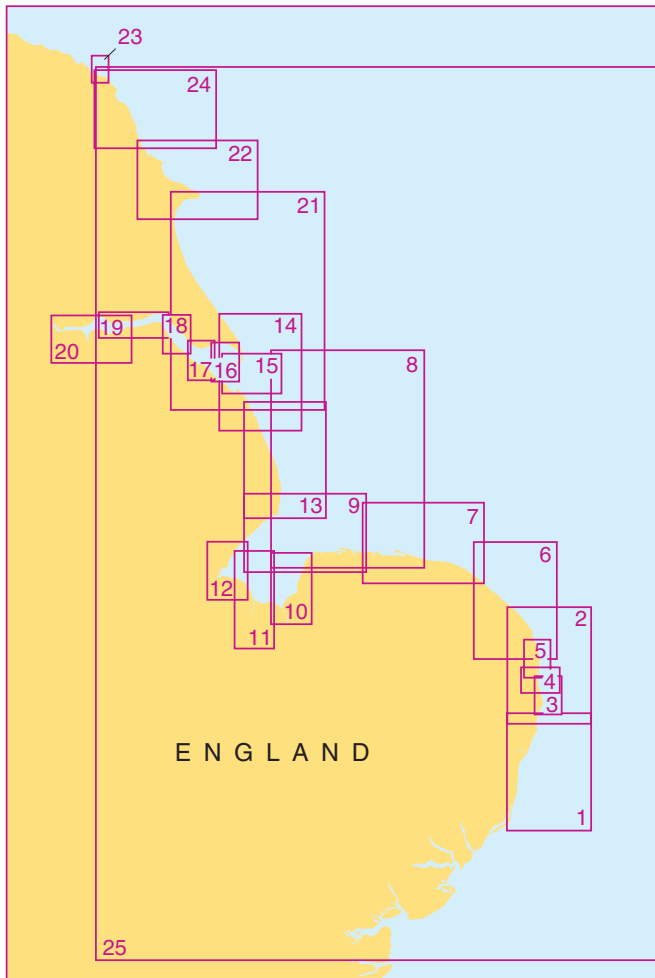




# East Coast - Orford Ness to Whitby

## Coverage Diagram



|     |   |
|-----|---|
| 7A  | Cromer to Wells-next-the-Sea              |
| 7B  | Wells-next-the-Sea                        |
| 8   | Outer Approaches to The Wash              |
| 9   | Approaches to The Wash                    |
| 10A | The Wash - Eastern Part                   |
| 10B | Continuation of Lynn Cut                  |
| 10C | King's Lynn                               |
| 11A | The Wash - Central Part                   |
| 11B | Continuation of the River Nene            |
| 11C | Continuation of the River Nene to Wisbech |
| 12A | The Wash - Western Part                   |
| 12B | Approaches to Boston                      |
| 12C | Boston                                    |
| 13  | Gibraltar Point to Saltfleet              |
| 14  | Approaches to the River Humber            |
| 15  | River Humber Entrance                     |
| 16  | Spurn Head to Grimsby Middle              |
| 17A | Approaches to Grimsby                     |
| 17B | Grimsby                                   |
| 18A | Immingham to Saltend                      |
| 18B | Goole                                     |
| 19A | Kingston Upon Hull to Humber Bridge       |
| 19B | Humber Bridge to Whitton Ness             |
| 19C | Hull Docks - Western Part                 |
| 20A | Lowestoft Harbour                         |
| 20B | Whitton Ness to Goole and Mere Dyke       |
| 20C | Continuation to Keadby                    |
| 21  | Spurn Head to Flamborough Head            |
| 22A | Bridlington to Scarborough                |
| 22B | Bridlington Harbour                       |
| 23A | Approaches to Whitby                      |
| 23B | Whitby Harbour                            |
| 23C | Scarborough Bay                           |
| 23D | Scarborough Harbour                       |
| 24  | Scarborough to Whitby                     |
| 25  | Southern North Sea                        |

|    |                                       |
|----|---------------------------------------|
| 1A | Orford Ness to Benacre Ness           |
| 1B | Orford Ness                           |
| 2  | Lowestoft to Winterton Ness           |
| 3  | Approaches to Lowestoft               |
| 4A | Approaches to Great Yarmouth          |
| 4B | Great Yarmouth Outer Harbour          |
| 5A | Northern Approaches to Great Yarmouth |
| 5B | Great Yarmouth Haven                  |
| 6A | Caister-on-Sea to Mundesley           |
| 6B | Southwold Harbour                     |

## Notes

**Positions** are referred to the WGS84 compatible datum, European Terrestrial Reference System 1989 Datum.

**Depths** are in metres and are reduced to Chart Datum, which is approximately the level of Lowest Astronomical Tide.

**Heights** are in metres: Underlined figures are drying heights above Chart Datum. Vertical clearance heights are above Highest Astronomical Tide. All other heights are above Mean High Water Springs.

**Navigational marks:** IALA Maritime Buoyage System-Region A (Red to port)

### DATUM

All the charts are referred to the WGS84 compatible datum ETRS89. Any positions taken from GPS (referred to WGS84) or from ADMIRALTY Notices to Mariners (referred to ETRS89) can be plotted directly on all charts.

### OIL AND GAS FIELDS

Within the area covered by larger scale charts, certain fixed structures, pipelines and cables have been omitted due to their complexity and frequent change. The appropriate larger scale charts should be used in these areas.

Production platforms and associated structures, including tanker moorings, storage tankers and platforms on pipelines, generally exhibit Mo(U) lights, aircraft obstruction lights, and audible fog signals. Unauthorised navigation is prohibited within 500 metres of all such structures.

### OVERHEAD CABLES

Overhead cables may conduct high voltages; contact with or proximity to these poses extreme danger. Sufficient clearance must be allowed.

### LIGHTS

Light stars without legends represent two fixed lights displayed vertically.

### SANDWAVE AREAS

Sandwaves exist in the areas indicated; depths may be less than charted.

### FISHING POTS

Mariners may encounter unmarked pots in an area of The Wash between the North Well and Roaring Middle aids to navigation. The buoys marking the ends of the strings of pots are reported as only visible at low water.

### DONNA NOOK FIRING RANGE

Although no restrictions are placed on the right to transit the firing practice area at any time, mariners are advised to exercise particular caution whilst in the area due to intense military air activity conducted at low level. Red flags or red lights are displayed to indicate that the area is in use. The firing practice area is operated using a clear range procedure. Exercise and firing only take place within the surface danger area (marked by the Sea Danger Area Buoys - DZ Numbers 1-6 and the coast) when the area is considered to be clear of all shipping. For further details, see Annual Notice to Mariners Number 5, Byelaws, Practice and Exercise Areas (PEXA) charts and ADMIRALTY Sailing Directions.

### VESSEL REPORTING

For details of the following vessel traffic services and vessel reporting systems, see ADMIRALTY List of Radio Signals:

- Boston Local Port Service
- Great Yarmouth Local Port Service
- Humber Vessel Traffic Service
- King's Lynn Port Information Service

### HISTORIC WRECKS

The sites of historic wrecks are protected from unauthorised interference.

### SUBMARINE CABLES AND PIPELINES

Mariners are advised not to anchor or trawl in the vicinity of submarine cables and pipelines. Pipelines are not always buried and their presence may significantly reduce the charted depth. They may also span seabed undulations and cause fishing gear to become irrecoverably snagged, putting a vessel in severe danger.

### FIRING PRACTICE AREAS

No restrictions are placed on the right to transit the firing practice areas at any time. The firing practice areas are operated using a clear range procedure; exercises and firing only take place when the areas are considered to be clear of all shipping.

## HM Coastguard Services and Safety Information

### VHF MARITIME RADIO

Coastguard Maritime Rescue Co-ordination Centres are on constant watch on Channel 16 - the distress, safety and calling channel. Initial calls should normally be on Ch 16.

### HM COASTGUARD

#### HUMBER COASTGUARD OPERATIONS CENTRE (CGOC)

Tel. +44 (0) 1262 672317

MMSI: 002320007

e-mail: zone8@hmcg.gov.uk (FAO Humber Coastguard)

#### LONDON COASTGUARD

Tel. +44 (0) 208 3127380

MMSI: 002320063

e-mail: zone12@hmcg.gov.uk (FAO London Coastguard)

### MARITIME SAFETY INFORMATION

Maritime Safety Information (MSI) in the UK is broadcast by HUMBER COASTGUARD at 0150, 0450, 0750, 1050, 1350, 1650, 1950 and 2250 (local times). These will include gale warnings, local inshore forecasts and navigational warnings. Mariners should listen to the MSI announcement on VHF Channel 16 for details of the working channel to be used for the broadcast.

## Distress and Safety Communication

### Distress - Urgency

A Distress or Urgency message has absolute priority. Make a call on VHF Channel 16 and give the following essential information:

**Distress** Call **MAYDAY MAYDAY MAYDAY**

- Name and Call Sign and MMSI number
- Position
- Nature of Distress
- Type of assistance required
- Type of boat - number of crew - intentions

**Urgency** (eg. if you break down in bad weather or a crewman requires medical attention) Call **PANPAN PANPAN PANPAN** and give:

- Name and Call Sign and MMSI number
- Position
- Nature of Distress
- Type of assistance required
- Type of boat - number of crew - intentions

### Other Distress Signals

Other recognised signals are:

- Red flares (parachute, multi stars or hand held)
- Orange smoke signal
- The flag signal NC
- The morse signal SOS ... --- ... by light
- An article of clothing on an oar
- Slowly and repeatedly raising and lowering outstretched arms
- A square flag with anything resembling a ball above or below it
- Continuous sounding of a siren or whistle will also be recognised, or smoke and flames from the vessel
- The carriage of an Emergency Position Indicating Radio Beacon (406 EPIRB) will improve your chances of being located if conventional means fail. 406 EPIRBs are detected by satellite, in addition to aircraft, and transmitted to a Coastguard Maritime Rescue Co-ordination Centre.

### THE USE OF MOBILE TELEPHONES IN DISTRESS AND SAFETY COMMUNICATIONS

The use of mobile telephones in the marine environment offshore is now well established, with users in all areas of the commercial, fishing and leisure communities.

Incidents have occurred where vessels requiring assistance from rescue services have used the inland emergency service, or alternatively telephoned direct to request assistance. (e.g. Lifeboat services). This procedure through a mobile telephone is **strongly discouraged**.

Use of mobile telephones by-passes the existing dedicated well-established international marine distress communications systems.

Mobile telephone coverage offshore is limited and does not afford the same extensive safety coverage as VHF Channel 16. Consequently a greater risk exists of communications difficulties or even a complete breakdown if an accident should occur at the edge of a cell coverage area.

Subsequent on-scene communications would be restricted and delayed if mobile telephone communications were exclusively maintained throughout. There is always a risk that elements of vital information could be lost or misinterpreted by the introduction of further relay links in the communication chain. Mobile telephones are also highly susceptible to failure due to water ingress.

It is not possible to communicate direct to another vessel able to render assistance unless that vessel is also fitted with a mobile telephone and the telephone number is known. Requests for assistance cannot be monitored by other vessels in a position to render assistance. Valuable time would be lost whilst the relevant Coastguard Rescue Coordination Centre receives and then re-broadcasts the information to all ships on the appropriate distress channel(s).

**In the interests of Safety Of Life At Sea (SOLAS), owners of vessels are urged to carry MARINE communications equipment onboard and to use this medium as the primary means of Distress and Safety communications.**

## Product Specifications

### PRODUCT USAGE CAUTION

This product is specifically designed, in conjunction with other charts and publications, as an aid to the navigation of leisure craft and locally regulated workboats and fishing vessels and therefore should be used by competent (preferably qualified) maritime navigators. Although this product contains the best information available at the time of publication, the user should navigate with caution, particularly in areas of shallow or confined waters where the depth of water is likely to change due to local conditions. The information provided in this product comes from the latest source information held and is updated by Notice to Mariners upon receipt of new information critical to safe navigation. To help maintain this product for all users, users are asked to notify the United Kingdom Hydrographic Office of any differences found between what is depicted and actual conditions encountered.

### KEEPING THIS CHART UPDATED

Updates for the charts are published using the Notices to Mariners Service on the ADMIRALTY Notices to Mariners page found on our website at [admiralty.co.uk/msi](http://admiralty.co.uk/msi). All updates for the latest edition of the chart are listed and can be quickly and easily downloaded. All the charts are derived from standard ADMIRALTY charts. No updates are applied to the charts by the United Kingdom Hydrographic Office or its agents after printing. For those who do not have internet access, please contact Tel. 01823 484444 for assistance.

### TIDAL STREAMS

Full details of the tidal streams in the area covered these charts are given in the following Admiralty Tidal Stream Atlas: NP 251 North Sea, Southern Part.

### PROVIDE UPDATED INFORMATION

To help maintain this product users are asked to notify the United Kingdom Hydrographic Office of any differences found between what is depicted and actual conditions encountered. Users can do this by submitting a Hydrographic Note form, found on our website [admiralty.co.uk/msi](http://admiralty.co.uk/msi) or by downloading our H-Note App. The H-Note App is freely available to download on Android and iOS devices. For more information please see here:



### IMPROVEMENTS TO THIS PRODUCT

ADMIRALTY Small Craft Charts are designed for use on leisure craft and locally regulated workboats and fishing vessels, where the smaller format charts fit more conveniently into the limited space available. Users with specific suggestions for the improvement of this product or ideas for the expansion of the series are requested to forward their comments to:

Customer Services, The UK Hydrographic Office,  
Admiralty Way, Taunton. +44(0)1823 484444  
E-mail [customerservices@ukho.gov.uk](mailto:customerservices@ukho.gov.uk)

To view all ADMIRALTY Products and services, visit [admiralty.co.uk](http://admiralty.co.uk)

### Tidal Stream Information

5614.1 (A) Tidal Streams referred to HW at DOVER

| Hours             | Geographical Position           | 52°27'0N<br>1 59.5 E | 52°24'5N<br>1 49.1 E | 52°20'0N<br>1 59.8 E | 52°18'2N<br>1 41.9 E | 52°15'4N<br>1 48.8 E | 52°12'7N<br>1 38.3 E | 52°04'9N<br>1 38.3 E |         |     |         |     |         |     |         |
|-------------------|---------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|---------|-----|---------|-----|---------|-----|---------|
| Before High Water | Directions of streams (degrees) | 038                  | 0-1 0-0              | 198                  | 0-1 0-1              | 018                  | 0-5 0-3              | 318                  | 0-4 0-2 | 012 | 0-5 0-3 | 191 | 1-0 0-5 | 147 | 0-2 0-1 |
|                   |                                 | 174                  | 1-1 0-6              | 193                  | 1-7 0-9              | 188                  | 0-9 0-5              | 209                  | 1-1 0-6 | 191 | 1-0 0-6 | 187 | 1-3 0-6 | 217 | 1-7 1-1 |
|                   |                                 | 180                  | 2-0 1-1              | 195                  | 2-5 1-3              | 190                  | 2-2 1-2              | 208                  | 1-7 1-0 | 195 | 2-2 1-5 | 185 | 1-2 0-6 | 215 | 2-5 1-6 |
|                   |                                 | 184                  | 2-2 1-2              | 196                  | 2-5 1-4              | 194                  | 2-7 1-5              | 207                  | 1-7 1-0 | 197 | 2-7 1-8 | 185 | 1-1 0-5 | 214 | 2-6 1-7 |
|                   |                                 | 189                  | 1-9 1-0              | 197                  | 2-1 1-1              | 195                  | 2-4 1-3              | 208                  | 1-6 0-9 | 197 | 2-4 1-6 | 187 | 0-7 0-3 | 213 | 2-4 1-6 |
|                   |                                 | 194                  | 1-4 0-8              | 197                  | 1-3 0-7              | 195                  | 1-6 0-8              | 214                  | 1-2 0-7 | 201 | 1-6 1-1 | 005 | 0-2 0-1 | 209 | 1-7 1-1 |
| High Water        | Rates at spring tides (knots)   | 209                  | 0-6 0-3              | 194                  | 0-1 0-1              | 195                  | 0-6 0-3              | 244                  | 0-4 0-2 | 192 | 0-7 0-5 | 007 | 1-2 0-6 | 183 | 0-5 0-3 |
|                   |                                 | 354                  | 0-9 0-5              | 016                  | 1-4 0-7              | 018                  | 0-5 0-3              | 026                  | 0-9 0-5 | 021 | 0-9 0-6 | 007 | 1-4 0-7 | 028 | 1-4 0-9 |
|                   |                                 | 005                  | 1-9 1-0              | 016                  | 2-5 1-3              | 015                  | 1-9 1-0              | 036                  | 1-9 1-1 | 017 | 2-1 1-4 | 007 | 1-1 0-5 | 029 | 2-8 1-8 |
|                   |                                 | 006                  | 2-3 1-2              | 018                  | 2-6 1-4              | 015                  | 2-8 1-5              | 034                  | 1-8 1-1 | 015 | 2-5 1-7 | 007 | 0-9 0-4 | 033 | 3-0 1-9 |
|                   |                                 | 006                  | 2-1 1-1              | 018                  | 2-1 1-2              | 012                  | 2-6 1-4              | 032                  | 1-6 0-9 | 014 | 2-4 1-6 | 007 | 0-7 0-3 | 033 | 2-6 1-7 |
|                   |                                 | 003                  | 1-5 0-8              | 018                  | 1-4 0-8              | 011                  | 1-9 1-0              | 026                  | 1-1 0-6 | 016 | 1-8 1-2 | 000 | 0-0 0-0 | 033 | 1-8 1-2 |
| After High Water  | Rates at neap tides (knots)     | 001                  | 0-7 0-4              | 018                  | 0-4 0-2              | 010                  | 1-0 0-5              | 340                  | 0-4 0-2 | 012 | 0-9 0-6 | 193 | 0-8 0-4 | 038 | 0-4 0-3 |

5614.1 (B) Tidal Streams referred to HW at HARWICH

| Hours             | Geographical Position           | 52°04'9N<br>1 38.3 E | 52°03'1N<br>1 31.6 E |     |         |
|-------------------|---------------------------------|----------------------|----------------------|-----|---------|
| Before High Water | Directions of streams (degrees) | 211                  | 0-8 0-5              | 224 | 1-1 0-7 |
|                   |                                 | 217                  | 2-0 1-3              | 221 | 2-1 1-3 |
|                   |                                 | 215                  | 2-5 1-7              | 220 | 2-0 1-3 |
|                   |                                 | 214                  | 2-5 1-7              | 220 | 1-8 1-1 |
|                   |                                 | 212                  | 2-2 1-3              | 222 | 1-4 0-9 |
|                   |                                 | 207                  | 1-2 0-6              | 246 | 0-6 0-4 |
| High Water        | Rates at spring tides (knots)   | 053                  | 0-3 0-2              | 034 | 1-0 0-6 |
|                   |                                 | 029                  | 2-0 1-3              | 058 | 1-9 1-2 |
|                   |                                 | 031                  | 2-9 1-9              | 056 | 2-0 1-3 |
|                   |                                 | 033                  | 2-8 1-8              | 054 | 1-6 1-0 |
|                   |                                 | 033                  | 2-2 1-5              | 048 | 1-1 0-7 |
|                   |                                 | 036                  | 1-2 0-8              | 037 | 0-7 0-4 |
| After High Water  | Rates at neap tides (knots)     | 033                  | 0-2 0-1              | 230 | 0-6 0-4 |

5614.2 Tidal Streams referred to HW at DOVER

| Hours             | Geographical Position           | 52°45'0N<br>1 52.9 E | 52°43'4N<br>1 46.8 E | 52°42'0N<br>2 00.0 E | 52°41'0N<br>1 54.9 E | 52°38'8N<br>1 49.0 E | 52°38'0N<br>1 54.4 E | 52°35'0N<br>1 45.9 E | 52°34'1N<br>1 59.9 E | 52°31'6N<br>1 51.3 E |         |     |         |     |         |     |         |     |         |
|-------------------|---------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|---------|-----|---------|-----|---------|-----|---------|-----|---------|
| Before High Water | Directions of streams (degrees) | 152                  | 0-8 0-6              | 154                  | 1-7 0-9              | 145                  | 0-4 0-2              | 325                  | 0-1 0-1              | 175                  | 1-1 0-6 | 004 | 0-2 0-0 | 178 | 1-5 0-9 | 133 | 0-3 0-1 | 159 | 0-4 0-2 |
|                   |                                 | 152                  | 2-7 1-8              | 153                  | 2-9 1-5              | 159                  | 1-9 1-0              | 170                  | 1-5 0-9              | 173                  | 3-3 1-8 | 178 | 1-8 1-2 | 177 | 2-0 1-3 | 168 | 1-5 0-8 | 179 | 2-3 1-3 |
|                   |                                 | 152                  | 3-3 2-4              | 150                  | 3-1 1-6              | 163                  | 2-5 1-4              | 169                  | 3-3 2-0              | 171                  | 3-1 1-7 | 179 | 2-9 1-9 | 174 | 2-4 1-5 | 174 | 2-4 1-3 | 177 | 3-4 1-9 |
|                   |                                 | 152                  | 3-4 2-4              | 149                  | 2-7 1-4              | 168                  | 2-5 1-4              | 165                  | 3-4 2-1              | 170                  | 2-6 1-4 | 179 | 3-5 2-2 | 176 | 1-9 1-2 | 178 | 2-7 1-4 | 182 | 2-8 1-6 |
|                   |                                 | 152                  | 2-5 2-0              | 149                  | 1-9 1-0              | 171                  | 1-8 1-0              | 166                  | 2-8 1-7              | 172                  | 1-9 1-0 | 179 | 2-9 2-1 | 179 | 1-6 1-0 | 192 | 2-1 1-2 | 184 | 2-2 1-2 |
|                   |                                 | 152                  | 1-2 0-9              | 151                  | 0-4 0-2              | 178                  | 0-8 0-5              | 174                  | 1-6 1-0              | 171                  | 0-7 0-4 | 179 | 1-8 1-4 | 183 | 0-6 0-4 | 199 | 1-4 0-7 | 184 | 1-2 0-7 |
| High Water        | Rates at spring tides (knots)   | 332                  | 0-2 0-2              | 337                  | 0-9 0-5              | 266                  | 0-2 0-1              | 205                  | 0-6 0-3              | 356                  | 0-8 0-4 | 180 | 0-4 0-2 | 354 | 0-9 0-6 | 237 | 0-3 0-2 |     | 0-0 0-0 |
|                   |                                 | 332                  | 1-8 1-3              | 335                  | 2-3 1-2              | 338                  | 1-2 0-6              | 347                  | 1-2 0-7              | 355                  | 2-5 1-3 | 357 | 1-2 0-9 | 000 | 1-8 1-2 | 348 | 1-4 0-8 | 004 | 1-3 0-7 |
|                   |                                 | 332                  | 3-3 2-3              | 334                  | 3-1 1-6              | 345                  | 2-2 1-2              | 358                  | 2-7 1-6              | 356                  | 3-0 1-6 | 359 | 2-7 1-8 | 002 | 2-4 1-5 | 354 | 2-3 1-2 | 003 | 2-8 1-6 |
|                   |                                 | 332                  | 3-4 2-4              | 330                  | 3-0 1-6              | 347                  | 2-5 1-4              | 348                  | 3-6 2-2              | 356                  | 2-9 1-6 | 359 | 3-3 2-3 | 000 | 2-1 1-4 | 356 | 2-4 1-3 | 003 | 3-1 1-8 |
|                   |                                 | 332                  | 3-1 2-2              | 327                  | 2-4 1-2              | 347                  | 2-2 1-2              | 347                  | 3-2 1-9              | 353                  | 2-3 1-2 | 359 | 3-1 2-1 | 355 | 1-4 0-9 | 358 | 2-2 1-2 | 357 | 3-0 1-7 |
|                   |                                 | 332                  | 1-8 1-4              | 329                  | 1-1 0-6              | 348                  | 1-5 0-8              | 348                  | 2-3 1-4              | 350                  | 1-2 0-7 | 359 | 2-2 1-6 | 347 | 0-8 0-5 | 002 | 1-5 0-8 | 350 | 1-8 1-0 |
| After High Water  | Rates at neap tides (knots)     | 332                  | 0-1 0-1              | 154                  | 1-0 0-5              | 358                  | 0-2 0-1              | 345                  | 0-5 0-3              | 196                  | 0-2 0-1 | 000 | 1-0 0-7 | 195 | 0-8 0-5 | 018 | 0-6 0-3 | 017 | 0-4 0-2 |

5614.2 continued

| 52°28'0N<br>1 49.9 E | 52°27'0N<br>1 59.5 E |     |         |
|----------------------|----------------------|-----|---------|
| 195                  | 0-4 0-2              | 038 | 0-1 0-0 |
| 211                  | 2-2 1-2              | 174 | 1-1 0-6 |
| 220                  | 3-3 1-8              | 180 | 2-0 1-1 |
| 212                  | 2-7 1-5              | 184 | 2-2 1-2 |
| 207                  | 1-9 1-1              | 189 | 1-9 1-0 |
| 207                  | 1-0 0-6              | 194 | 1-4 0-8 |
| 200                  | 0-2 0-1              | 209 | 0-6 0-3 |
| 001                  | 1-1 0-6              | 354 | 0-9 0-5 |
| 000                  | 2-6 1-5              | 005 | 1-9 1-0 |
| 000                  | 2-7 1-5              | 006 | 2-3 1-2 |
| 002                  | 2-4 1-3              | 006 | 2-1 1-1 |
| 008                  | 1-5 0-9              | 003 | 1-5 0-8 |
| 010                  | 0-4 0-2              | 001 | 0-7 0-4 |

5614.3 Tidal Streams referred to HW at DOVER

| Hours             | Geographical Position           | 52°31'63N<br>1 51.29 E | 52°28'03N<br>1 49.89 E | 52°27'93N<br>1 46.79 E |         |         |         |         |
|-------------------|---------------------------------|------------------------|------------------------|------------------------|---------|---------|---------|---------|
| Before High Water | Directions of streams (degrees) | -6                     | 159                    | 0-4 0-2                | 195     | 0-4 0-2 | 208     | 0-4 0-2 |
|                   |                                 | -5                     | 179                    | 2-3 1-3                | 211     | 2-2 1-2 | 192     | 2-4 1-4 |
|                   |                                 | -4                     | 177                    | 3-4 1-9                | 220     | 3-3 1-8 | 188     | 2-6 1-4 |
|                   |                                 | -3                     | 182                    | 2-8 1-6                | 212     | 2-7 1-5 | 187     | 2-2 1-2 |
|                   |                                 | -2                     | 184                    | 2-2 1-2                | 207     | 1-9 1-1 | 187     | 1-7 0-9 |
|                   |                                 | -1                     | 184                    | 1-2 0-7                | 207     | 1-0 0-6 | 187     | 1-0 0-6 |
| High Water        | Rates at spring tides (knots)   | 0                      | 0-0 0-0                | 200                    | 0-2 0-1 | 060     | 0-1 0-1 |         |
|                   |                                 | +1                     | 004                    | 1-3 0-7                | 001     | 1-1 0-6 | 015     | 2-3 1-3 |
|                   |                                 | +2                     | 003                    | 2-8 1-6                | 000     | 2-6 1-5 | 011     | 2-6 1-5 |
|                   |                                 | +3                     | 003                    | 3-1 1-8                | 000     | 2-7 1-5 | 008     | 2-3 1-3 |
|                   |                                 | +4                     | 357                    | 3-0 1-7                | 002     | 2-4 1-3 | 005     | 2-0 1-1 |
|                   |                                 | +5                     | 350                    | 1-8 1-0                | 008     | 1-5 0-9 | 001     | 1-3 0-7 |
| After High Water  | Rates at neap tides (knots)     | +6                     | 017                    | 0-4 0-2                | 010     | 0-4 0-2 | 327     | 0-2 0-1 |

5614.4 (A) Tidal Streams referred to HW at DOVER

| Hours             | Geographical Position           | 52°35'03 N<br>1 45 89 E |
|-------------------|---------------------------------|-------------------------|
| Before High Water | Directions of streams (degrees) | 178 1.5 0.9             |
|                   |                                 | 177 2.0 1.3             |
|                   |                                 | 174 2.4 1.5             |
|                   |                                 | 176 1.9 1.2             |
|                   |                                 | 179 1.6 1.0             |
|                   |                                 | 183 0.6 0.4             |
| High Water        | Rates at spring tides (knots)   | 354 0.9 0.6             |
|                   |                                 | 000 1.8 1.2             |
|                   |                                 | 002 2.4 1.5             |
|                   |                                 | 000 2.1 1.4             |
|                   |                                 | 355 1.4 0.9             |
|                   |                                 | 347 0.8 0.5             |
| After High Water  | Rates at neap tides (knots)     | 195 0.8 0.5             |

5614.5 (A) Tidal Streams referred to HW at DOVER

| Hours             | Geographical Position           | 52°41'03 N<br>1 45 39 E | 52°35'03 N<br>1 45 89 E |
|-------------------|---------------------------------|-------------------------|-------------------------|
| Before High Water | Directions of streams (degrees) | 152 0.7 0.5             | 178 1.5 0.9             |
|                   |                                 | 152 1.7 1.1             | 177 2.0 1.3             |
|                   |                                 | 152 2.2 1.5             | 174 2.4 1.5             |
|                   |                                 | 152 1.9 1.4             | 176 1.9 1.2             |
|                   |                                 | 152 1.3 1.0             | 179 1.6 1.0             |
|                   |                                 | 152 0.6 0.3             | 183 0.6 0.4             |
| High Water        | Rates at spring tides (knots)   | 332 0.5 0.3             | 354 0.9 0.6             |
|                   |                                 | 332 1.4 1.0             | 000 1.8 1.2             |
|                   |                                 | 332 2.1 1.4             | 002 2.4 1.5             |
|                   |                                 | 332 2.1 1.4             | 000 2.1 1.4             |
|                   |                                 | 332 1.5 1.1             | 355 1.4 0.9             |
|                   |                                 | 332 0.8 0.6             | 347 0.8 0.5             |
| After High Water  | Rates at neap tides (knots)     | 152 0.3 0.1             | 195 0.8 0.5             |

5614.6 (A) Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 52°59'0 N<br>1 34 9 E | 52°52'5 N<br>1 49 9 E | 52°50'0 N<br>1 47 9 E | 52°43'4 N<br>1 46 8 E | 52°38'8 N<br>1 49 0 E |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Before High Water | Directions of streams (degrees) | 327 1.7 1.0           | 328 2.3 1.2           | 321 1.2 0.7           | 335 2.2 1.2           | 175 1.1 0.6           |
|                   |                                 | 327 2.6 1.5           | 327 2.8 1.4           | 321 2.2 1.3           | 334 3.1 1.6           | 173 3.3 1.8           |
|                   |                                 | 327 2.7 1.6           | 327 2.7 1.4           | 321 2.7 1.5           | 330 3.0 1.6           | 171 3.1 1.7           |
|                   |                                 | 327 1.9 1.1           | 326 2.1 1.1           | 321 2.5 1.4           | 327 2.4 1.2           | 170 2.6 1.4           |
|                   |                                 | 327 0.7 0.5           | 324 0.9 0.5           | 321 1.5 0.8           | 329 1.2 0.6           | 172 1.9 1.0           |
|                   |                                 | 147 0.6 0.3           | 142 0.8 0.4           | 321 0.2 0.1           | 155 0.9 0.5           | 171 0.7 0.4           |
| High Water        | Rates at spring tides (knots)   | 147 1.6 0.9           | 145 2.1 1.1           | 141 1.2 0.7           | 153 2.3 1.2           | 356 0.8 0.4           |
|                   |                                 | 147 2.4 1.4           | 148 2.8 1.4           | 141 2.4 1.3           | 151 3.0 1.6           | 355 2.5 1.3           |
|                   |                                 | 147 2.4 1.5           | 146 2.6 1.3           | 141 2.5 1.5           | 149 2.9 1.5           | 356 3.0 1.6           |
|                   |                                 | 147 1.9 1.2           | 146 1.9 1.0           | 141 2.1 1.3           | 149 2.3 1.2           | 356 2.9 1.6           |
|                   |                                 | 147 1.1 0.6           | 153 0.8 0.4           | 141 1.4 0.8           | 150 1.1 0.6           | 353 2.3 1.2           |
|                   |                                 | 327 0.1 0.1           | 320 0.5 0.3           | 141 0.4 0.2           | 341 0.2 0.1           | 350 1.2 0.7           |
| After High Water  | Rates at neap tides (knots)     | 327 1.3 0.7           | 329 1.8 0.9           | 321 0.8 0.4           | 336 1.6 0.8           | 196 0.2 0.1           |

5614.6 (B) Tidal Streams referred to HW at HARWICH

| Hours             | Geographical Position           | 52°18'88 N<br>1 40 34 E |
|-------------------|---------------------------------|-------------------------|
| Before High Water | Directions of streams (degrees) | 305 1.1 0.7             |
|                   |                                 | 305 1.0 0.6             |
|                   |                                 | 305 1.3 0.8             |
|                   |                                 | 305 1.6 1.0             |
|                   |                                 | 305 1.2 0.7             |
|                   |                                 | 305 0.1 0.1             |
| High Water        | Rates at spring tides (knots)   | 125 1.4 0.9             |
|                   |                                 | 125 2.5 1.6             |
|                   |                                 | 125 3.1 1.9             |
|                   |                                 | 125 3.3 2.0             |
|                   |                                 | 125 2.4 1.5             |
|                   |                                 | 125 0.2 0.1             |
| After High Water  | Rates at neap tides (knots)     | 305 1.3 0.8             |

5614.7 (A) Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 53°01'02 N<br>0 58 39 E | 53°05'42 N<br>1 13 09 E | 53°00'02 N<br>1 19 89 E |
|-------------------|---------------------------------|-------------------------|-------------------------|-------------------------|
| Before High Water | Directions of streams (degrees) | 283 1.9 1.0             | 300 1.9 1.0             | 294 2.3 1.1             |
|                   |                                 | 282 1.8 1.0             | 296 2.4 1.2             | 289 2.5 1.2             |
|                   |                                 | 281 1.7 0.9             | 289 2.4 1.2             | 285 2.4 1.2             |
|                   |                                 | 270 1.4 0.7             | 281 1.6 0.8             | 280 1.8 0.9             |
|                   |                                 | 227 0.2 0.1             | 248 0.4 0.2             | 254 0.3 0.1             |
|                   |                                 | 122 0.7 0.4             | 131 0.7 0.4             | 119 1.3 0.6             |
| High Water        | Rates at spring tides (knots)   | 108 1.6 0.8             | 120 1.6 0.8             | 114 2.1 1.0             |
|                   |                                 | 102 2.1 1.1             | 115 2.1 1.1             | 108 2.5 1.2             |
|                   |                                 | 098 2.1 1.1             | 111 2.1 1.1             | 106 2.4 1.2             |
|                   |                                 | 094 1.6 0.8             | 109 1.6 0.8             | 104 1.5 0.7             |
|                   |                                 | 087 0.7 0.4             | 087 0.6 0.3             | 082 0.4 0.2             |
|                   |                                 | 303 0.5 0.3             | 326 0.6 0.3             | 303 1.1 0.5             |
| After High Water  | Rates at neap tides (knots)     | 290 1.4 0.7             | 301 1.6 0.8             | 296 2.1 1.0             |

5614.8 Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 53°37'0 N<br>0 26 4 E | 53°35'3 N<br>0 39 7 E | 53°33'7 N<br>0 59 2 E | 53°27'0 N<br>1 04 9 E | 53°19'0 N<br>0 33 9 E | 53°14'5 N<br>0 56 9 E | 53°09'7 N<br>0 29 9 E | 53°08'3 N<br>0 54 4 E | 53°08'0 N<br>0 40 0 E |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Before High Water | Directions of streams (degrees) | 332 0.8 0.5           | 344 1.9 1.1           | 329 1.7 0.9           | 324 2.2 0.9           | 358 1.1 0.6           | 327 1.7 1.0           | 352 0.4 0.2           | 320 1.5 0.8           | 315 1.6 0.8           |
|                   |                                 | 227 0.3 0.2           | 335 0.9 0.5           | 324 1.4 0.7           | 321 1.7 0.7           | 328 0.5 0.2           | 313 1.5 0.9           | 326 0.2 0.1           | 313 1.7 0.9           | 303 1.4 0.7           |
|                   |                                 | 180 1.6 0.9           | 183 0.9 0.5           | 310 0.6 0.3           | 315 0.8 0.4           | 216 0.8 0.4           | 298 1.3 0.8           | 205 0.9 0.5           | 291 1.1 0.6           | 266 0.9 0.5           |
|                   |                                 | 175 2.3 1.3           | 172 2.5 1.4           | 180 0.5 0.3           | 172 0.3 0.1           | 191 1.5 0.8           | 274 0.7 0.4           | 199 2.1 1.1           | 260 0.4 0.2           | 205 1.0 0.5           |
|                   |                                 | 171 2.4 1.4           | 168 2.8 1.6           | 169 1.4 0.7           | 151 1.4 0.5           | 185 1.8 0.9           | 196 0.6 0.3           | 195 2.1 1.1           | 178 0.6 0.3           | 176 1.1 0.6           |
|                   |                                 | 166 1.9 1.1           | 163 2.9 1.6           | 162 1.5 0.8           | 145 1.8 0.7           | 185 1.6 0.8           | 162 1.2 0.7           | 188 1.3 0.7           | 155 1.1 0.5           | 159 1.1 0.6           |
| High Water        | Rates at spring tides (knots)   | 165 0.9 0.5           | 161 2.0 1.1           | 153 1.5 0.8           | 141 1.7 0.9           | 177 1.1 0.6           | 149 1.5 0.8           | 171 0.7 0.4           | 139 1.5 0.8           | 137 1.2 0.6           |
|                   |                                 | 310 0.1 0.0           | 163 1.0 0.5           | 147 1.4 0.7           | 140 1.4 0.7           | 135 0.6 0.3           | 134 1.5 0.9           | 050 0.6 0.3           | 125 1.5 0.8           | 112 1.3 0.7           |
|                   |                                 | 000 1.0 0.6           | 347 0.5 0.3           | 132 0.9 0.5           | 135 1.0 0.5           | 032 0.7 0.3           | 120 1.3 0.8           | 021 0.9 0.5           | 112 1.1 0.6           | 095 1.1 0.6           |
|                   |                                 | 004 1.9 1.1           | 352 1.6 0.9           | 049 0.6 0.3           | 102 0.3 0.1           | 013 1.2 0.6           | 105 1.0 0.5           | 016 1.4 0.7           | 091 0.6 0.3           | 058 0.8 0.4           |
|                   |                                 | 357 2.1 1.2           | 351 2.5 1.4           | 357 1.0 0.6           | 335 0.8 0.3           | 009 1.5 0.8           | 056 0.5 0.3           | 012 1.9 1.0           | 016 0.3 0.2           | 007 0.9 0.5           |
|                   |                                 | 350 1.9 1.1           | 348 2.6 1.5           | 337 1.4 0.8           | 327 1.7 0.7           | 006 1.5 0.8           | 352 1.0 0.5           | 007 1.6 0.8           | 338 0.8 0.4           | 339 1.2 0.6           |
| After High Water  | Rates at neap tides (knots)     | 341 1.2 0.7           | 344 2.3 1.3           | 331 1.6 0.9           | 325 2.2 0.9           | 001 1.2 0.7           | 331 1.6 0.9           | 000 0.6 0.3           | 325 1.3 0.7           | 323 1.5 0.8           |

5614.8 continued

| 53°01'2 N<br>0 25 8 E | 53°01'0 N<br>0 58 4 E |
|-----------------------|-----------------------|
| 025 0.5 0.3           | 283 1.9 1.0           |
| 330 0.1 0.1           | 282 1.8 1.0           |
| 223 0.5 0.3           | 281 1.7 0.9           |
| 213 1.5 0.8           | 270 1.4 0.7           |
| 212 2.2 1.2           | 227 0.2 0.1           |
| 212 1.9 1.0           | 122 0.7 0.4           |
| 212 1.0 0.5           | 108 1.6 0.8           |
| 182 0.1 0.1           | 102 2.1 1.1           |
| 032 0.8 0.4           | 098 2.1 1.1           |
| 035 1.7 0.9           | 094 1.6 0.8           |
| 038 2.0 1.0           | 087 0.7 0.4           |
| 037 1.5 0.8           | 303 0.5 0.3           |
| 031 0.8 0.4           | 290 1.4 0.7           |

5614.9

Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 53°09'72N<br>0 29.89E | 53°08'42N<br>0 23.39E | 53°08'02N<br>0 39.99E | 53°03'12N<br>0 20.09E | 53°03'12N<br>0 23.89E | 53°02'32N<br>0 30.99E | 53°02'22N<br>0 33.99E | 53°01'22N<br>0 25.79E |     |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----|
| Before High Water | Directions of streams (degrees) | 6                     | 352                   | 000                   | 315                   | 313                   | 000                   | 013                   | 302                   | 025 |
|                   |                                 | 5                     | 326                   | 180                   | 303                   | 230                   | 220                   | 000                   | 302                   | 330 |
|                   |                                 | 4                     | 205                   | 180                   | 266                   | 216                   | 209                   | 200                   | 303                   | 283 |
|                   |                                 | 3                     | 199                   | 180                   | 205                   | 213                   | 206                   | 205                   | 225                   | 213 |
|                   |                                 | 2                     | 195                   | 180                   | 176                   | 213                   | 205                   | 211                   | 182                   | 212 |
|                   |                                 | 1                     | 188                   | 180                   | 159                   | 214                   | 205                   | 210                   | 155                   | 212 |
| High Water        | Rates at spring tides (knots)   | 6                     | 171                   | 180                   | 137                   | 249                   | 198                   | 203                   | 128                   | 212 |
|                   |                                 | 5                     | 050                   | 000                   | 112                   | 035                   | 036                   | 064                   | 108                   | 182 |
|                   |                                 | 4                     | 021                   | 000                   | 095                   | 047                   | 029                   | 034                   | 096                   | 032 |
|                   |                                 | 3                     | 016                   | 000                   | 058                   | 049                   | 029                   | 031                   | 077                   | 035 |
|                   |                                 | 2                     | 012                   | 000                   | 007                   | 042                   | 025                   | 026                   | 018                   | 038 |
|                   |                                 | 1                     | 007                   | 000                   | 339                   | 032                   | 020                   | 018                   | 322                   | 037 |
| After High Water  | Rates at neap tides (knots)     | 6                     | 000                   | 000                   | 323                   | 000                   | 015                   | 015                   | 306                   | 031 |
|                   |                                 | 5                     | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000 |
|                   |                                 | 4                     | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000 |
|                   |                                 | 3                     | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000 |
|                   |                                 | 2                     | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000 |
|                   |                                 | 1                     | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000                   | 000 |

5614.9 continued

| Hours | Geographical Position | 52°57'22N<br>0 28.09E |
|-------|-----------------------|-----------------------|
| 025   | 0.4 0.2               | 211                   |
| 211   | 0.7 0.3               | 206                   |
| 208   | 1.8 0.9               | 200                   |
| 208   | 2.4 1.2               | 197                   |
| 208   | 2.4 1.2               | 195                   |
| 208   | 1.7 0.8               | 203                   |
| 213   | 0.5 0.2               | 013                   |
| 027   | 0.7 0.4               | 025                   |
| 029   | 1.6 0.8               | 022                   |
| 030   | 2.1 1.0               | 020                   |
| 030   | 2.2 1.1               | 017                   |
| 030   | 1.8 0.9               | 007                   |
| 030   | 0.9 0.4               | 225                   |

5614.10 (A) Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 52°53'7N<br>0 24.3E | 52°57'2N<br>0 28.1E |     |
|-------------------|---------------------------------|---------------------|---------------------|-----|
| Before High Water | Directions of streams (degrees) | 6                   | 358                 | 211 |
|                   |                                 | 5                   | 203                 | 206 |
|                   |                                 | 4                   | 195                 | 200 |
|                   |                                 | 3                   | 192                 | 197 |
|                   |                                 | 2                   | 192                 | 195 |
|                   |                                 | 1                   | 192                 | 203 |
| High Water        | Rates at spring tides (knots)   | 6                   | 188                 | 013 |
|                   |                                 | 5                   | 021                 | 025 |
|                   |                                 | 4                   | 016                 | 022 |
|                   |                                 | 3                   | 014                 | 020 |
|                   |                                 | 2                   | 010                 | 017 |
|                   |                                 | 1                   | 007                 | 007 |
| After High Water  | Rates at neap tides (knots)     | 6                   | 003                 | 225 |
|                   |                                 | 5                   | 000                 | 000 |
|                   |                                 | 4                   | 000                 | 000 |
|                   |                                 | 3                   | 000                 | 000 |
|                   |                                 | 2                   | 000                 | 000 |
|                   |                                 | 1                   | 000                 | 000 |

5614.11 (A) Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 52°57'2N<br>0 07.6E | 52°57'6N<br>0 08.9E | 52°52'6N<br>0 15.5E |     |
|-------------------|---------------------------------|---------------------|---------------------|---------------------|-----|
| Before High Water | Directions of streams (degrees) | 6                   | 053                 | 057                 | 350 |
|                   |                                 | 5                   | 321                 | 138                 | 347 |
|                   |                                 | 4                   | 235                 | 215                 | 176 |
|                   |                                 | 3                   | 233                 | 221                 | 175 |
|                   |                                 | 2                   | 233                 | 222                 | 175 |
|                   |                                 | 1                   | 233                 | 237                 | 175 |
| High Water        | Rates at spring tides (knots)   | 6                   | 235                 | 240                 | 175 |
|                   |                                 | 5                   | 321                 | 048                 | 162 |
|                   |                                 | 4                   | 053                 | 048                 | 357 |
|                   |                                 | 3                   | 055                 | 048                 | 356 |
|                   |                                 | 2                   | 056                 | 048                 | 355 |
|                   |                                 | 1                   | 055                 | 041                 | 354 |
| After High Water  | Rates at neap tides (knots)     | 6                   | 054                 | 048                 | 352 |
|                   |                                 | 5                   | 000                 | 000                 | 000 |
|                   |                                 | 4                   | 000                 | 000                 | 000 |
|                   |                                 | 3                   | 000                 | 000                 | 000 |
|                   |                                 | 2                   | 000                 | 000                 | 000 |
|                   |                                 | 1                   | 000                 | 000                 | 000 |

5614.12 (A) Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 52°57'2N<br>0 07.6E | 52°57'6N<br>0 08.9E |     |
|-------------------|---------------------------------|---------------------|---------------------|-----|
| Before High Water | Directions of streams (degrees) | 6                   | 053                 | 057 |
|                   |                                 | 5                   | 321                 | 138 |
|                   |                                 | 4                   | 235                 | 215 |
|                   |                                 | 3                   | 233                 | 221 |
|                   |                                 | 2                   | 233                 | 222 |
|                   |                                 | 1                   | 233                 | 237 |
| High Water        | Rates at spring tides (knots)   | 6                   | 235                 | 240 |
|                   |                                 | 5                   | 321                 | 048 |
|                   |                                 | 4                   | 053                 | 048 |
|                   |                                 | 3                   | 055                 | 048 |
|                   |                                 | 2                   | 056                 | 048 |
|                   |                                 | 1                   | 055                 | 041 |
| After High Water  | Rates at neap tides (knots)     | 6                   | 054                 | 048 |
|                   |                                 | 5                   | 000                 | 000 |
|                   |                                 | 4                   | 000                 | 000 |
|                   |                                 | 3                   | 000                 | 000 |
|                   |                                 | 2                   | 000                 | 000 |
|                   |                                 | 1                   | 000                 | 000 |

5614.12 (B) Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 52°57'2N<br>0 07.6E |     |
|-------------------|---------------------------------|---------------------|-----|
| Before High Water | Directions of streams (degrees) | 6                   | 053 |
|                   |                                 | 5                   | 321 |
|                   |                                 | 4                   | 235 |
|                   |                                 | 3                   | 233 |
|                   |                                 | 2                   | 233 |
|                   |                                 | 1                   | 233 |
| High Water        | Rates at spring tides (knots)   | 6                   | 235 |
|                   |                                 | 5                   | 321 |
|                   |                                 | 4                   | 053 |
|                   |                                 | 3                   | 055 |
|                   |                                 | 2                   | 056 |
|                   |                                 | 1                   | 055 |
| After High Water  | Rates at neap tides (knots)     | 6                   | 054 |
|                   |                                 | 5                   | 000 |
|                   |                                 | 4                   | 000 |
|                   |                                 | 3                   | 000 |
|                   |                                 | 2                   | 000 |
|                   |                                 | 1                   | 000 |

5614.13 Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 53°19'02N<br>0 33.89E | 53°09'72N<br>0 29.89E | 53°08'42N<br>0 23.39E |     |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----|
| Before High Water | Directions of streams (degrees) | 6                     | 358                   | 352                   | 000 |
|                   |                                 | 5                     | 328                   | 326                   | 180 |
|                   |                                 | 4                     | 216                   | 205                   | 180 |
|                   |                                 | 3                     | 191                   | 199                   | 180 |
|                   |                                 | 2                     | 185                   | 195                   | 180 |
|                   |                                 | 1                     | 185                   | 188                   | 180 |
| High Water        | Rates at spring tides (knots)   | 6                     | 177                   | 171                   | 180 |
|                   |                                 | 5                     | 135                   | 050                   | 000 |
|                   |                                 | 4                     | 032                   | 021                   | 000 |
|                   |                                 | 3                     | 013                   | 016                   | 000 |
|                   |                                 | 2                     | 009                   | 012                   | 000 |
|                   |                                 | 1                     | 006                   | 007                   | 000 |
| After High Water  | Rates at neap tides (knots)     | 6                     | 001                   | 000                   | 000 |
|                   |                                 | 5                     | 000                   | 000                   | 000 |
|                   |                                 | 4                     | 000                   | 000                   | 000 |
|                   |                                 | 3                     | 000                   | 000                   | 000 |
|                   |                                 | 2                     | 000                   | 000                   | 000 |
|                   |                                 | 1                     | 000                   | 000                   | 000 |



5614-14

Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | A                     | B                     | C                     | D                     | E                     |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                   |                                 | 53°42'1 N<br>0 10·3 E | 53°37'5 N<br>0 19·9 E | 53°37'0 N<br>0 26·4 E | 53°33'8 N<br>0 13·7 E | 53°30'7 N<br>0 17·7 E |
| Before High Water | Directions of streams (degrees) | 320                   | 340                   | 332                   | 040                   | 347                   |
| High Water        | Rates at spring tides (knots)   | 0·4 0·2               | 0·5 0·3               | 0·8 0·5               | 0·7 0·4               | 0·6 0·3               |
| After High Water  | Rates at neap tides (knots)     | 1·3 0·6               | 0·5 0·2               | 0·3 0·2               | 0·6 0·2               | 0·3 0·1               |
|                   |                                 | 159                   | 175                   | 180                   | 209                   | 184                   |
|                   |                                 | 2·4 1·2               | 1·9 0·9               | 1·6 0·9               | 2·0 0·8               | 1·3 0·7               |
|                   |                                 | 161                   | 176                   | 175                   | 209                   | 185                   |
|                   |                                 | 2·5 1·2               | 2·3 1·1               | 2·3 1·3               | 2·6 1·3               | 2·0 1·0               |
|                   |                                 | 159                   | 174                   | 171                   | 209                   | 189                   |
|                   |                                 | 2·5 1·2               | 2·0 1·0               | 2·4 1·4               | 2·3 1·4               | 1·8 0·9               |
|                   |                                 | 155                   | 170                   | 166                   | 209                   | 189                   |
|                   |                                 | 1·4 0·7               | 1·3 0·7               | 1·9 1·1               | 1·6 1·1               | 1·2 0·6               |
|                   |                                 | 110                   | 153                   | 165                   | 209                   | 180                   |
|                   |                                 | 0·1 0·1               | 0·5 0·3               | 0·9 0·5               | 0·6 0·4               | 0·5 0·2               |
|                   |                                 | 347                   | 013                   | 310                   | 040                   | 013                   |
|                   |                                 | 1·1 0·6               | 0·4 0·2               | 0·1 0·0               | 0·6 0·4               | 0·4 0·2               |
|                   |                                 | 343                   | 357                   | 000                   | 040                   | 012                   |
|                   |                                 | 2·2 1·1               | 1·4 0·7               | 1·0 0·6               | 1·8 1·2               | 1·3 0·7               |
|                   |                                 | 339                   | 355                   | 004                   | 040                   | 013                   |
|                   |                                 | 2·6 1·3               | 2·1 1·1               | 1·9 1·1               | 3·2 1·6               | 1·6 0·8               |
|                   |                                 | 341                   | 351                   | 357                   | 040                   | 009                   |
|                   |                                 | 2·1 1·0               | 2·1 1·1               | 2·1 1·2               | 3·4 1·6               | 1·7 0·9               |
|                   |                                 | 333                   | 349                   | 350                   | 040                   | 003                   |
|                   |                                 | 1·5 0·7               | 1·6 0·8               | 1·9 1·1               | 2·7 1·3               | 1·5 0·7               |
|                   |                                 | 325                   | 342                   | 341                   | 040                   | 352                   |
|                   |                                 | 0·7 0·3               | 0·8 0·4               | 1·2 0·7               | 1·4 0·8               | 0·8 0·4               |

5614-15

Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

| Hours             | Geographical Position           | A                        | B                        | C                        | D                        | E                        | F                        | G                        |
|-------------------|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                   |                                 | 53°30'·72 N<br>0 17·69 E | 53°33'·82 N<br>0 13·69 E | 53°33'·32 N<br>0 07·50 E | 53°32'·62 N<br>0 06·10 E | 53°33'·92 N<br>0 06·10 E | 53°33'·82 N<br>0 05·60 E | 53°32'·72 N<br>0 04·40 E |
| Before High Water | Directions of streams (degrees) | 347                      | 040                      | 119                      | 180                      | 130                      | 126                      | 168                      |
| High Water        | Rates at spring tides (knots)   | 0·6 0·3                  | 0·7 0·4                  | 1·5 0·9                  | 0·1 0·1                  | 1·3 0·9                  | 0·9 0·5                  | 0·2 0·1                  |
| After High Water  | Rates at neap tides (knots)     | 0·3 0·1                  | 0·6 0·2                  | 1·4 0·6                  | 1·5 0·9                  | 1·8 0·7                  | 0·8 0·3                  | 0·6 0·3                  |
|                   |                                 | 207                      | 209                      | 239                      | 261                      | 331                      | 327                      | 296                      |
|                   |                                 | 1·3 0·7                  | 2·0 0·8                  | 3·1 1·4                  | 2·3 1·3                  | 2·6 1·1                  | 2·1 1·0                  | 3·06                     |
|                   |                                 | 184                      | 209                      | 283                      | 275                      | 323                      | 320                      | 306                      |
|                   |                                 | 2·0 1·0                  | 2·6 1·3                  | 3·8 1·8                  | 3·1 1·8                  | 3·8 1·7                  | 2·8 1·4                  | 3·01                     |
|                   |                                 | 185                      | 209                      | 281                      | 285                      | 310                      | 317                      | 301                      |
|                   |                                 | 1·8 0·9                  | 2·3 1·4                  | 3·4 1·6                  | 3·1 1·7                  | 3·4 1·5                  | 2·9 1·4                  | 3·02                     |
|                   |                                 | 189                      | 209                      | 273                      | 289                      | 304                      | 310                      | 302                      |
|                   |                                 | 2·2 0·6                  | 1·6 1·1                  | 2·84                     | 2·9 1·0                  | 2·71                     | 1·9 0·8                  | 3·01                     |
|                   |                                 | 180                      | 209                      | 318                      | 320                      | 106                      | 312                      | 295                      |
|                   |                                 | 0·5 0·2                  | 0·6 0·4                  | 0·9 0·4                  | 1·0 0·6                  | 0·3 0·2                  | 0·7 0·3                  | 0·7 0·3                  |
|                   |                                 | 013                      | 040                      | 051                      | 069                      | 135                      | 120                      | 087                      |
|                   |                                 | 0·4 0·2                  | 0·6 0·4                  | 1·6 0·9                  | 1·2 0·5                  | 2·3 1·4                  | 1·1 0·7                  | 1·0 0·5                  |
|                   |                                 | 012                      | 040                      | 076                      | 093                      | 122                      | 128                      | 100                      |
|                   |                                 | 1·3 0·7                  | 1·8 1·2                  | 2·7 1·5                  | 2·7 1·3                  | 3·3 1·9                  | 2·4 1·3                  | 2·5 1·2                  |
|                   |                                 | 013                      | 040                      | 106                      | 112                      | 119                      | 132                      | 113                      |
|                   |                                 | 1·6 0·8                  | 3·2 1·6                  | 4·1 2·3                  | 3·0 1·4                  | 4·3 2·5                  | 3·1 1·7                  | 2·5 1·2                  |
|                   |                                 | 009                      | 040                      | 109                      | 116                      | 122                      | 133                      | 107                      |
|                   |                                 | 1·7 0·9                  | 3·4 1·6                  | 4·0 2·2                  | 2·2 1·0                  | 3·7 2·1                  | 2·9 1·6                  | 1·7 0·8                  |
|                   |                                 | 003                      | 040                      | 109                      | 116                      | 125                      | 130                      | 123                      |
|                   |                                 | 1·5 0·7                  | 2·7 1·3                  | 2·8 1·6                  | 1·3 0·6                  | 2·6 1·6                  | 2·1 1·2                  | 1·3 0·6                  |
|                   |                                 | 352                      | 040                      | 112                      | 123                      | 126                      | 126                      | 157                      |
|                   |                                 | 0·8 0·4                  | 1·4 0·8                  | 1·8 1·1                  | 0·4 0·1                  | 1·8 1·2                  | 1·3 0·8                  | 0·6 0·2                  |

5614-16

Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

| Hours             | Geographical Position           | A                        | B                        | C                        | D                        | E                        | F                        |
|-------------------|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                   |                                 | 53°33'·32 N<br>0 07·50 E | 53°32'·62 N<br>0 06·10 E | 53°33'·92 N<br>0 06·10 E | 53°33'·82 N<br>0 05·60 E | 53°32'·72 N<br>0 04·40 E | 53°36'·59 N<br>0 00·75 E |
| Before High Water | Directions of streams (degrees) | 119                      | 180                      | 130                      | 126                      | 168                      | 100                      |
| High Water        | Rates at spring tides (knots)   | 1·5 0·9                  | 0·1 0·1                  | 1·3 0·9                  | 0·9 0·5                  | 0·2 0·1                  | 0·9 0·0                  |
| After High Water  | Rates at neap tides (knots)     | 1·4 0·6                  | 1·5 0·9                  | 1·8 0·7                  | 0·8 0·3                  | 0·6 0·3                  | 1·1 0·4                  |
|                   |                                 | 239                      | 261                      | 331                      | 327                      | 296                      | 288                      |
|                   |                                 | 3·1 1·4                  | 2·5 1·3                  | 2·6 1·1                  | 2·1 1·0                  | 1·8 0·9                  | 2·96                     |
|                   |                                 | 283                      | 285                      | 310                      | 317                      | 301                      | 294                      |
|                   |                                 | 3·8 1·8                  | 3·1 1·8                  | 3·8 1·7                  | 2·8 1·4                  | 2·2 1·1                  | 3·1 1·5                  |
|                   |                                 | 273                      | 289                      | 310                      | 310                      | 302                      | 306                      |
|                   |                                 | 3·4 1·6                  | 3·1 1·7                  | 3·4 1·5                  | 2·9 1·4                  | 2·3 1·1                  | 3·0 1·8                  |
|                   |                                 | 284                      | 298                      | 271                      | 308                      | 301                      | 317                      |
|                   |                                 | 2·9 1·0                  | 2·4 1·4                  | 1·9 0·8                  | 2·3 1·1                  | 1·8 0·9                  | 2·4 1·4                  |
|                   |                                 | 318                      | 320                      | 106                      | 312                      | 295                      | 345                      |
|                   |                                 | 0·9 0·4                  | 1·0 0·6                  | 0·3 0·2                  | 0·7 0·3                  | 0·7 0·3                  | 0·8 0·5                  |
|                   |                                 | 051                      | 069                      | 135                      | 120                      | 100                      | 090                      |
|                   |                                 | 1·6 0·9                  | 1·2 0·5                  | 2·3 1·4                  | 1·1 0·7                  | 1·0 0·5                  | 0·9 0·0                  |
|                   |                                 | 076                      | 093                      | 122                      | 128                      | 100                      | 116                      |
|                   |                                 | 2·7 1·5                  | 2·7 1·3                  | 3·3 1·9                  | 2·4 1·3                  | 2·5 1·2                  | 2·2 0·8                  |
|                   |                                 | 106                      | 112                      | 119                      | 132                      | 113                      | 116                      |
|                   |                                 | 4·1 2·3                  | 3·0 1·4                  | 4·3 2·5                  | 3·1 1·7                  | 2·5 1·2                  | 2·8 1·6                  |
|                   |                                 | 109                      | 116                      | 122                      | 133                      | 107                      | 113                      |
|                   |                                 | 4·0 2·2                  | 2·2 1·0                  | 3·7 2·1                  | 2·9 1·6                  | 1·7 0·8                  | 3·0 1·7                  |
|                   |                                 | 109                      | 116                      | 125                      | 130                      | 123                      | 117                      |
|                   |                                 | 2·8 1·6                  | 1·3 0·6                  | 2·6 1·6                  | 2·1 1·2                  | 1·3 0·6                  | 2·3 1·7                  |
|                   |                                 | 112                      | 123                      | 126                      | 126                      | 157                      | 100                      |
|                   |                                 | 1·8 1·1                  | 0·4 0·1                  | 1·8 1·2                  | 1·3 0·8                  | 0·6 0·2                  | 1·3 1·1                  |

5614-17 (A) Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

| Hours             | Geographical Position           | A                        | B                        | C                        |
|-------------------|---------------------------------|--------------------------|--------------------------|--------------------------|
|                   |                                 | 53°35'·52 N<br>0 01·80 W | 53°37'·00 N<br>0 02·27 W | 53°37'·12 N<br>0 06·70 W |
| Before High Water | Directions of streams (degrees) | 149                      | 105                      | 104                      |
| High Water        | Rates at spring tides (knots)   | 0·8 0·6                  | 1·4 0·0                  | 2·1 1·3                  |
| After High Water  | Rates at neap tides (knots)     | 0·5 0·3                  | 1·2 0·6                  | 0·1 0·2                  |
|                   |                                 | 221                      | 281                      | 290                      |
|                   |                                 | 1·2 0·5                  | 2·7 1·3                  | 2·1 0·9                  |
|                   |                                 | 270                      | 277                      | 280                      |
|                   |                                 | 1·2 0·5                  | 2·8 0·8                  | 3·5 1·1                  |
|                   |                                 | 280                      | 278                      | 297                      |
|                   |                                 | 1·7 0·7                  | 3·5 1·1                  | 2·9 1·3                  |
|                   |                                 | 287                      | 278                      | 297                      |
|                   |                                 | 1·7 0·7                  | 3·4 1·2                  | 2·9 1·3                  |
|                   |                                 | 290                      | 282                      | 294                      |
|                   |                                 | 1·2 0·4                  | 2·4 0·2                  | 2·6 1·2                  |
|                   |                                 | 276                      | 286                      | 300                      |
|                   |                                 | 0·4 0·1                  | 1·1 0·2                  | 1·5 0·6                  |
|                   |                                 | 117                      | 081                      | 107                      |
|                   |                                 | 0·7 0·5                  | 0·8 0·6                  | 0·6 0·5                  |
|                   |                                 | 117                      | 097                      | 117                      |
|                   |                                 | 1·9 1·1                  | 2·5 1·5                  | 2·5 1·5                  |
|                   |                                 | 116                      | 102                      | 122                      |
|                   |                                 | 2·6 1·5                  | 3·0 1·6                  | 3·4 1·9                  |
|                   |                                 | 120                      | 099                      | 114                      |
|                   |                                 | 2·5 1·6                  | 3·1 2·0                  | 3·4 1·9                  |
|                   |                                 | 126                      | 094                      | 105                      |
|                   |                                 | 1·9 1·2                  | 2·5 1·8                  | 3·0 1·7                  |
|                   |                                 | 137                      | 106                      | 105                      |
|                   |                                 | 1·1 0·8                  | 1·6 1·2                  | 2·4 1·4                  |

5614-18 (A) Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

| Hours             | Geographical Position           | A                         | B                         |
|-------------------|---------------------------------|---------------------------|---------------------------|
|                   |                                 | 53°38'·22 N<br>0°10'·65 W | 53°41'·35 N<br>0°13'·83 W |
| Before High Water | Directions of streams (degrees) | 132                       | 163                       |
| High Water        | Rates at spring tides (knots)   | 2·6 0·8                   | 3·3 1·0                   |
| After High Water  | Rates at neap tides (knots)     | 0·2 0·2                   | 1·1 0·2                   |
|                   |                                 | 239                       | 175                       |
|                   |                                 | 0·2 0·2                   | 1·1 0·2                   |
|                   |                                 | 303                       | 355                       |
|                   |                                 | 2·2 1·1                   | 2·3 1·2                   |
|                   |                                 | 305                       | 340                       |
|                   |                                 | 3·3 1·7                   | 3·0 1·5                   |
|                   |                                 | 314                       | 334                       |
|                   |                                 | 3·2 1·7                   | 3·1 1·8                   |
|                   |                                 | 315                       | 337                       |
|                   |                                 | 3·0 1·1                   | 3·3 1·3                   |
|                   |                                 | 319                       | 324                       |
|                   |                                 | 1·3 0·3                   | 1·4 0·5                   |
|                   |                                 | 122                       | 129                       |
|                   |                                 | 1·3 0·7                   | 1·1 0·6                   |
|                   |                                 | 133                       | 160                       |
|                   |                                 | 3·3 1·4                   | 2·5 1·5                   |
|                   |                                 | 129                       | 158                       |
|                   |                                 | 4·0 2·4                   | 3·1 2·1                   |
|                   |                                 | 132                       | 157                       |
|                   |                                 | 4·4 2·8                   | 3·9 2·4                   |
|                   |                                 | 126                       | 155                       |
|                   |                                 | 3·5 2·6                   | 4·3 2·5                   |
|                   |                                 | 132                       | 164                       |
|                   |                                 | 2·9 1·6                   | 3·8 1·9                   |

**5614-19 (A)** Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

| Hours             | Geographical Position           | 53°44'25 N<br>0°17'20 W | 53°43'85 N<br>0°20'92 W |
|-------------------|---------------------------------|-------------------------|-------------------------|
| Before High Water | Directions of streams (degrees) | 108                     | 063                     |
|                   |                                 | 097                     | 064                     |
|                   |                                 | 283                     | 241                     |
|                   |                                 | 286                     | 243                     |
|                   |                                 | 291                     | 245                     |
|                   |                                 | 286                     | 240                     |
| High Water        | Rates at spring tides (knots)   | 266                     | 239                     |
|                   |                                 | 112                     | 103                     |
|                   |                                 | 098                     | 068                     |
|                   |                                 | 101                     | 067                     |
|                   |                                 | 103                     | 066                     |
|                   |                                 | 106                     | 063                     |
| After High Water  | Rates at neap tides (knots)     | 108                     | 063                     |
|                   |                                 | 098                     | 068                     |
|                   |                                 | 101                     | 067                     |
|                   |                                 | 103                     | 066                     |
|                   |                                 | 106                     | 063                     |
|                   |                                 | 108                     | 063                     |

**5614-19 (C)** Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

| Hours             | Geographical Position           | 53°43'85 N<br>0°20'92 W |
|-------------------|---------------------------------|-------------------------|
| Before High Water | Directions of streams (degrees) | 063                     |
|                   |                                 | 064                     |
|                   |                                 | 241                     |
|                   |                                 | 243                     |
|                   |                                 | 245                     |
|                   |                                 | 240                     |
| High Water        | Rates at spring tides (knots)   | 239                     |
|                   |                                 | 103                     |
|                   |                                 | 068                     |
|                   |                                 | 067                     |
|                   |                                 | 066                     |
|                   |                                 | 063                     |
| After High Water  | Rates at neap tides (knots)     | 063                     |
|                   |                                 | 068                     |
|                   |                                 | 067                     |
|                   |                                 | 066                     |
|                   |                                 | 063                     |
|                   |                                 | 063                     |

**5614-21**

Tidal Streams referred to HW at IMMINGHAM

| Hours             | Geographical Position           | 53°59'9 N<br>0 17.3 E | 53°54'0 N<br>0 12.2 E | 53°50'0 N<br>0 26.5 E | 53°42'1 N<br>0 10.3 E | 53°37'0 N<br>0 26.4 E | 53°33'8 N<br>0 13.7 E |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Before High Water | Directions of streams (degrees) | 326                   | 300                   | 302                   | 320                   | 332                   | 040                   |
|                   |                                 | 302                   | 209                   | 274                   | 164                   | 227                   | 209                   |
|                   |                                 | 170                   | 186                   | 188                   | 159                   | 180                   | 209                   |
|                   |                                 | 154                   | 178                   | 162                   | 161                   | 175                   | 209                   |
|                   |                                 | 153                   | 170                   | 145                   | 159                   | 171                   | 209                   |
|                   |                                 | 151                   | 154                   | 139                   | 155                   | 166                   | 209                   |
| High Water        | Rates at spring tides (knots)   | 150                   | 136                   | 139                   | 110                   | 165                   | 209                   |
|                   |                                 | 139                   | 056                   | 113                   | 347                   | 310                   | 040                   |
|                   |                                 | 005                   | 008                   | 359                   | 343                   | 000                   | 040                   |
|                   |                                 | 348                   | 357                   | 347                   | 339                   | 004                   | 040                   |
|                   |                                 | 333                   | 352                   | 343                   | 341                   | 357                   | 040                   |
|                   |                                 | 333                   | 339                   | 333                   | 333                   | 350                   | 040                   |
| After High Water  | Rates at neap tides (knots)     | 329                   | 317                   | 316                   | 325                   | 341                   | 040                   |
|                   |                                 | 302                   | 209                   | 274                   | 164                   | 227                   | 209                   |
|                   |                                 | 170                   | 186                   | 188                   | 159                   | 180                   | 209                   |
|                   |                                 | 154                   | 178                   | 162                   | 161                   | 175                   | 209                   |
|                   |                                 | 153                   | 170                   | 145                   | 159                   | 171                   | 209                   |
|                   |                                 | 151                   | 154                   | 139                   | 155                   | 166                   | 209                   |

**5614-22 (A)**

Tidal Streams referred to HW at RIVER TEES ENTRANCE

| Hours             | Geographical Position           | 54°17'0 N<br>0 21.1 W | 54°09'8 N<br>0 00.9 E |
|-------------------|---------------------------------|-----------------------|-----------------------|
| Before High Water | Directions of streams (degrees) | 330                   | 326                   |
|                   |                                 | 323                   | 329                   |
|                   |                                 | 303                   | 323                   |
|                   |                                 | 275                   | 317                   |
|                   |                                 | 147                   | 154                   |
|                   |                                 | 147                   | 140                   |
| High Water        | Rates at spring tides (knots)   | 149                   | 148                   |
|                   |                                 | 151                   | 148                   |
|                   |                                 | 158                   | 143                   |
|                   |                                 | 352                   | 147                   |
|                   |                                 | 340                   | 327                   |
|                   |                                 | 326                   | 331                   |
| After High Water  | Rates at neap tides (knots)     | 331                   | 326                   |
|                   |                                 | 323                   | 329                   |
|                   |                                 | 303                   | 323                   |
|                   |                                 | 275                   | 317                   |
|                   |                                 | 147                   | 154                   |
|                   |                                 | 147                   | 140                   |

**5614-24**

Tidal Streams referred to HW at RIVER TEES ENTRANCE

| Hours             | Geographical Position           | 54°29'5 N<br>0 22.1 W | 54°27'0 N<br>0 06.1 W | 54°17'0 N<br>0 21.1 W |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|
| Before High Water | Directions of streams (degrees) | 307                   | 318                   | 330                   |
|                   |                                 | 308                   | 318                   | 323                   |
|                   |                                 | 310                   | 314                   | 303                   |
|                   |                                 | 313                   | 255                   | 275                   |
|                   |                                 | 128                   | 150                   | 147                   |
|                   |                                 | 132                   | 141                   | 147                   |
| High Water        | Rates at spring tides (knots)   | 131                   | 137                   | 149                   |
|                   |                                 | 129                   | 134                   | 151                   |
|                   |                                 | 123                   | 132                   | 158                   |
|                   |                                 | 122                   | 103                   | 352                   |
|                   |                                 | 314                   | 326                   | 340                   |
|                   |                                 | 312                   | 321                   | 326                   |
| After High Water  | Rates at neap tides (knots)     | 310                   | 319                   | 331                   |
|                   |                                 | 308                   | 318                   | 323                   |
|                   |                                 | 310                   | 314                   | 303                   |
|                   |                                 | 313                   | 255                   | 275                   |
|                   |                                 | 128                   | 150                   | 147                   |
|                   |                                 | 132                   | 141                   | 147                   |

**5614-25**

Tidal Streams referred to HW at DOVER

| Hours             | Geographical Position           | 54°09'0 N<br>4 51.0 E | 54°09'0 N<br>6 11.0 E | 54°02'1 N<br>2 53.8 E | 54°00'3 N<br>1 06.0 E | 53°45'0 N<br>5 58.0 E | 53°24'0 N<br>4 09.4 E | 53°20'0 N<br>2 44.0 E | 53°19'0 N<br>1 25.4 E | 52°33'9 N<br>4 09.3 E |
|-------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Before High Water | Directions of streams (degrees) | 063                   | 189                   | 094                   | 134                   | 085                   | 040                   | 078                   | 154                   | 019                   |
|                   |                                 | 076                   | 088                   | 096                   | 131                   | 085                   | 056                   | 120                   | 142                   | 069                   |
|                   |                                 | 082                   | 085                   | 104                   | 125                   | 083                   | 078                   | 147                   | 139                   | 193                   |
|                   |                                 | 086                   | 085                   | 115                   | 093                   | 080                   | 104                   | 161                   | 140                   | 200                   |
|                   |                                 | 096                   | 083                   | 110                   | 045                   | 080                   | 154                   | 173                   | 138                   | 205                   |
|                   |                                 | 154                   | 074                   | 163                   | 324                   | 082                   | 193                   | 194                   | 141                   | 206                   |
| High Water        | Rates at spring tides (knots)   | 238                   | 019                   | 273                   | 317                   | 000                   | 216                   | 233                   | 327                   | 204                   |
|                   |                                 | 259                   | 295                   | 285                   | 311                   | 268                   | 226                   | 282                   | 330                   | 201                   |
|                   |                                 | 261                   | 278                   | 280                   | 303                   | 268                   | 236                   | 323                   | 332                   | 068                   |
|                   |                                 | 262                   | 273                   | 288                   | 271                   | 260                   | 283                   | 347                   | 326                   | 030                   |
|                   |                                 | 268                   | 270                   | 298                   | 169                   | 265                   | 351                   | 001                   | 318                   | 022                   |
|                   |                                 | 318                   | 266                   | 340                   | 145                   | 265                   | 013                   | 017                   | 253                   | 019                   |
| After High Water  | Rates at neap tides (knots)     | 055                   | 251                   | 090                   | 137                   | 285                   | 031                   | 059                   | 164                   | 017                   |
|                   |                                 | 076                   | 088                   | 096                   | 131                   | 085                   | 056                   | 120                   | 142                   | 069                   |
|                   |                                 | 082                   | 085                   | 104                   | 125                   | 083                   | 078                   | 147                   | 139                   | 193                   |
|                   |                                 | 086                   | 085                   | 115                   | 093                   | 080                   | 104                   | 161                   | 140                   | 200                   |
|                   |                                 | 096                   | 083                   | 110                   | 045                   | 080                   | 154                   | 173                   | 138                   | 205                   |
|                   |                                 | 154                   | 074                   | 163                   | 324                   | 082                   | 193                   | 194                   | 141                   | 206                   |

**5614.25 continued**

| 52°29'0 N<br>2 43.0 E | 51°55'0 N<br>2 59.0 E |
|-----------------------|-----------------------|
| 053                   | 321                   |
| 180                   | 237                   |
| 190                   | 215                   |
| 192                   | 213                   |
| 195                   | 214                   |
| 195                   | 208                   |
| 191                   | 175                   |
| 077                   | 086                   |
| 027                   | 048                   |
| 018                   | 036                   |
| 014                   | 030                   |
| 009                   | 018                   |
| 005                   | 352                   |

**TIME & HEIGHT DIFFERENCES FOR PREDICTING THE TIDE AT SECONDARY PORTS**

| PLACE                            | Lat.<br>N.      | Long.<br>E.    | High Water                        |                                   |                                   |                                   | Low Water   |            |              |            | HEIGHT DIFFERENCES (IN METRES) |      |      |      |
|----------------------------------|-----------------|----------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------|------------|--------------|------------|--------------------------------|------|------|------|
|                                  |                 |                | Zone                              |                                   | U.T.(G.M.T.)                      |                                   | Zone        |            | U.T.(G.M.T.) |            | MHWS                           | MHWN | MLWN | MLWS |
| <b>LOWESTOFT</b> .....           | <b>52 28</b>    | <b>1 45</b>    | <b>0300</b><br>and<br><b>1500</b> | <b>0900</b><br>and<br><b>2100</b> | <b>0200</b><br>and<br><b>1400</b> | <b>0800</b><br>and<br><b>2200</b> | <b>2.4</b>  | <b>2.1</b> | <b>1.0</b>   | <b>0.5</b> |                                |      |      |      |
| Orford Ness .....                | 52 05           | 1 35           | +0135                             | +0135                             | +0135                             | +0125                             | +0.4        | +0.6       | -0.1         | 0.0        |                                |      |      |      |
| Aldeburgh .....                  | 52 09           | 1 36           | +0130                             | +0130                             | +0115                             | +0120                             | +0.3        | +0.2       | -0.1         | -0.2       |                                |      |      |      |
| Minsmere Sluice .....            | 52 14           | 1 38           | +0110                             | +0110                             | +0110                             | +0110                             | 0.0         | -0.1       | -0.2         | -0.2       |                                |      |      |      |
| Southwold .....                  | 52 19           | 1 40           | +0105                             | +0105                             | +0055                             | +0055                             | 0.0         | 0.0        | -0.1         | 0.0        |                                |      |      |      |
| <i>Great Yarmouth</i>            |                 |                |                                   |                                   |                                   |                                   |             |            |              |            |                                |      |      |      |
| GORLESTON-ON-SEA .....           | 52 34           | 1 44           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      | *    |
| Britannia Pier .....             | 52 36           | 1 45           | -0105                             | -0100                             | -0040                             | -0055                             | +0.1        | +0.1       | 0.0          | 0.0        |                                |      |      | *    |
| Caister-on-Sea .....             | 52 39           | 1 44           | -0120                             | -0120                             | -0100                             | -0100                             | 0.0         | -0.1       | 0.0          | 0.0        |                                |      |      | *    |
| Winterton-on-Sea .....           | 52 43           | 1 42           | -0225                             | -0215                             | -0135                             | -0135                             | +0.8        | +0.5       | +0.2         | +0.1       |                                |      |      | *    |
| <b>IMMINGHAM</b> .....           | <b>N. 53 38</b> | <b>W. 0 11</b> | <b>0100</b><br>and<br><b>1300</b> | <b>0700</b><br>and<br><b>1900</b> | <b>0100</b><br>and<br><b>1300</b> | <b>0700</b><br>and<br><b>1900</b> | <b>7.3</b>  | <b>5.8</b> | <b>2.6</b>   | <b>0.9</b> |                                |      |      |      |
| Cromer .....                     | N. 52 56        | E. 1 18        | +0044                             | +0032                             | +0108                             | +0059                             | -2.3        | -1.8       | -0.7         | 0.0        |                                |      |      |      |
| Blakeney Bar .....               | 52 59           | 0 59           | +0035                             | +0025                             | +0030                             | +0040                             | -1.6        | -1.3       | ⊙            | ⊙          |                                |      |      |      |
| Blakeney .....                   | 52 57           | 1 01           | +0115                             | +0055                             | ⊙                                 | ⊙                                 | -3.9        | -3.8       | ⊙            | ⊙          |                                |      |      |      |
| Wells Bar .....                  | 52 59           | 0 49           | +0020                             | +0020                             | +0020                             | +0020                             | -1.3        | -1.0       | ⊙            | ⊙          |                                |      |      |      |
| Wells .....                      | 52 58           | 0 51           | +0035                             | +0045                             | +0340                             | +0310                             | -3.8        | -3.8       | ‡            | ‡          |                                |      |      | *    |
| Burnham (Overy Staithe).....     | 52 58           | 0 45           | +0045                             | +0055                             | ⊙                                 | ⊙                                 | -5.0        | -4.9       | ⊙            | ⊙          |                                |      |      |      |
| <i>The Wash</i>                  |                 |                |                                   |                                   |                                   |                                   |             |            |              |            |                                |      |      |      |
| Hunstanton .....                 | 52 56           | 0 29           | +0010                             | +0020                             | +0105                             | +0025                             | +0.1        | -0.2       | -0.1         | 0.0        |                                |      |      |      |
| West Stones .....                | 52 50           | 0 21           | +0025                             | +0025                             | +0115                             | +0040                             | -0.3        | -0.4       | -0.3         | +0.2       |                                |      |      |      |
| King's Lynn .....                | 52 45           | 0 24           | +0030                             | +0030                             | +0305                             | +0140                             | -0.5        | -0.8       | -0.8         | +0.1†      |                                |      |      |      |
| Outer Westmark Knock .....       | 52 53           | 0 13           | +0010                             | +0015                             | +0040                             | +0020                             | -0.2        | -0.5       | -0.6         | -0.4       |                                |      |      |      |
| Wisbech Cut .....                | 52 48           | 0 13           | +0020                             | +0010                             | +0120                             | +0055                             | -0.3        | -0.7       | -0.4         | ⊙          |                                |      |      |      |
| Port Sutton Bridge .....         | 52 46           | 0 12           | +0030                             | +0020                             | +0130                             | +0105                             | -0.3        | -0.6       | -0.6         | +0.3       |                                |      |      |      |
| Wisbech .....                    | 52 40           | 0 09           | +0055                             | +0040                             | §                                 | §                                 | -0.2        | -0.6       | §            | §          |                                |      |      |      |
| Lawyer's Creek .....             | 52 53           | 0 05           | +0010                             | +0020                             | ⊙                                 | ⊙                                 | -0.3        | -0.6       | ⊙            | ⊙          |                                |      |      |      |
| Tab's Head .....                 | 52 56           | 0 05           | 0000                              | +0005                             | +0125                             | +0020                             | +0.2        | -0.2       | -0.2         | -0.2       |                                |      |      |      |
| <b>BOSTON</b> .....              | <b>N. 52 58</b> | <b>W. 0 01</b> | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| Skegness .....                   | N. 53 09        | E. 0 21        | +0010                             | +0015                             | +0030                             | +0020                             | -0.4        | -0.5       | -0.1         | 0.0        |                                |      |      |      |
| Inner Dowsing Light .....        | 53 19           | 0 35           | 0000                              | 0000                              | +0010                             | +0010                             | -0.9        | -0.7       | -0.1         | +0.3       |                                |      |      |      |
| <i>River Humber</i>              |                 |                |                                   |                                   |                                   |                                   |             |            |              |            |                                |      |      |      |
| SPURN HEAD .....                 | 53 35           | 0 07           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| Bull Sand Fort .....             | 53 34           | 0 04           | -0020                             | -0030                             | -0035                             | -0015                             | -0.4        | -0.3       | +0.1         | +0.2       |                                |      |      |      |
| GRIMSBY .....                    | N. 53 35        | W. 0 04        | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| HUMBER SEA TERMINAL .....        | 53 40           | 0 14           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| HULL (KING GEORGE DOCK).....     | 53 44           | 0 16           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| HULL (ALBERT DOCK) .....         | 53 44           | 0 21           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| Humber Bridge.....               | 53 43           | 0 27           | +0027                             | +0022                             | +0049                             | +0039                             | -0.1        | -0.4       | -0.7         | -0.6       |                                |      |      |      |
| <i>River Trent</i>               |                 |                |                                   |                                   |                                   |                                   |             |            |              |            |                                |      |      |      |
| Burton Stather .....             | 53 39           | 0 42           | +0105                             | +0050                             | +0240                             | +0205                             | -2.0        | -2.7       | -2.2         | -1.1       |                                |      |      | *    |
| FLIXBOROUGH WHARF .....          | 53 37           | 0 42           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      |      |
| Keadby .....                     | 53 36           | 0 44           | +0130                             | +0115                             | +0320                             | +0235                             | -2.8        | -3.3       | -2.3         | -0.9       |                                |      |      | *    |
| Owston Ferry .....               | 53 29           | 0 46           | +0155                             | +0145                             | §                                 | §                                 | -3.5        | -3.9       | §            | §          |                                |      |      |      |
| <i>River Ouse</i>                |                 |                |                                   |                                   |                                   |                                   |             |            |              |            |                                |      |      |      |
| Blacktoft .....                  | 53 42           | 0 43           | +0100                             | +0055                             | +0325                             | +0255                             | -1.6        | -1.8       | -2.2         | -1.1       |                                |      |      | *    |
| GOOLE .....                      | 53 42           | 0 52           | STANDARD PORT                     |                                   |                                   |                                   | See Table V |            |              |            |                                |      |      | *    |
| <b>RIVER TEES ENTRANCE</b> ..... | <b>N. 54 38</b> | <b>W. 1 09</b> | <b>0000</b><br>and<br><b>1200</b> | <b>0600</b><br>and<br><b>1800</b> | <b>0000</b><br>and<br><b>1200</b> | <b>0600</b><br>and<br><b>1800</b> | <b>5.5</b>  | <b>4.3</b> | <b>2.0</b>   | <b>0.9</b> |                                |      |      |      |
| Bridlington .....                | 54 05           | 0 11           | +0100                             | +0050                             | +0055                             | +0050                             | +0.6        | +0.4       | +0.3         | +0.2       |                                |      |      |      |
| Filey Bay .....                  | 54 13           | 0 16           | +0042                             | +0042                             | +0047                             | +0034                             | +0.3        | +0.6       | +0.4         | +0.1       |                                |      |      |      |
| Scarborough .....                | 54 17           | 0 23           | +0040                             | +0040                             | +0030                             | +0030                             | +0.2        | +0.3       | +0.3         | 0.0        |                                |      |      |      |
| Whitby .....                     | 54 29           | 0 37           | +0020                             | +0020                             | +0018                             | +0017                             | +0.1        | +0.1       | +0.2         | +0.1       |                                |      |      |      |

⊙ No Data

† The tide does not normally fall below this level

§ Dries out except for river water

‡ The tide does not normally fall below Chart Datum

\* See notes

| TABLE V                 |      |      |      |      |
|-------------------------|------|------|------|------|
| STANDARD PORT           | MHWS | MHWN | MLWN | MLWS |
| GORLESTON-ON-SEA        | 2.4  | 2.1  | 1.0  | 0.5  |
| BOSTON                  | 6.8  | 4.8  | 1.7  | 0.4  |
| SPURN HEAD              | 6.9  | 5.5  | 2.7  | 1.2  |
| GRIMSBY                 | 7.0  | 5.6  | 2.7  | 1.3  |
| HUMBER SEA TERMINAL     | 7.2  | 5.7  | 2.6  | 1.1  |
| HULL (KING GEORGE DOCK) | 7.6  | 6.0  | 2.5  | 0.7  |
| HULL (ALBERT DOCK)      | 7.6  | 5.9  | 2.5  | 0.7  |
| FLIXBOROUGH WHARF       | 5.2  | 3.0  | 0.4  | 0.0  |
| GOOLE                   | 5.7  | 3.7  | 0.7  | 0.3  |

**\*TIDAL NOTES**

Between Winterton-on-Sea and Great Yarmouth the rise of the tide occurs mainly during the 3½ hours following low water. At Winterton-on-Sea the level is usually within 0.3m of the predicted high water height from 4 hours before high water at Lowestoft until 1 hour before high water at Lowestoft. At Caister-on-Sea, where double high waters sometimes occur, and at Great Yarmouth the level is usually within 0.3m of the predicted high water height from 3 hours before high water at Lowestoft until high water at Lowestoft.

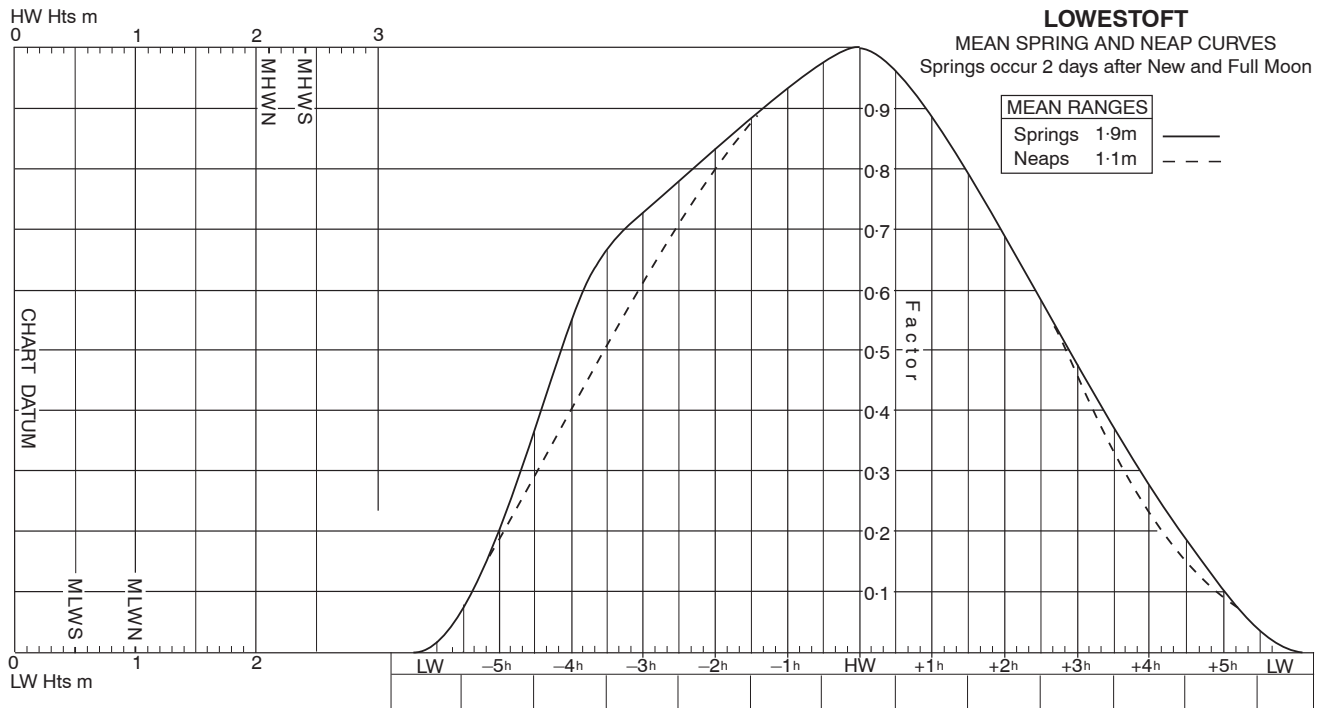
Low water time differences at Wells are for the end of a low water stand which lasts about 4 hours at springs and about 5 hours at neaps.

At Burton Stather, normal river level is about 0.1m below chart datum.

At Keadby, normal river level is between 0.1m and 0.2m below chart datum. The tide is normally at or just below chart datum for ½ to 1½ hours; low water time differences are for the beginning of the rise.

At Blacktoft and Goole the amount of fresh water coming down the rivers has little effect on the heights of high water. The levels for low water are given for a low rate of river flow. High rates of river flow can increase the level of low water by as much as 0.3m at Blacktoft and 0.6m at Goole.

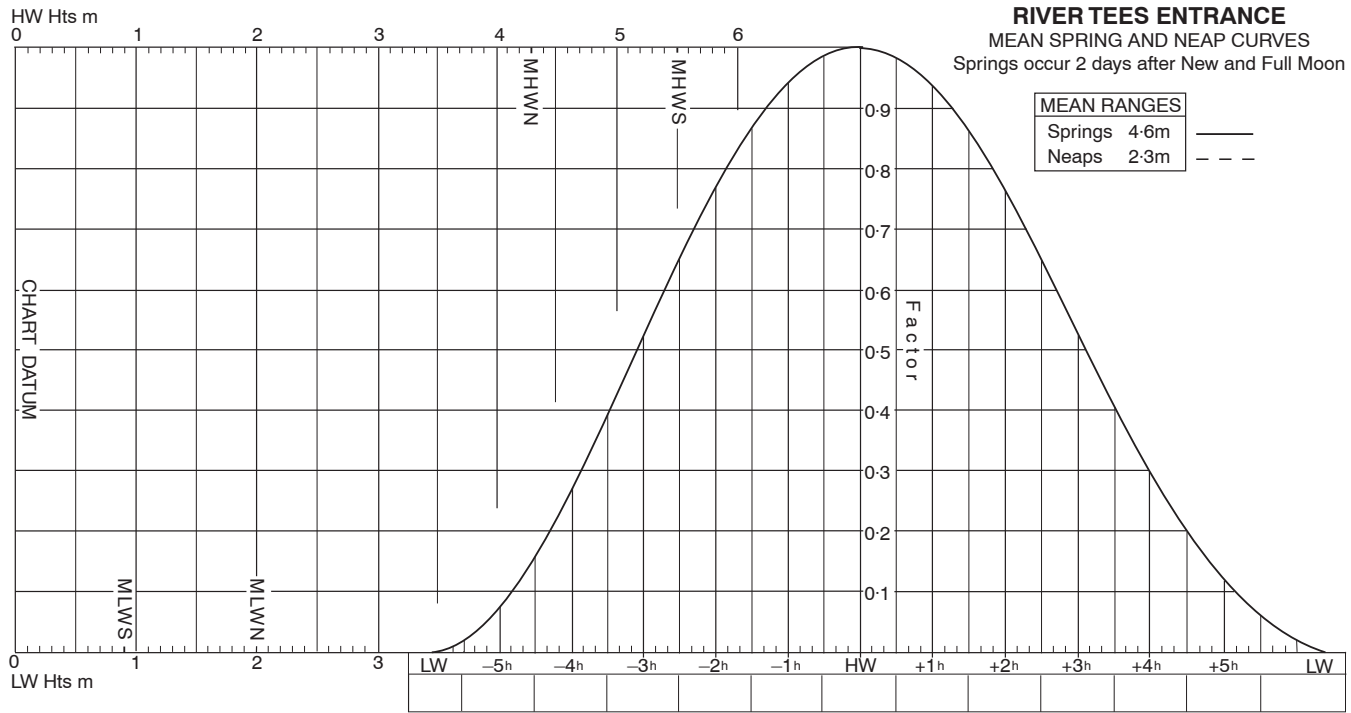
**Tidal Curve Diagrams**



**RIVER TEES ENTRANCE**

MEAN SPRING AND NEAP CURVES

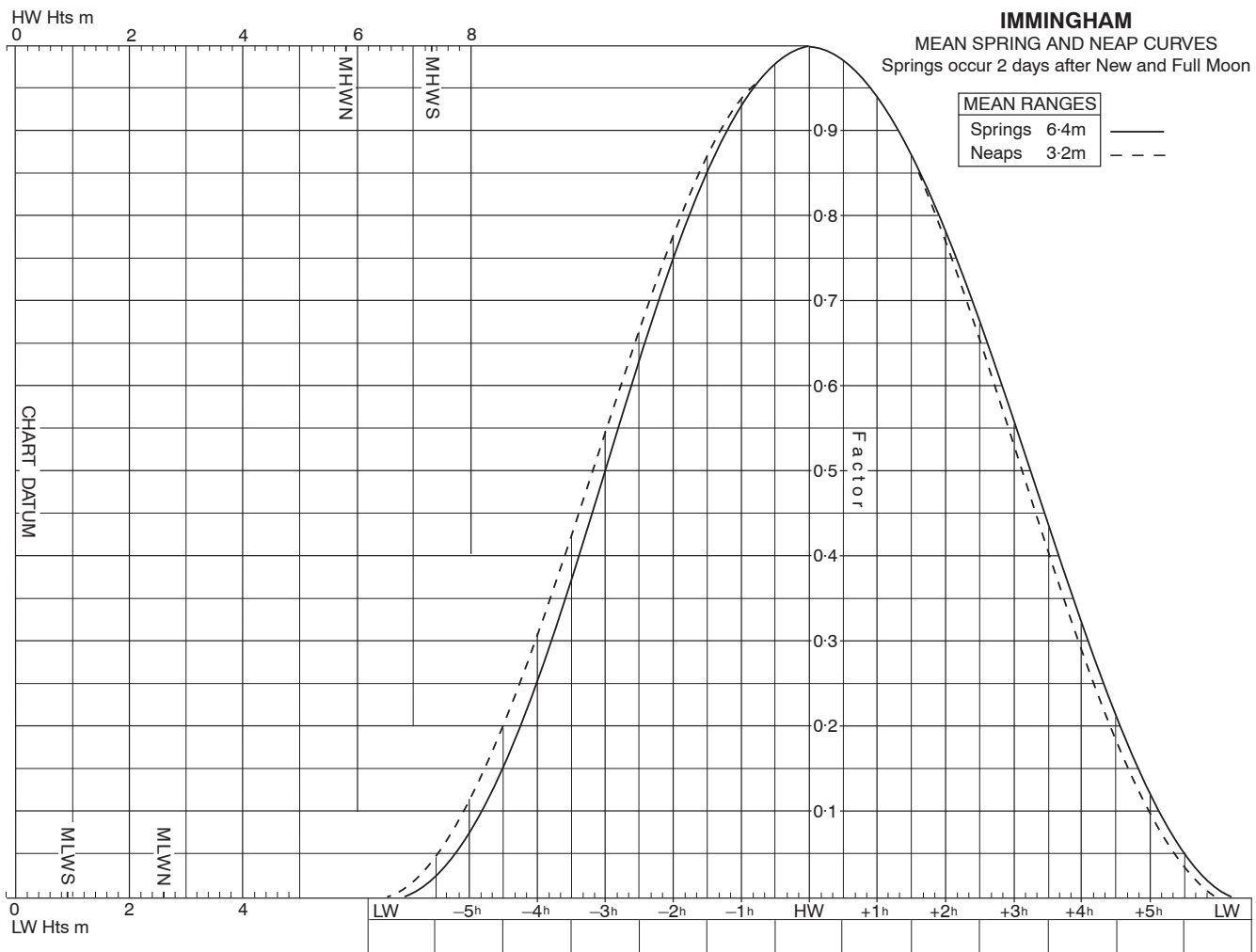
Springs occur 2 days after New and Full Moon

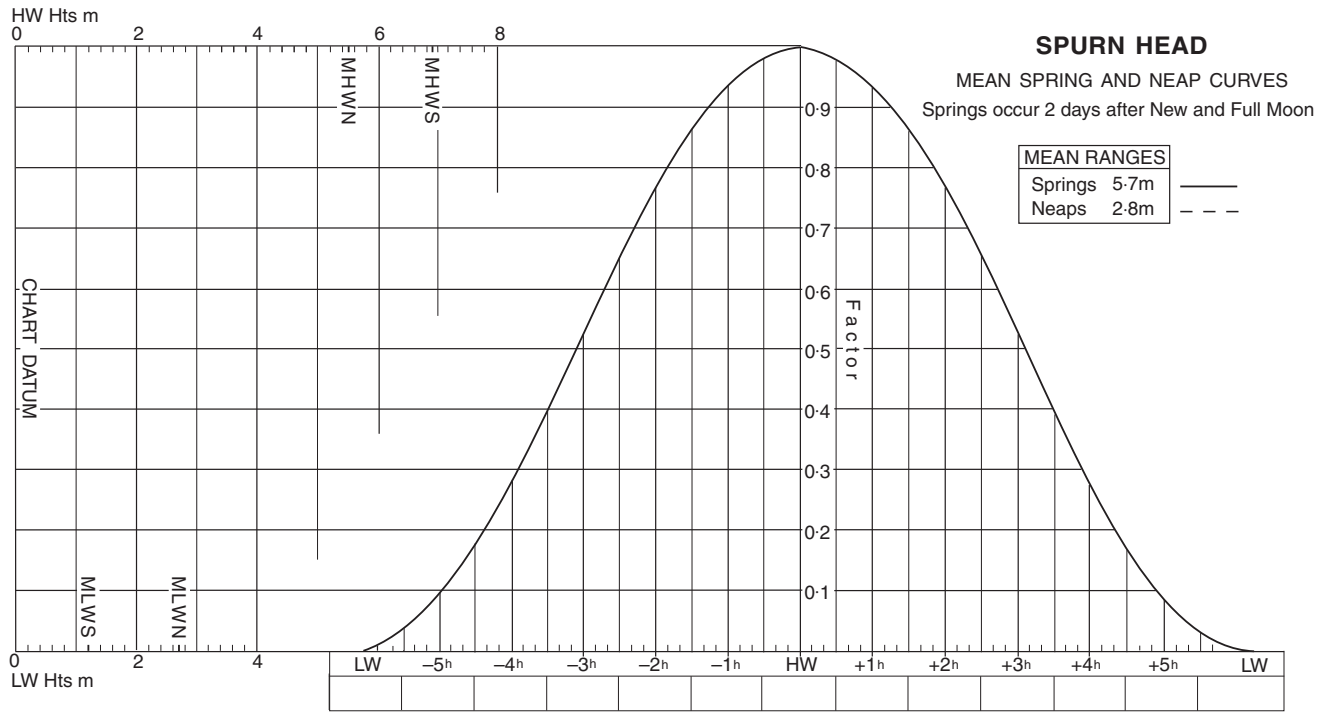


**IMMINGHAM**

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon





For guidance on the use of Tidal Curve Diagrams see ADMIRALTY Tides Tables NP201A and NP201B