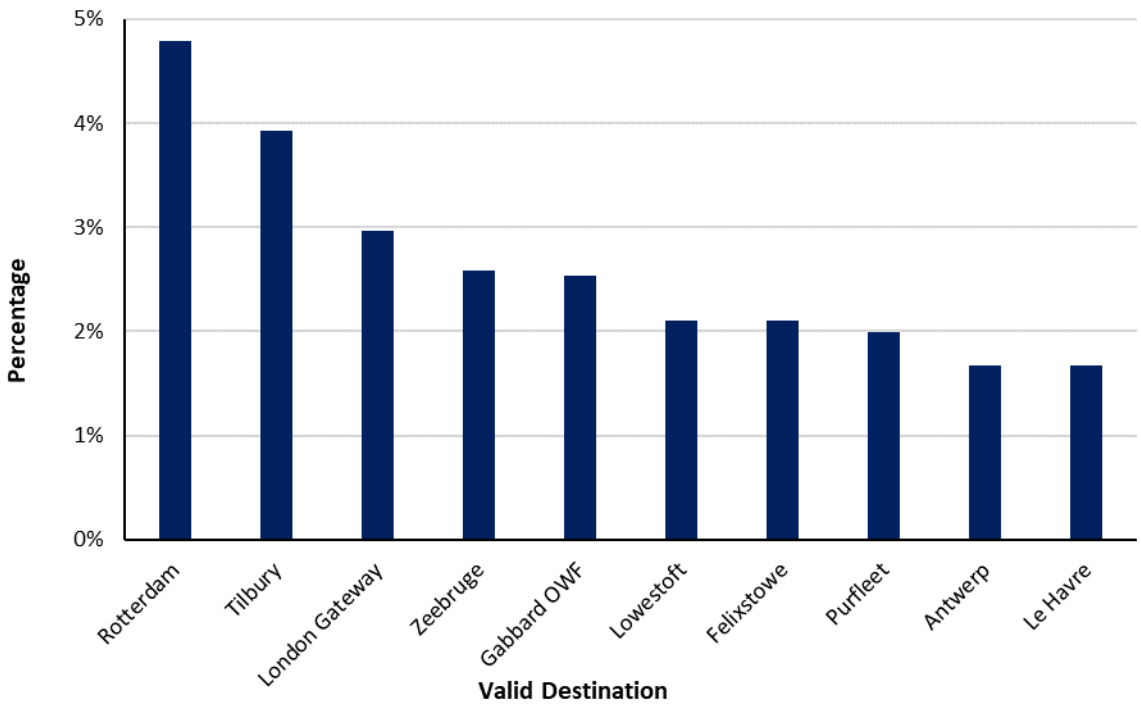

Figure G.11 Distribution of Valid Destinations (14 Days, Winter 2024)

1170. The most common destination was Rotterdam (Netherlands) accounting for approximately 5% of all valid broadcast destinations. The next most common destination was Tilbury accounting for approximately 4% of valid destinations. London Gateway Port, Zeebrugge (Belgium) and the Gabbard OWF accounted for approximately 3% of valid destinations. Lowestoft, Felixstowe, Purfleet, Antwerp (Belgium) and Le Havre (France) accounted for approximately 2% of valid destinations.

G.3.7 Anchored Vessels

1171. Vessels broadcasting an 'at anchor' status via AIS were identified and confirmed by manually verifying that the vessels were engaged in behaviour reflective of being at anchor. Vessels broadcasting other navigational statuses were assessed against a set behavioural criteria (speeds of less than one knot for at least 30 minutes) to identify any potential additional cases of anchoring, noting the outputs were again manually verified.

1172. There was a total of 18 anchoring vessels withing the study area during the survey period identified on this basis, all of which were cargo vessels and tankers. These were primarily in the northwest of the study area utilising the Sunk Deep-Water anchorage, with four recorded in the south west and one instance southeasterly of the array area.

1173. A more detailed view of the tracks in the northwest of the study area can be seen in Figure G.12.

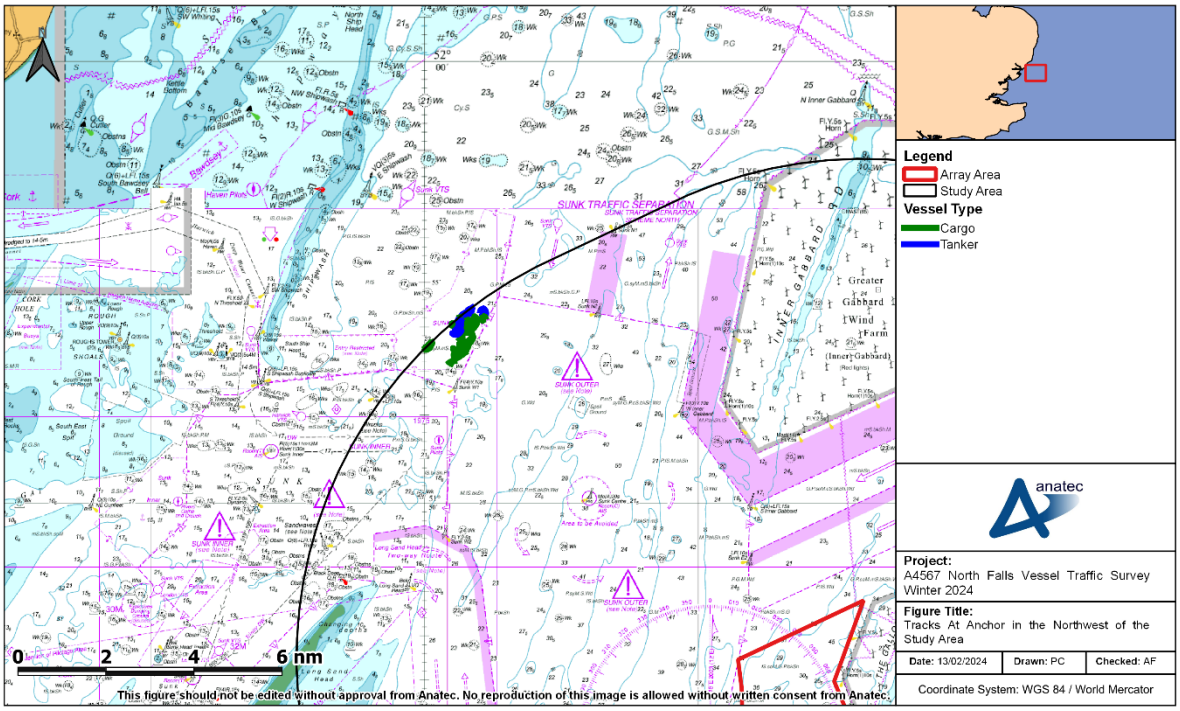

Figure G.12 Tracks At Anchor in the Northwest of the Study Area

1174. A more detailed view of the tracks at anchor in the south of the study area can be seen in Figure G.13.

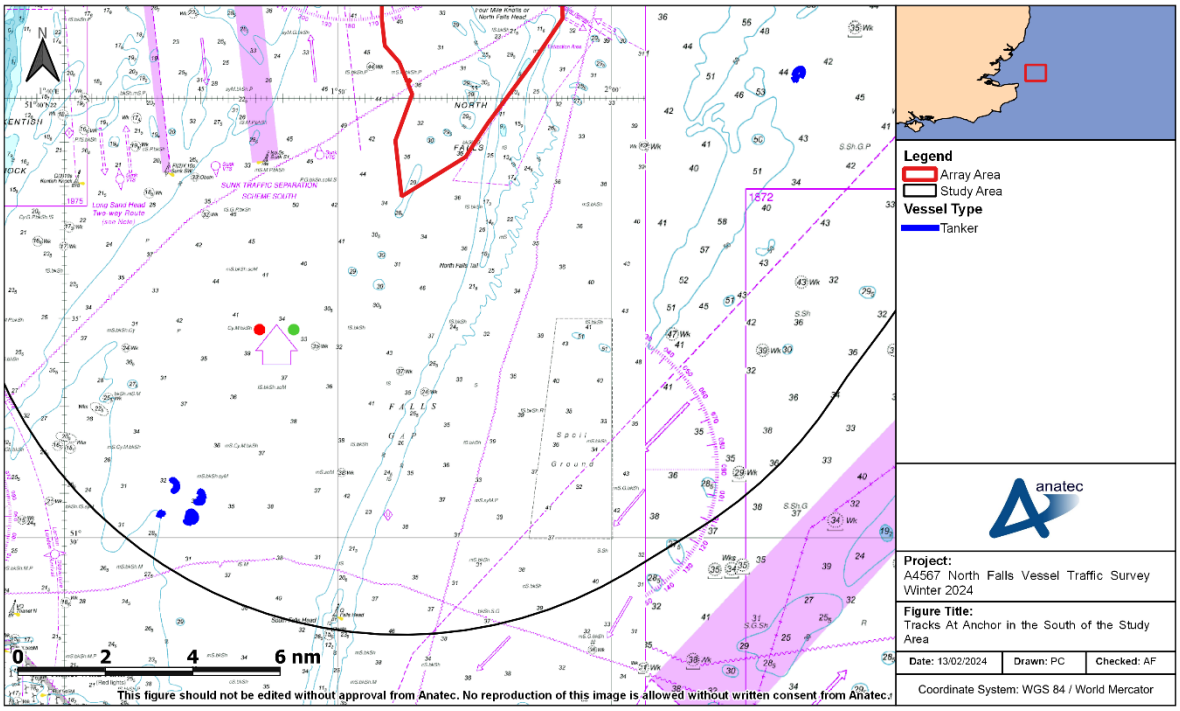

Figure G.13 Tracks At Anchor in the South of the Study Area

1175. All vessels displaying anchoring behaviour in the south of the study area were tankers. Three tankers were observed in the southwest of the study area (one of which anchored on two separate occasions), displaying anchoring behaviour. Another tanker was recorded approximately 5nm southeasterly from the array area, approximately 2.5nm northwest of the TSS North Hinder South.

G.3.8 Vessels Intersecting Array Area

1176. Figure G.14 presents tracks of vessels which intersected the array area during the survey period.

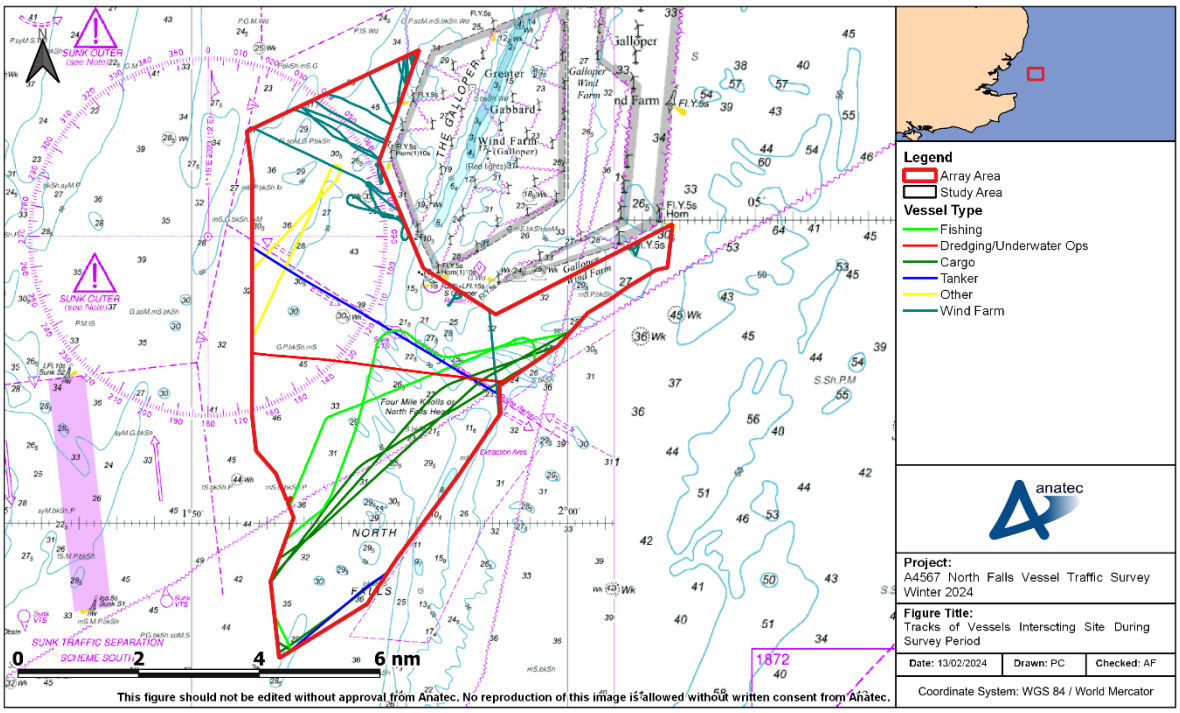

Figure G.14 Tracks of Vessels Intersecting the Array Area (14 Days, Winter 2024)

1177. A total of 29 unique vessels intersected the array area during the survey period corresponding to an average of approximately two unique vessels per day.

1178. The majority of these were windfarm support vessels accounting for 17 of all intersecting vessels (59%). These wind farm support vessels typically intersected the north of the array area transiting to and from the Greater Gabbard and Galloper OWFs.

1179. The second most common vessel type to intersect the array area were cargo vessels. Three of these intersected the centre of the array area on a southwest bearing with a destination of Sheerness, the smallest of which had a length of 134m and a broadcast draught of 5.3m. The fastest of these vessels had an average speed of approximately 16.6 knots. A further three cargo vessels intersected the southern

extremity of the array area with London Gateway port, Herøya (Norway) and Frederiksværk (Denmark) as their destinations.

1180. Two tankers were recorded intersecting the array area. One utilised the Recommended Ferry Route while on passage to Teesport, the other intersected the southern extremity of the array area on passage to Rotterdam (Netherlands).

1181. Two fishing vessels intersected the array area, with both likely to have been in transit rather than actively fishing (i.e., gear deployed) based on average speed and track behaviour.

1182. One marine aggregate dredger also intersected the centre of the array area.

1183. A detailed distribution of vessel types that intersected the array area during the survey period can be seen in Figure G.15.

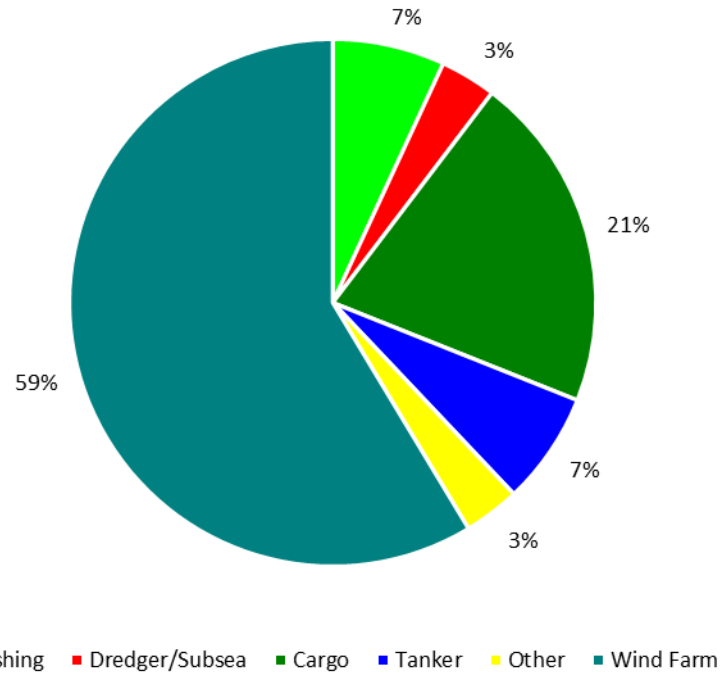

Figure G.15 Distribution of Vessel Types Intersecting the Array Area (14 Days, Winter 2024)

1184. The most common vessel type intersecting the array area during the survey period were windfarm support vessels (59%) followed by cargo vessels (21%).

G.3.9 Detailed Review by Vessel Type

1185. This section presents an in-depth analysis of the most common vessel types recorded within the study area during the survey period.

G.3.9.1 Cargo Vessels

1186. Figure G.16 shows the tracks of cargo vessels within the study area during the survey period.

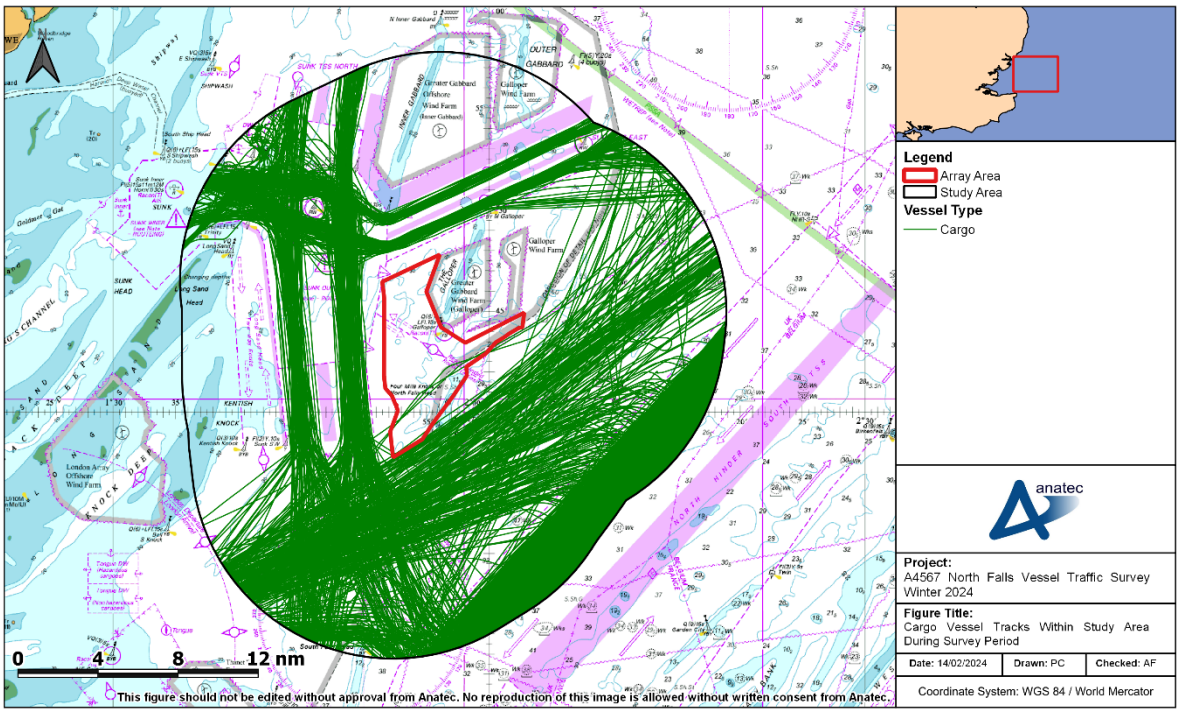

Figure G.16 Cargo Vessels (14 Days, Winter 2024)

1187. An average of approximately 82 unique cargo vessels per day were recorded within the study area during the survey period. A high volume of cargo vessels were recorded in the TSS North Hinder South. Notable volumes were also recorded using the Sunk TSS East, Sunk TSS South, Sunk TSS North and the Sunk Inner Precautionary Area. A number of cargo vessels were also present passing just south of the array area on an east/west bearing.

G.3.9.2 Tankers

1188. Figure G.17 shows the tracks of tankers within the study area during the survey period.

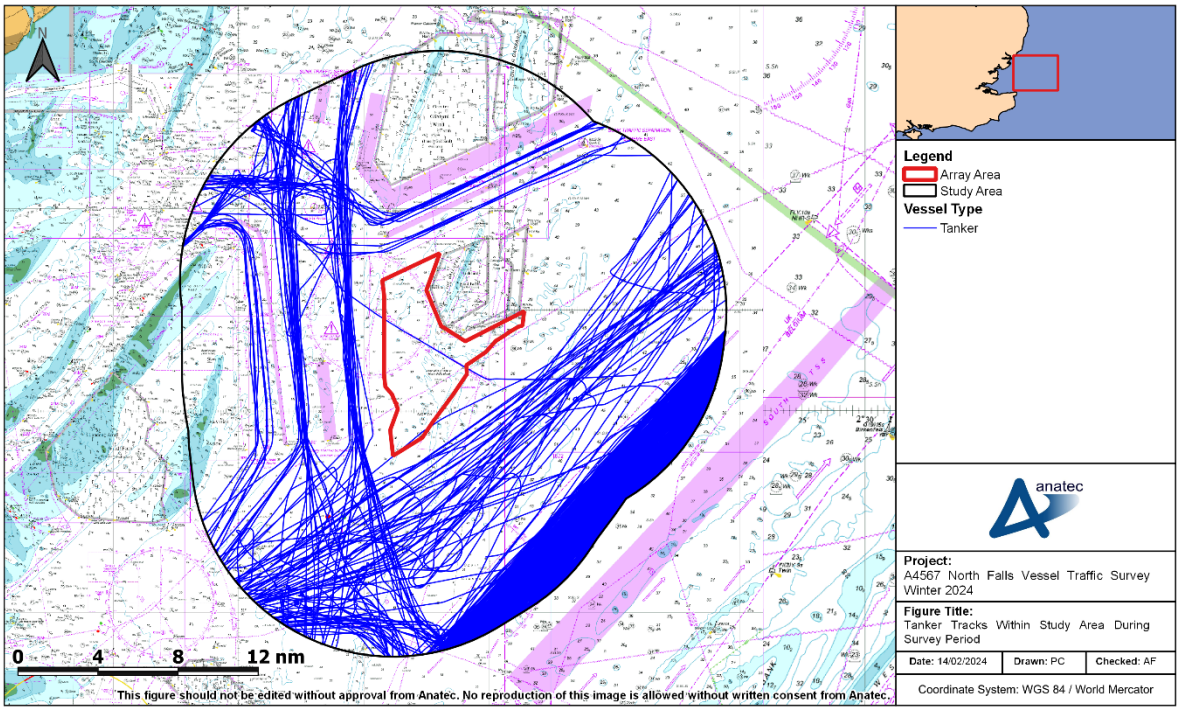

Figure G.17 Tankers (14 Days, Winter 2024)

1189. There was an average of 35 unique tankers per day recorded within the study area during the survey period. The majority of tankers were present within the TSS North Hinder South. A number of tankers were recorded utilising the Sunk TSS South, Sunk TSS North and Sunk TSS East. With several tankers also passing the south of the array area.

G.3.9.3 Fishing Vessels

1190. Figure G.18 shows the tracks of fishing vessels within the study area during the survey period. No fishing vessels were recorded on Radar during the survey period.

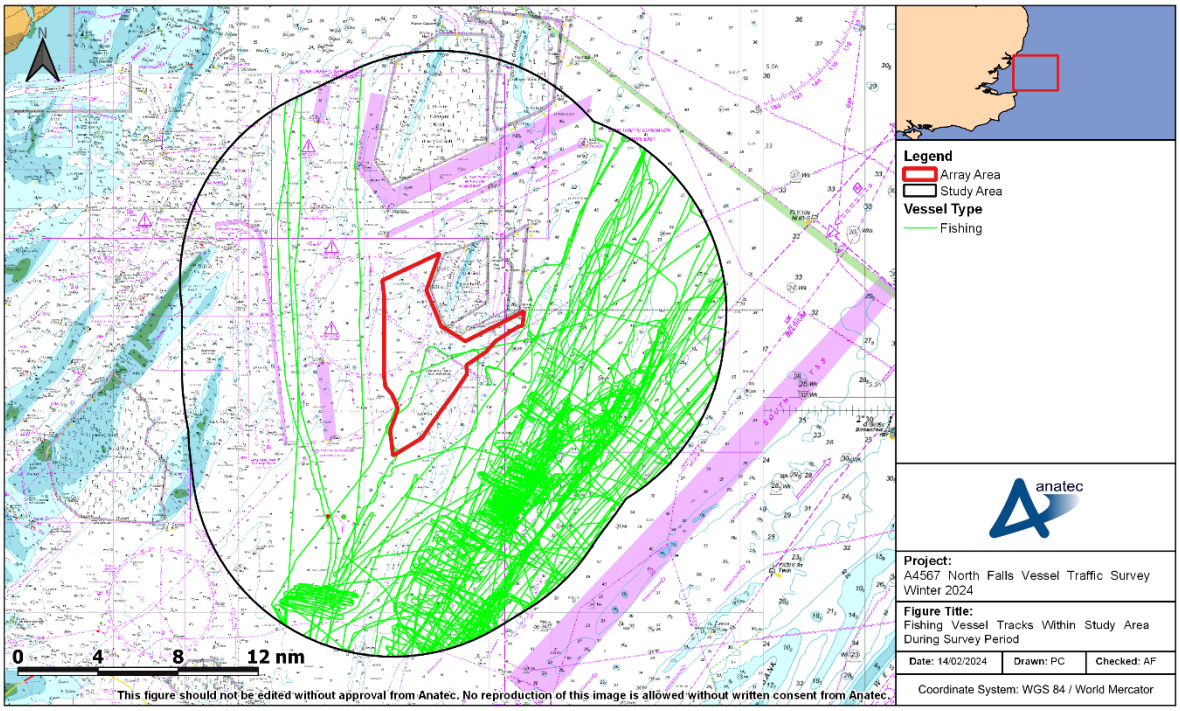

Figure G.18 Fishing Vessels (14 Days, Winter 2024)

1191. Approximately, an average of between seven and eight unique fishing vessels per day were recorded within the study area during the survey period. The majority of fishing vessels were seen southeast of the array area.

1192. Based on track behaviour, average speed, fishing gear and information broadcast on AIS it was determined that there was fishing activity within the south and east of the study area. The vessels engaged in active fishing were trawlers, with most activity occurring between the southeast of the array area and the TSS North Hinder South with some occurrences happening within the TSS North Hinder South.

G.3.9.4 Wind Farm Support Vessels

1193. Figure G.19 shows the tracks of wind farm support vessels within the study area during the survey period.

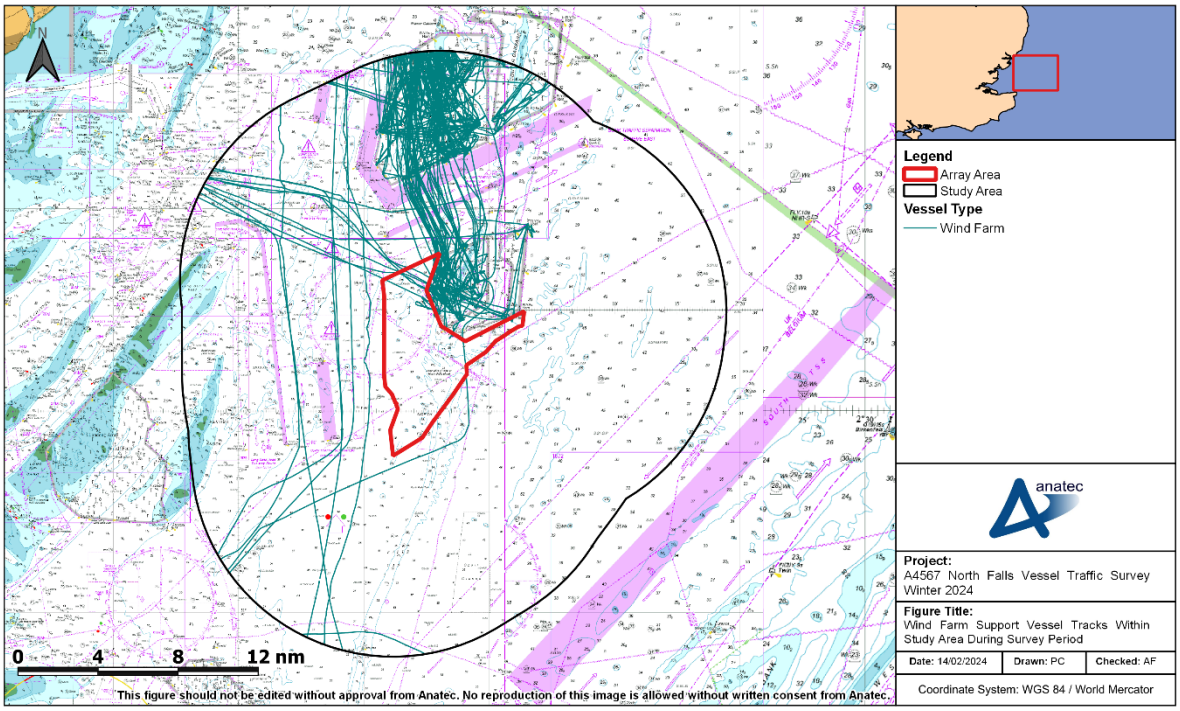

Figure G.19 Wind Farm Support Vessels (14 Days, Winter 2024)

1194. An average of approximately between six and seven unique wind farm support vessels per day were recorded within the study area during the survey period. The majority of these vessels were seen north of the array area, transiting to and from Lowestoft to the north and the Greater Gabbard and Galloper OWFs. Some of these vessels were also seen in transit to and from Harwich to the west.

G.3.9.5 Marine Aggregate Dredging

1195. Figure G.20 shows the tracks of marine aggregate dredging vessels within the study area during the survey period.

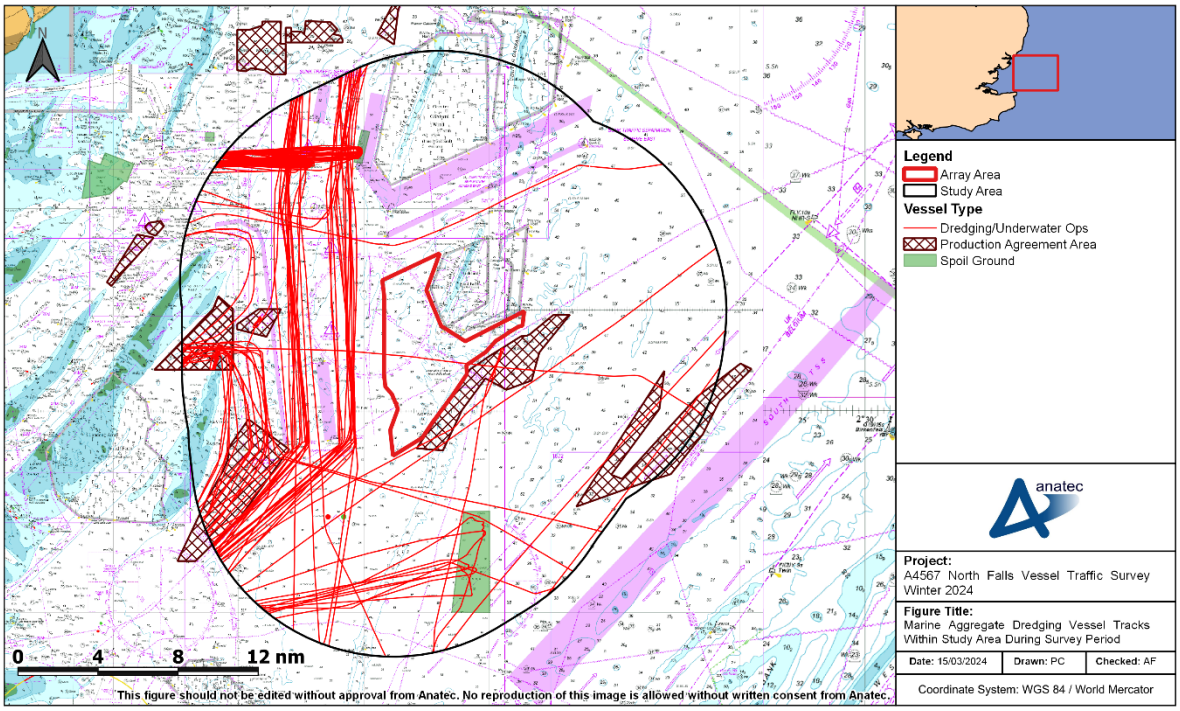

Figure G.20 Marine Aggregate Dredgers (14 Days, Winter 2024)

1196. There was an average of approximately between four and five marine aggregate dredging vessels per day within the study area during the survey period. A number of these vessels were recording utilising the Sunk TSS North and Sunk TSS South, while only one was recorded in the Sunk TSS East with a destination of Rotterdam. Several vessels were likely engaged in marine aggregate dredging based on average speed, track behaviour and information broadcast on AIS. Active dredging was observed in known charted extraction areas belonging to CEMEX UK Marine Ltd in the west of the study area north of the Kentish Knock. Another dredging vessel was likely working at extraction area 524 operated by DEME Building Materials Ltd immediately south east of the array area.

G.3.9.6 Passenger Vessels

1197. Figure G.21 presents the tracks of passenger vessels within the study area during the survey period.

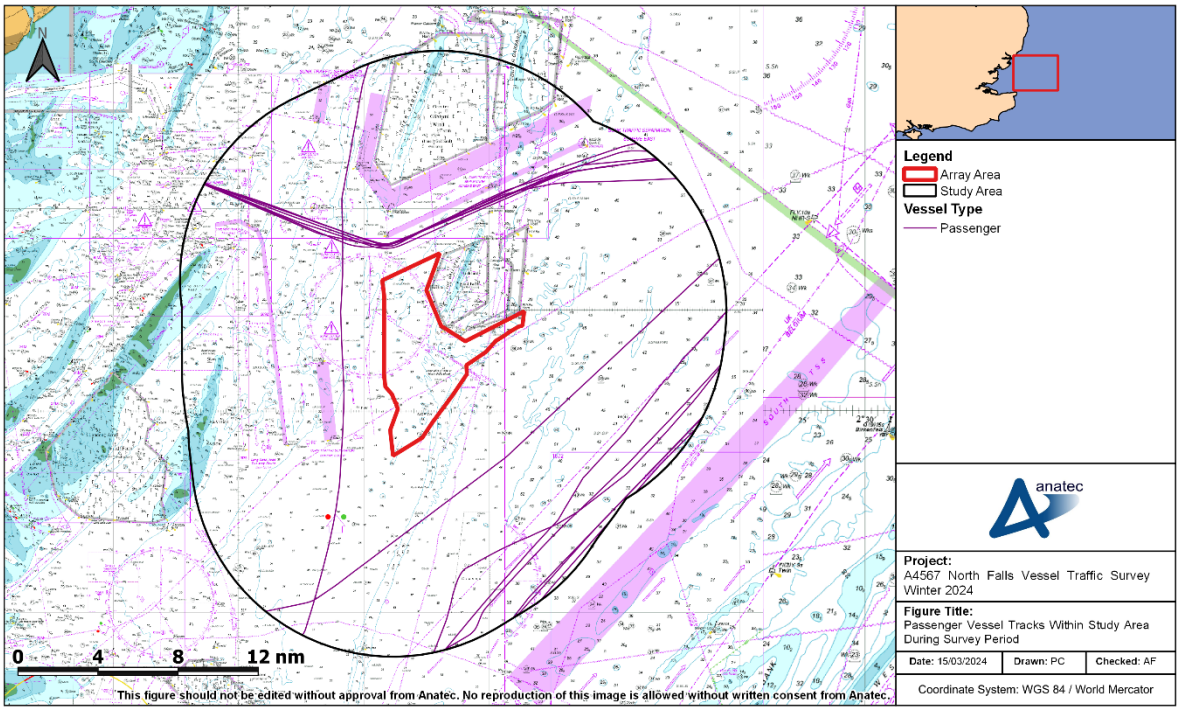

Figure G.21 Passenger Vessels (14 Days, Winter 2024)

1198. There was an average of one unique passenger vessels per day within the study area during the survey period. Six were observed heading eastbound in the Sunk TSS East with a destination of Hoek Van Holland (Netherlands) operated by Stena Line. A further six were observed on southbound bearings utilising the TSS North Hinder South.

G.3.9.7 Pilot Vessels

1199. Figure G.22 presents the tracks of pilot vessels within the study area during the survey period.

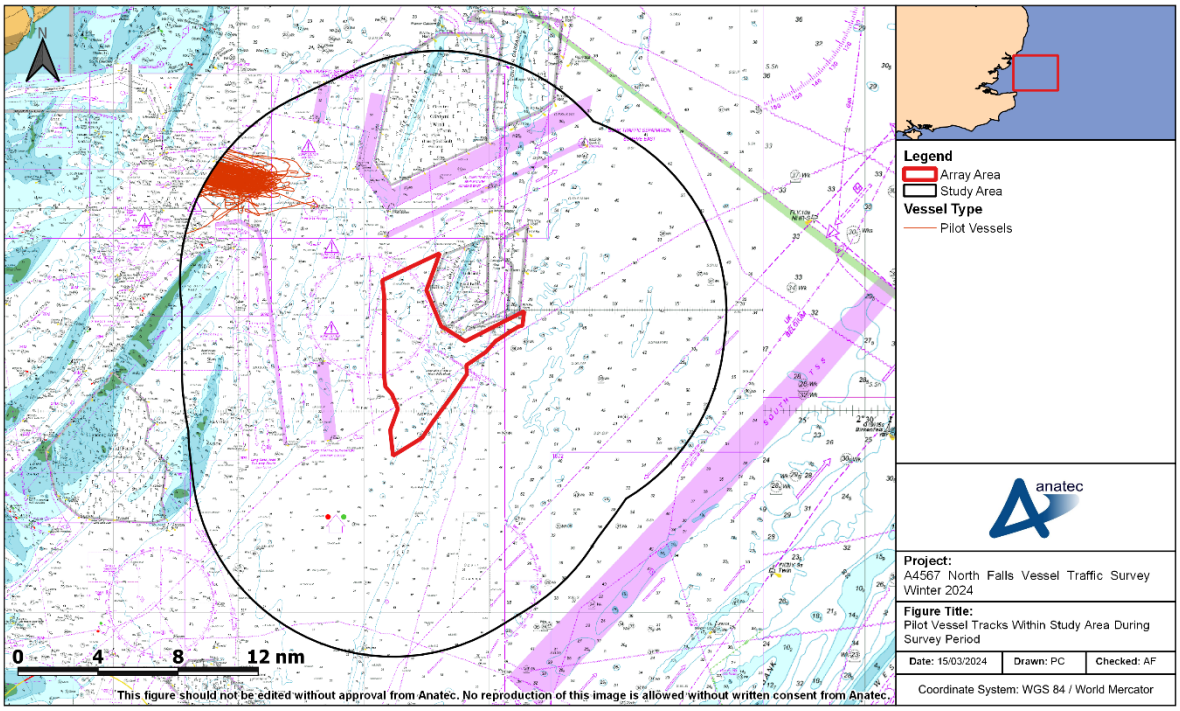

Figure G.22 Pilot Vessels (14 Days, Winter 2024)

1200. There was an average of between two and three pilot vessels per day within the study area during the survey period. All pilot vessels were operating within the Sunk pilot boarding location in the northwest of the study area.

G.3.9.8 Recreational Vessels

1201. One recreational vessel was recorded within the study area during the study period on a northeast bearing on passage between the south east of the array area and the TSS North Hinder South. No recreational vessels were recorded on Radar.

G.4 Summary

1202. In this annex AIS data collected by the dedicated survey vessel *GV Star of Hope* is presented within a 10nm study area around the proposed North Falls OWF array area southeast of the East Suffolk coast. No radar data was recorded that was not better represented by AIS. The survey period was a 14-day period between the 17th of January to the 1st of February 2024, noting that the survey vessel left the array area between the 21st and 22nd of January due to adverse weather conditions.

1203. Several tracks considered to be non-routine were excluded from the analysis, including survey and guard vessels.

1204. On average, 141 unique vessels per day were recorded within the study area during the 14-day survey period, all of which were recorded on AIS. The most common vessel types recorded during the survey period were cargo vessels and tankers (58%

and 25%, respectively). Other common vessel types were fishing vessels and wind farm support vessels.

1205. The average length and draught of vessels within the study area was 155m and 7m, respectively. The longest vessels recorded were several container ships measuring 400m in length. The deepest draught was 17.1m which was broadcast by a crude oil tanker.

1206. The average speed of vessels within the study area was 11 knots. Average speeds greater than 15 knots accounted for approximately 16% of all vessel traffic.

1207. The most frequently broadcast destinations for vessels within the study area were Rotterdam and Tilbury.

1208. A total of 29 vessels were recorded intersecting the array area during the survey period, corresponding to an average of two unique vessels every day. The most common vessel type were wind farm support vessels followed by cargo vessels.

1209. A total of 18 vessels were recorded at anchor during the study period mostly within the Sunk Deep-Water Anchorage area, with none observed within the proposed array area.

Annex H Additional Main Commercial Routes

1210. As per Section 11.2, 43 main commercial routes were identified within the study area from the long-term AIS vessel traffic data. These routes were split into three categories; high use, medium use, and low use, bases on route traffic volume.

1211. The high use routes were detailed in Section 11.2 and this Annex provides the same information for the medium and low use main commercial routes.

1212. The medium use main commercial vessel routes (one to two transits per day) and the low use routes (more than one transit every two days [more than four per week]) are similarly presented in Figure H.1 and Figure H.2, respectively, and described in Table H.1 and Table H.2, respectively. The average vessels per day has been rounded to the nearest whole number for each route.

1213. As aforementioned, routes with less than one transit every two days (less than four per week) are not characterised as routes and have not been included in the following figures. However, they are accounted for in the collision and allision risk modelling (see Section 15).

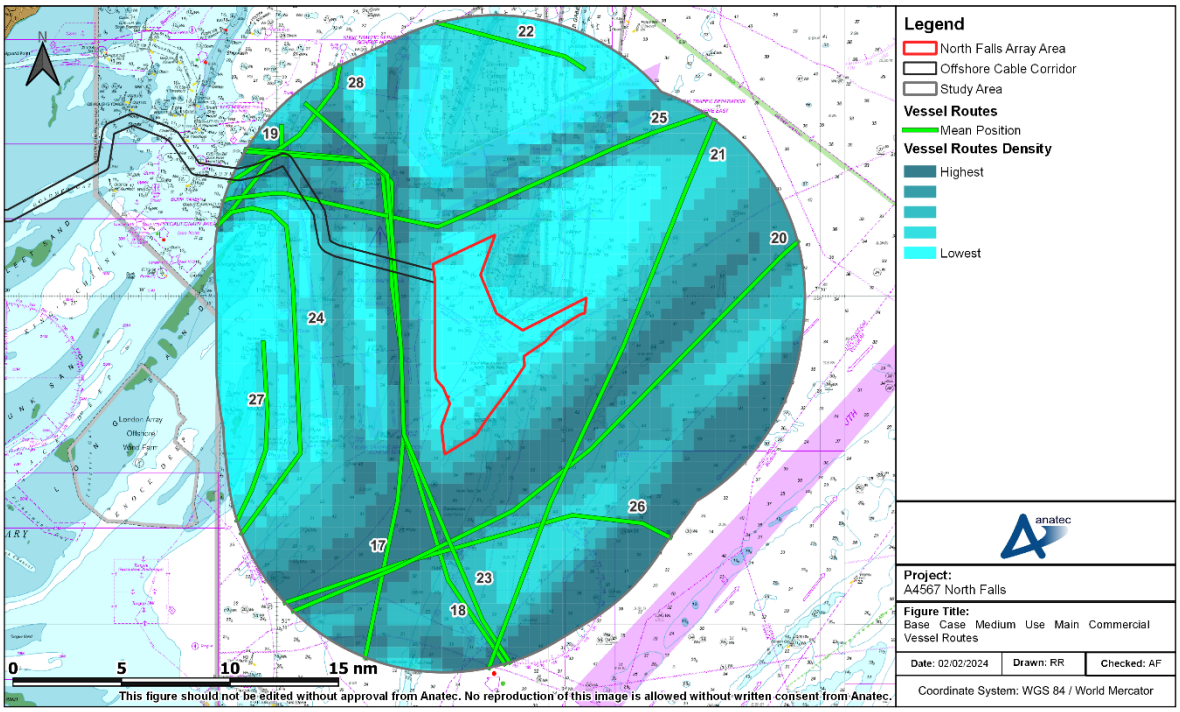

Figure H.1 Base Case Medium Use Main Commercial Vessel Routes

Table H.1 Description of Medium Use Main Commercial Routes

Route Number	Average Vessels per Day	Average Vessels per Week	Description
17	2	14	**Dover Strait – Felixstowe (UK) via Sunk TSS South Northbound Lane.** Generally used by cargo vessels (91%).
18	2	14	**West Hinder TSS – Ipswich/Felixstowe (UK) via Sunk TSS South Northbound Lane.** Generally used by cargo vessels (89%).
19	2	14	**Sunk Precautionary Area – London Gateway (UK).** Generally used by cargo vessels (65%) and tankers (28%).
20	2	13	**River Thames Ports (UK) – Rotterdam (The Netherlands).** Generally used by cargo vessels (53%) and tankers (44%).
21	1-2	10	**West Hinder TSS – East North Sea Ports.** Generally used by cargo vessels (62%) and tankers (22%).
22	1-2	10	**Galloper Offshore Wind Farm (UK) - Harwich (UK).** Only used by wind farm vessels (100%).
23	1-2	9	**West Hinder TSS –Felixstowe (UK) via Sunk TSS South Northbound Lane.** Generally used by cargo vessels (84%).
24	1-2	8	**Charlton (UK) – Long Sand Dredge Area.** Generally used by marine aggregate dredgers (58%) and tankers (18%)
25	1-2	8	**Harwich/Felixstowe (UK) – Hamburg (Germany)/Rotterdam (The Netherlands) via Sunk TSS East Eastbound Lane.** Generally used by cargo vessels (81%).
26	1-2	8	**Harwich (UK) – Rotterdam (The Netherlands).** Generally used by cargo vessels (88%).
27	1	7	**Charlton (UK) – Long Sand Dredge Area.** Generally used by marine aggregate dredgers (94%).
28	1	7	**Sunk TSS North – Medway Ports.** Generally used by cargo vessels (78%).

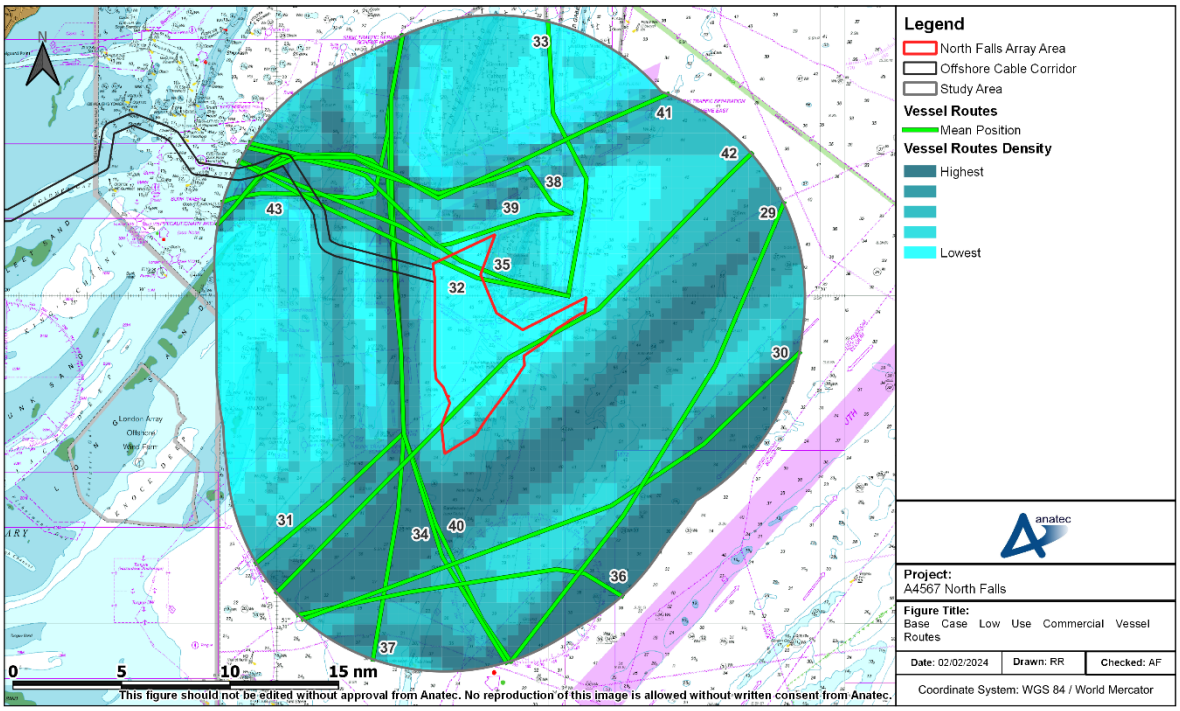

Figure H.2 Base Case Low Use Commercial Vessel Routes

Table H.2 Description of Low Use Commercial Routes

Route Number	Average Vessels per Day	Average Vessels per Week	Description
29	0-1	6	**East North Sea Ports – Dover Strait.** Generally used by cargo vessels (55%) and tankers (36%).
30	0-1	5	**West Hinder TSS – River Thames Ports.** Generally used by cargo vessels (58%) and tankers (37%).
31	0-1	5	**River Thames Ports – North Sea Dredge Areas.** Generally used by marine aggregate dredgers (49%) and cargo vessels (37%).
32	0-1	5	**Harwich (UK) – Galloper Offshore Wind Farm (UK).** Only used by wind farm vessels (100%).
33	0-1	5	**Harwich (UK) – Galloper Offshore Wind Farm (UK).** Only used by wind farm vessels (100%).
34	0-1	5	**West Hinder TSS East – Humber Ports, inc. Boston (UK) via Sunk TSS South Northbound Lane.** Generally used by cargo vessels (77%) and tankers (16%).
35	0-1	5	**Galloper Offshore Wind Farm (UK) - Harwich (UK).** Only used by wind farm vessels (100%).
36	0-1	5	**Tilbury/Purfleet (UK) – Zeebrugge (Belgium)/Rotterdam (The Netherlands).** Generally used by cargo vessels (75%) and tankers (11%).

Route Number	Average Vessels per Day	Average Vessels per Week	Description
37	0-1	4	**Dover Strait – London Gateway (UK) via Sunk TSS South Northbound Lane.** Generally used by cargo vessels (94%).
38	0-1	4	**Galloper Offshore Wind Farm (UK) - Harwich (UK).** Only used by wind farm vessels (100%).
39	0-1	4	**Harwich (UK) - Galloper Offshore Wind Farm (UK)** Only used by wind farm vessels (100%).
40	0-1	4	**Antwerp (Belgium) – London Gateway (UK) via Sunk TSS South Northbound Lane.** Generally used by cargo vessels (91%).
41	0-1	4	**Hamburg (Germany) – London Gateway (UK) via Sunk TSS East Westbound Lane.** Generally used by cargo vessels (75%) and tankers (18%).
42	0-1	4	**Norwegian Ports – Sheerness (UK).** Generally used by cargo vessels (93%).
43	0-1	4	**River Thames Ports – Varberg (Sweden) via Sunk TSS North Northbound Lane.** Generally used by cargo vessels (81%).

Annex I Regular Operator Letter

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Date: 05/07/2023
Ref: A4567-NF-RO-1

Opportunity to Participate in Consultation Relating to Shipping and Navigation for the Proposed North Falls Offshore Wind Farm

Dear Stakeholder,

North Falls Offshore Wind Farm Limited is the developer of North Falls Offshore Wind Farm (hereafter 'the project'), a planned offshore wind farm located at the approach to the Thames Estuary. Following issue of the Scoping Report in 2021, the project is now producing a Navigational Risk Assessment (NRA) in support of the shipping and navigation work being undertaken as part of the overarching application.

As part of this NRA process, the project would like to ensure that comprehensive consultation is undertaken and to identify any potential impacts that the project may have upon shipping and navigation. Therefore, shipping movements within and in the vicinity of the site boundary of the project have been analysed via assessment of 12 months of Automatic Identification System (AIS) data for the purpose of identifying any regular vessel operators in the area.

According to this analysis, your company's vessel(s) have been recorded navigating within and/or in the vicinity of the project. Consequently, your company has been identified as a potential marine stakeholder we should engage with. We therefore invite your feedback on the potential development, including any impact it may have upon the navigation of vessels.

Figure 1 presents the proposed array areas, within which the wind turbine generators and associated structures such as offshore substation platforms will be located.

Further information relating to the project is also available here. The Preliminary Environmental Information Report (PEIR) for the project is also currently out for consultation, and is available for viewing here. Chapter 15 Shipping and Navigation will be of interest. The project is planning site boundary refinement to address input received to date and also to be received as part of the PEIR process, and as such note that the site boundary shown in Figure 1 will be changing post PEIR.

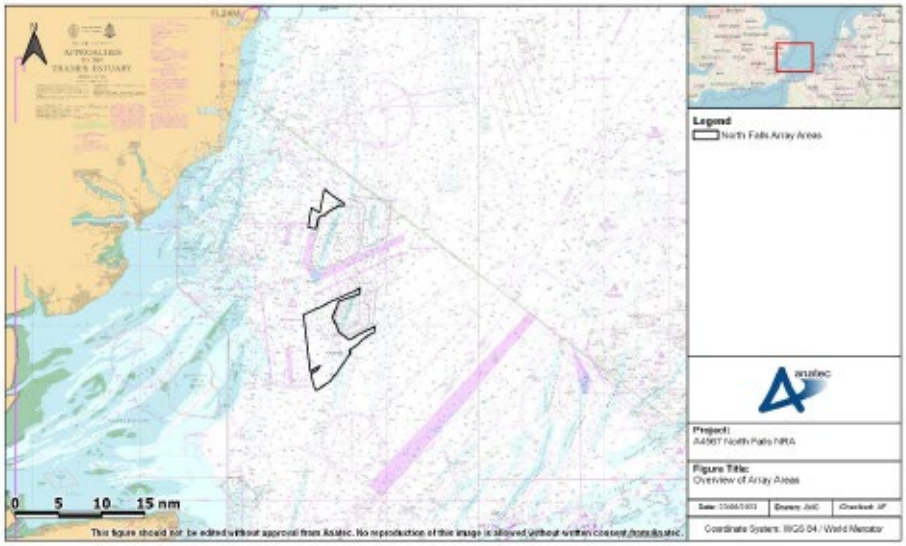

Figure 1 Overview of Array Areas

For reference the current site boundaries are shown relative to key local navigational features (which include the Sunk routeing measures) in Figure 2[1].

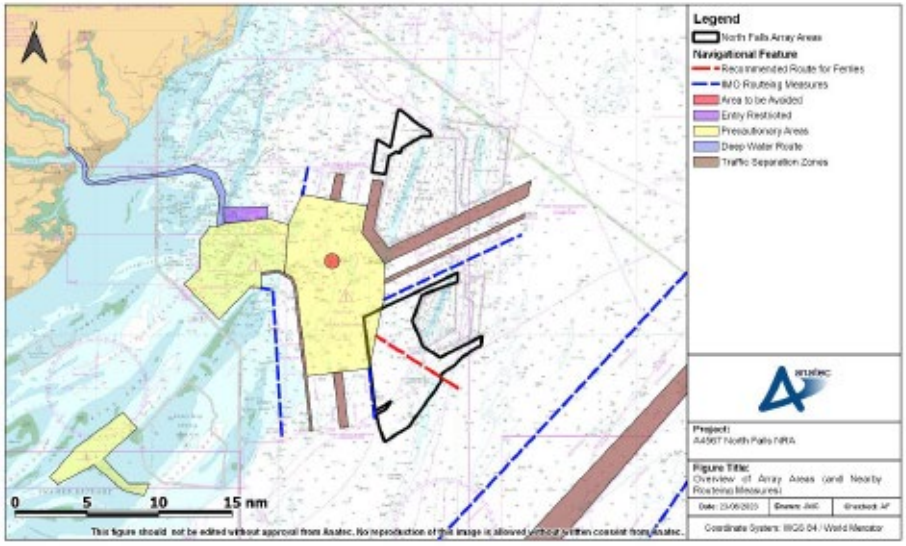

Figure 2 Overview of Nearby Routeing Measures

We would be grateful if you could provide us with any comments or feedback that you may have, including any impact it may have upon the navigation of vessels, by Friday 21st July. This

[1] Note it is planned that the recommended ferry route (shown as a red dashed line in Figure 2) will be removed as part of the development process.

will allow us to assess your feedback as part of the NRA which is currently being undertaken. We would also be grateful if you could forward a copy of this information to any other vessel operators/owners you feel may be interested in commenting.

Whilst we welcome all feedback we are particularly interested in any comments or feedback on the following:

1. Whether the proposal to construct the project is likely to impact the routeing of any specific vessels, including the nature of any change in regular passage.
2. Whether any aspect of the project poses any safety concerns to your vessels, including any adverse weather routeing.
3. Whether you would choose to make passage internally through the array areas.
4. Whether you wish to be retained on our list of marine stakeholders and consulted throughout the NRA process.

Additionally, we would like to invite you to attend a Hazard Workshop for the project scheduled to take place in August 2023. We will be confirming details of the workshop imminently.

We would appreciate if any responses are provided via email to [redacted] as well as an indication of whether you are interested in participating in the Hazard Workshop noted above.

Yours sincerely,

[redacted]
Risk Analyst
Anatec Ltd

NORTH FALLS

Offshore Wind Farm

sse Renewables | RWE

HARNESSING THE POWER OF NORTH SEA WIND

North Falls Offshore Wind Farm Limited

A joint venture company owned equally by SSE Renewables and RWE.

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