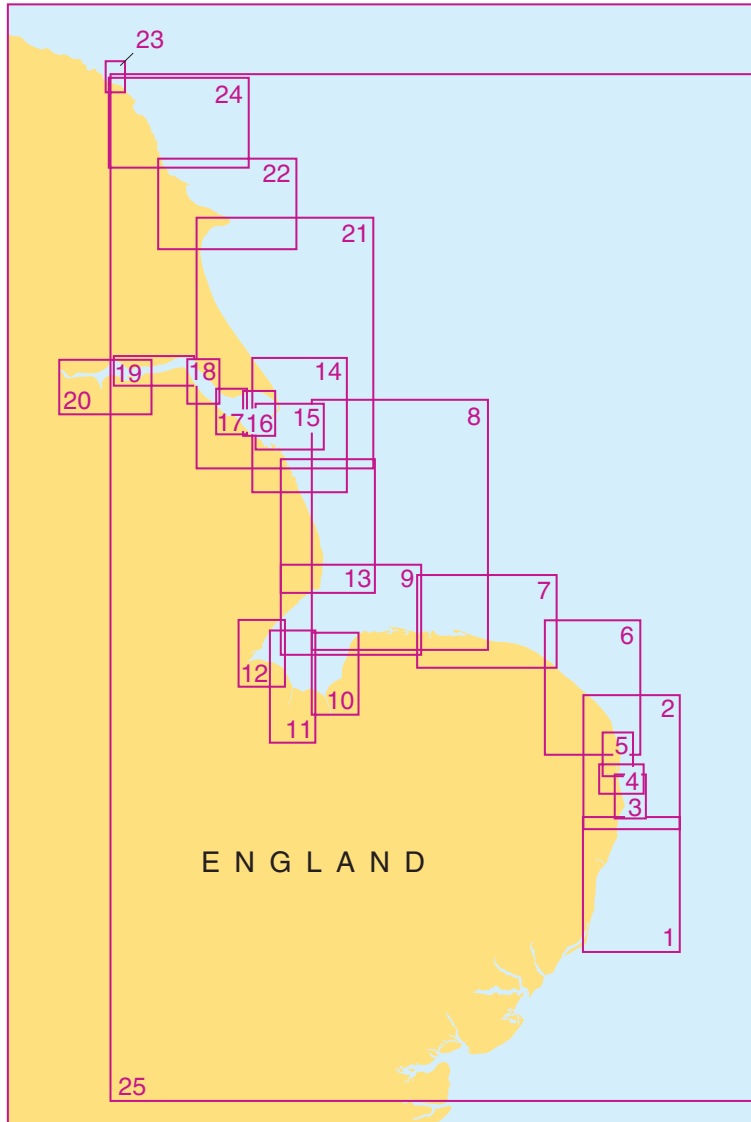




# East Coast - Orford Ness to Whitby



5614	Chart Title	Natural Scale 1:
1A	Orford Ness to Benacre Ness	75,000
1B	Orford Ness	50,000
2	Lowestoft to Winterton Ness	75,000
3	Approaches to Lowestoft	25,000
4A	Approaches to Great Yarmouth	25,000
4B	Great Yarmouth Outer Harbour	7,500
5A	Northern Approaches to Great Yarmouth	25,000
5B	Great Yarmouth Haven	7,500

5614	Chart Title	Natural Scale 1:
6A	Caister-on-Sea to Mundesley	75,000
6B	Southwold Harbour	7,500
7A	Cromer to Wells-next-the-Sea	75,000
7B	Wells-next-the-Sea	30,000
8	Outer Approaches to The Wash	150,000
9	Approaches to The Wash	75,000
10A	The Wash - Eastern Part	37,500
10B	Continuation of Lynn Cut	37,500
10C	King's Lynn	10,000
11A	The Wash - Central Part	37,500
11B	Continuation of the River Nene	50,000
11C	Continuation of the River Nene to Wisbech	50,000
12A	The Wash - Western Part	37,500
12B	Approaches to Boston	20,000
12C	Boston	10,000
13	Gibraltar Point to Saltfleet	75,000
14	Approaches to the River Humber	75,000
15	River Humber Entrance	37,500
16	Spurn Head to Grimsby Middle	25,000
17A	Approaches to Grimsby	25,000
17B	Grimsby	10,000
18A	Immingham to Saltend	25,000
18B	Goole	5,000
19A	Kingston Upon Hull to Humber Bridge	25,000
19B	Humber Bridge to Whitton Ness	50,000
19C	Hull Docks - Western Part	10,000
20A	Lowestoft Harbour	6,250
20B	Whitton Ness to Goole and Mere Dyke	50,000
20C	Continuation to Keadby	50,000
21	Spurn Head to Flamborough Head	150,000
22A	Bridlington to Scarborough	75,000
22B	Bridlington Harbour	5,000
23A	Approaches to Whitby	25,000
23B	Whitby Harbour	7,500
23C	Scarborough Bay	10,000
23D	Scarborough Harbour	5,000
24	Scarborough to Whitby	75,000
25	Southern North Sea	750,000

## Notes

### 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.


### OVERHEAD CABLES

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

### CHECK SURVEYS

Depths in the areas indicated are taken from single beam check line surveys with lines of 300 to 400 metres apart. Less water than charted will exist over the sandbanks.

### OMISSION OF DETAIL

Within the limit marked  and the coastline, this chart should only be used for planning purposes as features such as depths, platforms, wrecks, pipelines, minor aids to navigation and cables have been omitted. Larger scale ADMIRALTY charts are available for mariners intending to navigate in this area.

**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)

### CHANGING DEPTHS

Depths in the River Humber are subject to frequent change; the buoyage and other aids to navigation are adjusted accordingly. The Harbour Master, Humber, should be consulted for the latest information.

### GAS FIELD DECOMMISSIONING

Production platforms and associated structure in the areas indicated are currently being decommissioned. During the works, aids to navigation may be unreliable and certain features may not be as shown. Consult local notices to mariners issued by the gas operator for details of decommissioning progress.

### WRECKS AND OBSTRUCTIONS

In areas covered by larger scale charts some less significant wrecks and obstructions have been omitted for reasons of clarity.

### MARINE FARMS

Marine farms exist within the area of this chart. They may not all be shown individually and their positions may change frequently. Marine farms may be marked by lit or unlit buoys or beacons. Mariners are advised to avoid these structures and their associated moorings.

### 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
- Lowestoft Local Port Service

### HISTORIC WRECKS

The sites of historic wrecks are protected from unauthorised interference.

### SUBMARINE CABLES AND PIPELINES

Mariners should not anchor, trawl or engage in seabed operations in the vicinity of submarine cables and pipelines. Submarine cables support national infrastructure; damage to them may affect critical services and can result in serious consequences, as well as creating a potential hazard to mariners. Willful or neglectful damage to a cable may result in legal action. 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.

### HUMBER DEEP WATER ANCHORAGE

(53°37'N 0°25'E)

Humber Deep Water Anchorage is recommended for large vessels bound for the Humber. Good holding ground exists in the charted designated anchor berths A to N. Mariners are advised to keep their vessels in a state of readiness and be prepared to get underway at short notice.

### WETREP

Tankers of more than 600 dwt carrying heavy crude oil, heavy fuel oil or bitumen and tar and their emulsions are required to participate in the Western European Tanker Reporting System (WETREP). See ADMIRALTY List of Radio Signals for further details.

## 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 (MRCC)

Tel. +44 (0) 1262 672317

MMSI: 002320007

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

#### LONDON (MRSC)

Tel. +44 (0) 208 3127380

MMSI: 002320063

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

## 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 1 59-5 E	52°24'5 N 1 49-1 E	52°20'0N 1 59-8 E	52°18'2 N 1 41-9 E	52°15'4 N 1 48-8 E	52°12'7 N 1 38-3 E	52°04'9 N 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		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°04'9 N 1 38-3 E	52°03'1 N 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 1 52-9 E	52°43'4 N 1 46-8 E	52°42'0N 2 00-0 E	52°41'0N 1 54-9 E	52°38'8 N 1 49-0 E	52°38'0N 1 54-4 E	52°35'0N 1 45-9 E	52°34'1 N 1 59-9 E	52°31'6 N 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 1 49-9 E	52°27'0N 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 1 51-29E	52°28'03N 1 49-89E	52°27'93N 1 46-79E				
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°35'03N 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°41'03N 1 45-39 E	52°35'03N 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°59'0N 1 34-9 E	52°52'5N 1 49-9 E	52°50'0N 1 47-9 E	52°43'4N 1 46-8 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
		327 2.6 1.5	327 2.8 1.4	321 2.2 1.3	334 3.1 1.6
		327 2.7 1.6	327 2.7 1.4	321 2.7 1.5	330 3.0 1.6
		327 1.9 1.1	326 2.1 1.1	321 2.5 1.4	327 2.4 1.2
		327 0.7 0.5	324 0.9 0.5	321 1.5 0.8	329 1.2 0.6
		147 0.6 0.3	142 0.8 0.4	321 0.2 0.1	155 0.9 0.5
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
		147 2.4 1.4	148 2.8 1.4	141 2.4 1.3	151 3.0 1.6
		147 2.4 1.5	146 2.6 1.3	141 2.5 1.5	149 2.9 1.5
		147 1.9 1.2	146 1.9 1.0	141 2.1 1.3	149 2.3 1.2
		147 1.1 0.6	153 0.8 0.4	141 1.4 0.8	151 1.1 0.6
		327 0.1 0.1	320 0.5 0.3	141 0.4 0.2	341 0.2 0.1
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

Tidal Streams referred to HW at DOVER

Hours	Geographical Position	52°38'8N 1 49-0 E
Before High Water	Directions of streams (degrees)	175 1.1 0.6
		173 3.3 1.8
		171 3.1 1.7
		170 2.6 1.4
		172 1.9 1.0
		171 0.7 0.4
High Water	Rates at spring tides (knots)	356 0.8 0.4
		355 2.5 1.3
		356 3.0 1.6
		356 2.9 1.6
		353 2.3 1.2
		350 1.2 0.7
After High Water	Rates at neap tides (knots)	196 0.2 0.1

**5614\_6(B)** Tidal Streams referred to HW at DOVER

Hours	Geographical Position	52°18'88N 1 40-34 E
Before High Water	Directions of streams (degrees)	305 1.1 0.7
		305 1.0 0.7
		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°01'02N 0 58-39 E	53°05'42N 1 13-09 E	53°00'02N 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°37'0N 0 26-4 E	53°35'3N 0 39-7 E	53°33'7N 0 59-2 E	53°27'0N 1 04-9 E	53°19'0N 0 33-9 E	53°14'5N 0 56-9 E	53°09'7N 0 29-9 E	53°08'3N 0 54-4 E	53°08'0N 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°01'2N 0 25-8 E	53°01'0N 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 0 29-89 E	53°08'42N 0 23-39 E	53°08'02N 0 39-99 E	53°03'12N 0 20-09 E	53°03'12N 0 23-89 E	53°02'32N 0 30-99 E	53°02'22N 0 33-99 E	53°01'22N 0 25-79 E								
Before High Water	Directions of streams (degrees)	352	0-4 0-2	000	0-3 0-1	315	1-6 0-8	313	0-4 0-2	000	0-3 0-1	013	0-5 0-2	302	1-5 0-7	025	0-5 0-3
		326	0-2 0-1	180	0-5 0-2	303	1-4 0-7	230	1-0 0-5	220	0-4 0-2	200	0-0 0-0	302	1-3 0-6	330	0-1 0-1
		205	0-9 0-5	180	1-3 0-7	266	0-9 0-5	216	1-9 1-0	209	1-0 0-5	200	0-7 0-3	283	0-8 0-4	223	0-5 0-3
		199	2-1 1-1	180	1-9 1-0	205	1-0 0-5	213	2-4 1-2	206	1-8 0-9	205	1-4 0-7	225	0-6 0-3	213	1-5 0-8
		195	2-1 1-1	180	2-0 1-0	176	1-1 0-6	213	2-4 1-2	205	2-0 1-0	211	2-4 1-2	182	0-7 0-4	212	2-2 1-2
		188	1-3 0-7	180	1-5 0-7	159	1-1 0-6	214	1-7 0-9	205	1-6 0-8	210	2-2 1-1	155	0-8 0-4	212	1-9 1-0
High Water	Directions of streams (degrees)	171	0-7 0-4	180	0-9 0-4	137	1-2 0-6	249	0-4 0-2	198	0-5 0-3	203	1-1 0-5	128	1-0 0-5	212	1-0 0-5
		050	0-6 0-3	000	0-3 0-2	112	1-3 0-7	035	1-0 0-5	036	0-7 0-3	064	0-3 0-2	108	1-3 0-6	182	0-1 0-1
		021	0-9 0-5	000	1-3 0-7	095	1-1 0-6	047	2-1 1-1	029	1-4 0-7	034	1-4 0-7	096	1-2 0-6	032	0-8 0-4
		016	1-4 0-7	000	2-0 1-0	058	0-8 0-4	049	2-6 1-3	029	1-8 0-9	031	2-0 1-0	077	0-8 0-4	035	1-7 0-9
		012	1-9 1-0	000	1-8 0-9	007	0-9 0-5	042	2-2 1-1	025	1-7 0-9	026	1-9 1-0	018	0-5 0-2	038	2-0 1-0
		007	1-6 0-8	000	1-2 0-6	339	1-2 0-6	032	1-5 0-8	020	1-2 0-6	018	1-4 0-7	322	0-8 0-4	037	1-5 0-8
After High Water	Directions of streams (degrees)	000	0-6 0-3	000	0-5 0-3	323	1-5 0-8	000	0-6 0-3	015	0-5 0-3	015	0-8 0-4	306	1-3 0-6	031	0-8 0-4

5614\_9 continued

Hours	Geographical Position	53°00'82N 0 17-59 E	52°57'22N 0 28-09 E		
Before High Water	Directions of streams (degrees)	025	0-4 0-2	211	0-5 0-2
		211	0-7 0-3	206	0-8 0-4
		208	1-8 0-9	200	1-1 0-6
		208	2-4 1-2	197	1-4 0-7
		208	2-4 1-2	195	1-6 0-8
		208	1-7 0-8	203	0-9 0-5
High Water	Directions of streams (degrees)	213	0-5 0-2	013	0-3 0-2
		027	0-7 0-4	025	1-4 0-7
		029	1-6 0-8	022	1-9 0-9
		030	2-1 1-0	020	1-7 0-8
		030	2-2 1-1	017	0-9 0-5
		030	1-8 0-9	007	0-3 0-2
After High Water	Directions of streams (degrees)	030	0-9 0-4	225	0-2 0-1

5614\_10(A)

Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	52°53'7N 0 24-3E	52°57'2N 0 28-1E		
Before High Water	Directions of streams (degrees)	358	0-3 0-2	211	0-5 0-2
		203	0-1 0-1	206	0-8 0-4
		195	0-6 0-3	200	1-1 0-6
		192	1-2 0-6	197	1-4 0-7
		192	1-8 0-9	195	1-6 0-8
		192	1-5 0-7	203	0-9 0-5
High Water	Directions of streams (degrees)	188	0-6 0-3	013	0-3 0-2
		021	0-3 0-2	025	1-4 0-7
		016	1-1 0-5	022	1-9 0-9
		014	1-5 0-7	020	1-7 0-8
		010	1-5 0-7	017	0-9 0-5
		007	1-0 0-5	007	0-3 0-2
After High Water	Directions of streams (degrees)	003	0-5 0-3	225	0-2 0-1

5614\_11(A)

Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	52°57'2N 0 07-6E	52°57'6N 0 08-9E	52°52'6N 0 15-5E			
Before High Water	Directions of streams (degrees)	053	0-9 0-4	057	0-3 0-2	350	1-2 0-6
		321	0-1 0-0	138	0-1 0-0	347	0-3 0-1
		235	1-0 0-5	215	0-3 0-1	176	0-8 0-4
		233	1-8 0-9	221	1-0 0-5	175	1-8 0-9
		233	2-0 1-0	222	1-8 0-9	175	2-3 1-1
		233	1-7 0-9	237	1-2 0-6	175	2-0 1-0
High Water	Directions of streams (degrees)	235	0-9 0-5	240	0-5 0-2	175	1-1 0-6
		321	0-1 0-0	048	0-3 0-1	162	0-1 0-1
		053	0-9 0-5	048	0-8 0-4	357	0-7 0-4
		055	1-6 0-8	048	1-0 0-5	356	1-5 0-8
		056	1-9 0-9	048	1-0 0-5	355	2-0 1-0
		055	1-7 0-8	041	0-8 0-4	354	1-9 0-9
After High Water	Directions of streams (degrees)	054	1-2 0-6	048	0-5 0-2	352	1-4 0-7

5614\_12(A)

Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	52°57'2N 0 07-6E	52°57'6N 0 08-9E		
Before High Water	Directions of streams (degrees)	053	0-9 0-4	057	0-3 0-2
		321	0-1 0-0	138	0-1 0-0
		235	1-0 0-5	215	0-3 0-1
		233	1-8 0-9	221	1-0 0-5
		233	2-0 1-0	222	1-8 0-9
		233	1-7 0-9	237	1-2 0-6
High Water	Directions of streams (degrees)	235	0-9 0-5	240	0-5 0-2
		321	0-1 0-0	048	0-3 0-1
		053	0-9 0-5	048	0-8 0-4
		055	1-6 0-8	048	1-0 0-5
		056	1-9 0-9	048	1-0 0-5
		055	1-7 0-8	041	0-8 0-4
After High Water	Directions of streams (degrees)	054	1-2 0-6	048	0-5 0-2

5614\_12(B)

Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	52°57'2N 0 07-6E	
Before High Water	Directions of streams (degrees)	053	0-9 0-4
		321	0-1 0-0
		235	1-0 0-5
		233	1-8 0-9
		233	2-0 1-0
		233	1-7 0-9
High Water	Directions of streams (degrees)	235	0-9 0-5
		321	0-1 0-0
		053	0-9 0-5
		055	1-6 0-8
		056	1-9 0-9
		055	1-7 0-8
After High Water	Directions of streams (degrees)	054	1-2 0-6

5614\_13

Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	53°19'02N 0 33-89 E	53°09'72N 0 29-89 E	53°08'42N 0 23-39 E			
Before High Water	Directions of streams (degrees)	358	1-1 0-6	352	0-4 0-2	000	0-3 0-1
		328	0-5 0-2	326	0-2 0-1	180	0-5 0-2
		216	0-8 0-4	205	0-9 0-5	180	1-3 0-7
		191	1-5 0-8	199	2-1 1-1	180	1-9 1-0
		185	1-8 0-9	195	2-1 1-1	180	2-0 1-0
		185	1-6 0-8	188	1-3 0-7	180	1-5 0-7
High Water	Directions of streams (degrees)	177	1-1 0-6	171	0-7 0-4	180	0-9 0-4
		135	0-6 0-3	050	0-6 0-3	000	0-3 0-2
		032	0-7 0-3	021	0-9 0-5	000	1-3 0-7
		013	1-2 0-6	016	1-4 0-7	000	2-0 1-0
		009	1-5 0-8	012	1-9 1-0	000	1-8 0-9
		006	1-5 0-8	007	1-6 0-8	000	1-2 0-6
After High Water	Directions of streams (degrees)	001	1-2 0-7	000	0-6 0-3	000	0-5 0-3

5614\_14

Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	A 53°42'11 N 0 10'3 E	B 53°37'5 N 0 19'9 E	C 53°37'0 N 0 26'4 E	D 53°33'8 N 0 13'7 E	E 53°30'7 N 0 17'7 E					
Before High Water	Directions of streams (degrees)	320	0.4 0.2	340	0.5 0.3	332	0.8 0.5	040	0.7 0.4	347	0.6 0.3
		164	1.3 0.6	175	0.5 0.2	227	0.3 0.2	209	0.6 0.2	207	0.3 0.1
		159	2.4 1.2	175	1.9 0.9	180	1.6 0.9	209	2.0 0.8	184	1.3 0.7
		161	2.5 1.2	176	2.3 1.1	175	2.3 1.3	209	2.6 1.3	185	2.0 1.0
		159	2.5 1.2	174	2.0 1.0	171	2.4 1.4	209	2.3 1.4	189	1.8 0.9
		155	1.4 0.7	170	1.3 0.7	166	1.9 1.1	209	1.6 1.1	189	1.2 0.6
High Water	Rates at spring tides (knots)	110	0.1 0.1	153	0.5 0.3	165	0.9 0.5	209	0.6 0.4	180	0.5 0.2
		347	1.1 0.6	013	0.4 0.2	310	0.1 0.0	040	0.6 0.4	013	0.4 0.2
		343	2.2 1.1	357	1.4 0.7	000	1.0 0.6	040	1.8 1.2	012	1.3 0.7
		339	2.6 1.3	355	2.1 1.1	004	1.9 1.1	040	3.2 1.6	013	1.6 0.8
		341	2.1 1.0	351	2.1 1.1	357	2.1 1.2	040	3.4 1.6	009	1.7 0.9
		333	1.5 0.7	349	1.6 0.8	350	1.9 1.1	040	2.7 1.3	003	1.5 0.7
After High Water	Rates at neap tides (knots)	325	0.7 0.3	342	0.8 0.4	341	1.2 0.7	040	1.4 0.8	352	0.8 0.4

5614\_15

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

Hours	Geographical Position	A 53°30'72 N 0 17'69 E	B 53°33'82 N 0 13'69 E	C 53°33'32 N 0 07'50 E	D 53°32'62 N 0 06'10 E	E 53°33'92 N 0 06'10 E	F 53°33'82 N 0 05'60 E	G 53°32'72 N 0 04'40 E							
Before High Water	Directions of streams (degrees)	347	0.6 0.3	040	0.7 0.4	119	1.5 0.9	180	0.1 0.1	130	1.3 0.9	126	0.9 0.5	168	0.2 0.1
		207	0.3 0.1	209	0.6 0.2	239	1.4 0.6	261	1.5 0.9	331	1.8 0.7	327	0.8 0.3	296	0.6 0.3
		184	1.3 0.7	209	2.0 0.8	283	3.1 1.4	275	2.3 1.3	323	2.6 1.1	320	2.1 1.0	306	1.8 0.9
		185	2.0 1.0	209	2.6 1.3	281	3.8 1.8	285	3.1 1.8	310	3.8 1.7	317	2.8 1.4	301	2.2 1.1
		189	1.8 0.9	209	2.3 1.4	273	3.4 1.6	289	3.1 1.7	304	3.4 1.5	310	2.9 1.4	302	2.3 1.1
		189	1.2 0.6	209	1.6 1.1	284	2.9 1.0	298	2.4 1.4	271	1.9 0.8	308	2.3 1.1	301	1.8 0.9
High Water	Rates at spring tides (knots)	180	0.5 0.2	209	0.6 0.4	318	0.9 0.4	320	1.0 0.6	106	0.3 0.2	312	0.7 0.3	295	0.7 0.3
		013	0.4 0.2	040	0.6 0.4	051	1.6 0.9	069	1.2 0.5	135	2.3 1.4	120	1.1 0.7	087	1.0 0.5
		012	1.3 0.7	040	1.8 1.2	076	2.7 1.5	093	2.7 1.3	122	3.3 1.9	128	2.4 1.3	100	2.5 1.2
		013	1.6 0.8	040	3.2 1.6	106	4.1 2.3	112	3.0 1.4	119	4.3 2.5	132	3.1 1.7	113	2.5 1.2
		009	1.7 0.9	040	3.4 1.6	109	4.0 2.2	116	2.2 1.0	122	3.7 2.1	133	2.9 1.6	107	1.7 0.8
		003	1.5 0.7	040	2.7 1.3	109	2.8 1.6	116	1.3 0.6	125	2.6 1.6	130	2.1 1.2	123	1.3 0.6
After High Water	Rates at neap tides (knots)	352	0.8 0.4	040	1.4 0.8	112	1.8 1.1	123	0.4 0.1	126	1.8 1.2	126	1.3 0.8	157	0.6 0.2

5614\_16

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

Hours	Geographical Position	A 53°33'32 N 0 07'50 E	B 53°32'62 N 0 06'10 E	C 53°33'92 N 0 06'10 E	D 53°33'82 N 0 05'60 E	E 53°32'72 N 0 04'40 E	F 53°36'59 N 0 00'75 E						
Before High Water	Directions of streams (degrees)	119	1.5 0.9	180	0.1 0.1	130	1.3 0.9	126	0.9 0.5	168	0.2 0.1	100	0.9 0.0
		239	1.4 0.6	261	1.5 0.9	331	1.8 0.7	327	0.8 0.3	296	0.6 0.3	288	1.1 0.4
		283	3.1 1.4	275	2.3 1.3	323	2.6 1.1	320	2.1 1.0	306	1.8 0.9	296	2.7 1.1
		281	3.8 1.8	285	3.1 1.8	310	3.8 1.7	317	2.8 1.4	301	2.2 1.1	294	3.1 1.5
		273	3.4 1.6	289	3.1 1.7	304	3.4 1.5	310	2.9 1.4	302	2.3 1.1	306	3.0 1.8
		284	2.9 1.0	298	2.4 1.4	271	1.9 0.8	308	2.3 1.1	301	1.8 0.9	317	2.4 1.4
High Water	Rates at spring tides (knots)	318	0.9 0.4	320	1.0 0.6	106	0.3 0.2	312	0.7 0.3	295	0.7 0.3	345	0.8 0.5
		051	1.6 0.9	069	1.2 0.5	135	2.3 1.4	120	1.1 0.7	087	1.0 0.5	090	0.9 0.0
		076	2.7 1.5	093	2.7 1.3	122	3.3 1.9	128	2.4 1.3	100	2.5 1.2	116	2.2 0.8
		106	4.1 2.3	112	3.0 1.4	119	4.3 2.5	132	3.1 1.7	113	2.5 1.2	116	2.8 1.6
		109	4.0 2.2	116	2.2 1.0	122	3.7 2.1	133	2.9 1.6	107	1.7 0.8	113	3.0 1.7
		109	2.8 1.6	116	1.3 0.6	125	2.6 1.6	130	2.1 1.2	123	1.3 0.6	117	2.3 1.7
After High Water	Rates at neap tides (knots)	112	1.8 1.1	123	0.4 0.1	126	1.8 1.2	126	1.3 0.8	157	0.6 0.2	100	1.3 1.1

5614\_17(A)

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

Hours	Geographical Position	A 53°35'52 N 0 01'80 W	B 53°37'00 N 0 02'27 W	C 53°37'12 N 0 06'70 W			
Before High Water	Directions of streams (degrees)	149	0.8 0.6	105	1.4 0.0	104	2.1 1.3
		221	0.5 0.3	281	1.2 0.6	090	0.1 0.2
		270	1.2 0.5	277	2.8 0.8	290	2.1 0.9
		280	1.7 0.7	278	3.5 1.1	303	2.9 1.3
		287	1.7 0.7	278	3.4 1.2	297	2.9 1.3
		290	1.2 0.4	282	2.4 0.2	294	2.6 1.2
High Water	Rates at spring tides (knots)	276	0.4 0.1	286	1.1 0.2	300	1.5 0.6
		117	0.7 0.5	081	0.8 0.6	107	0.6 0.5
		117	1.9 1.1	097	2.5 1.5	117	2.5 1.5
		116	2.6 1.5	102	3.0 1.6	122	3.4 1.9
		120	2.5 1.6	099	3.1 2.0	114	3.4 1.9
		126	1.9 1.2	094	2.5 1.8	105	3.0 1.7
After High Water	Rates at neap tides (knots)	137	1.1 0.8	106	1.6 1.2	105	2.4 1.4

5614\_18(A)

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

Hours	Geographical Position	A 53°38'22 N 0°10'65 W	B 53°41'35 N 0°13'83 W		
Before High Water	Directions of streams (degrees)	132	2.6 0.8	163	3.3 1.0
		239	0.2 0.2	175	1.1 0.2
		303	2.2 1.1	355	2.3 1.2
		305	3.3 1.7	340	3.0 1.5
		314	3.2 1.7	334	3.1 1.8
		315	3.0 1.1	337	3.3 1.3
High Water	Rates at spring tides (knots)	319	1.3 0.3	324	1.4 0.5
		122	1.3 0.7	129	1.1 0.6
		133	3.3 1.4	160	2.5 1.5
		129	4.0 2.4	158	3.1 2.1
		132	4.4 2.8	157	3.9 2.4
		126	3.5 2.6	155	4.3 2.5
After High Water	Rates at neap tides (knots)	132	2.9 1.6	164	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 0°17'20 W	53°43'85 N 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	Directions of streams (degrees)	266	239
		112	103
		098	068
		101	067
		103	066
		106	063
After High Water	Directions of streams (degrees)	108	063
		106	063
		103	066
		101	067
		098	068
		112	103
Rates at spring tides (knots)			
Rates at neap tides (knots)			

**5614\_19(C)** Tidal Streams referred to HW at IMMINGHAM (Normal river current included)

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

**5614\_21** Tidal Streams referred to HW at IMMINGHAM

Hours	Geographical Position	53°59'9 N 0 17.3 E	53°54'0 N 0 12.2 E	53°50'0 N 0 26.5 E	53°42'1 N 0 10.3 E	53°37'0 N 0 26.4 E	53°33'8 N 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	Directions of streams (degrees)	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	339	350	040
After High Water	Directions of streams (degrees)	329	317	316	325	341	040
		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
Rates at spring tides (knots)							
Rates at neap tides (knots)							

**5614\_22(A)** Tidal Streams referred to HW at RIVER TEE ENTRANCE

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

**5614\_24** Tidal Streams referred to HW at RIVER TEE ENTRANCE

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

**5614\_25** Tidal Streams referred to HW at DOVER

Hours	Geographical Position	54°09'0 N 4 51.0 E	54°09'0 N 6 11.0 E	54°02'1 N 2 53.8 E	54°00'3 N 1 06.0 E	53°45'0 N 5 58.0 E	53°24'0 N 4 09.4 E	53°20'0 N 2 44.0 E	53°19'0 N 1 25.4 E	52°33'9 N 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	080	080	154	173	138	205
		154	074	163	324	082	193	194	141	206
High Water	Directions of streams (degrees)	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	Directions of streams (degrees)	055	251	090	137	285	031	059	164	017
		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	080	080	154	173	138	205
Rates at spring tides (knots)										
Rates at neap tides (knots)										

**5614\_25 continued**

52°29'0 N 2 43.0 E	51°55'0 N 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 &amp; HEIGHT DIFFERENCES FOR PREDICTING THE TIDE AT SECONDARY PORTS

PLACE	Lat. N	Long. E	High Water				Low Water				HEIGHT DIFFERENCES (IN METRES)			
			Zone UT (GMT)				Zone UT (GMT)				MHWS	MHWN	MLWN	MLWS
<b>LOWESTOFT</b> .....	<b>52 28</b>	<b>1 45</b>	<b>0300</b> and <b>1500</b>	<b>0900</b> and <b>2100</b>	<b>0200</b> and <b>1400</b>	<b>0800</b> and <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 of NON-REFERENCE STANDARD PORTS *							
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>53 38</b>	<b>0 11</b>	<b>0100</b> and <b>1300</b>	<b>0700</b> and <b>1900</b>	<b>0100</b> and <b>1300</b>	<b>0700</b> and <b>1900</b>	<b>7.3</b>	<b>5.8</b>	<b>2.6</b>	<b>0.9</b>				
Cromer .....	52 56	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	0	0				
Blakeney .....	52 57	1 01	+0115	+0055	0	0	-3.9	-3.8	0	0				
Wells Bar .....	52 59	0 49	+0020	+0020	+0020	+0020	-1.3	-1.0	0	0				
Wells .....	52 58	0 51	+0035	+0045	+0340	+0310	-3.8	-3.8	‡	‡	*			
Burnham (Overy Staithe).....	52 58	0 45	+0045	+0055	0	0	-5.0	-4.9	0	0				
<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	0				
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	0	-0.3	-0.6	0	0				
Fosdyke Bridge .....	52 52	0 02	+0034	+0049	+0137	+0220	-0.7	-1.3	-1.0	-0.2†				
Tabs Head .....	52 56	0 05	0000	+0005	+0125	+0020	+0.2	-0.2	-0.2	-0.2				
<b>BOSTON</b> .....	<b>52 58</b>	<b>0 01</b>	STANDARD PORT				See Table of NON-REFERENCE STANDARD PORTS							
Skegness .....	53 09	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 of NON-REFERENCE STANDARD PORTS							
Bull Sand Fort .....	53 34	0 04	-0020	-0030	-0035	-0015	-0.4	-0.3	+0.1	+0.2				
Sunk Dredged Channel .....	53 37	0 02	-0012	-0015	-0018	-0016	-0.2	-0.2	+0.1	+0.3				
GRIMSBY .....	53 35	0 04	STANDARD PORT				See Table of NON-REFERENCE STANDARD PORTS							
HUMBER SEA TERMINAL .....	53 40	0 14	STANDARD PORT				See Table of NON-REFERENCE STANDARD PORTS							
IMMINGHAM .....	53 38	0 11	STANDARD PORT				See Table of NON-REFERENCE STANDARD PORTS							
HULL (KING GEORGE DOCK).....	53 44	0 16	STANDARD PORT				See Table of NON-REFERENCE STANDARD PORTS							
Hull (Alexandra Dock) .....	53 44	0 18	+0012	+0012	+0022	+0019	+0.3	+0.2	-0.1	-0.2				
HULL (ALBERT DOCK) .....	53 44	0 21	STANDARD PORT				See Table of NON-REFERENCE STANDARD PORTS							
Humber Bridge.....	53 43	0 27	+0027	+0022	+0049	+0039	-0.1	-0.4	-0.7	-0.6				
Brough .....	53 43	0 34	+0045	+0034	+0141	+0118	-1.2	-1.4	-1.1	-0.7				
<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 of NON-REFERENCE STANDARD PORTS							
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 of NON-REFERENCE STANDARD PORTS *							

<b>RIVER TEES ENTRANCE</b> .....	<b>N</b> <b>54 38</b>	<b>W</b> <b>1 09</b>	<b>0000</b> and <b>1200</b>	<b>0600</b> and <b>1800</b>	<b>0000</b> and <b>1200</b>	<b>0600</b> and <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
<b>WALTON-ON-THE-NAZE</b> .....	<b>N</b> <b>51 51</b>	<b>E</b> <b>1 17</b>	<b>0100</b> and <b>1300</b>	<b>0700</b> and <b>1900</b>	<b>0100</b> and <b>1300</b>	<b>0700</b> and <b>1900</b>	<b>4.2</b>	<b>3.4</b>	<b>1.1</b>	<b>0.4</b>
<i>Orford Haven</i>										
Orford Quay .....	52 05	1 32	+0040	+0040	+0055	+0055	-1.4	-1.1	0.0	+0.2
Slaughden Quay .....	52 08	1 35	+0105	+0105	+0125	+0125	-1.3	-0.8	-0.1	+0.2
Iken Cliffs .....	52 09	1 31	+0130	+0130	+0155	+0155	-1.3	-1.0	0.0	+0.2

○ 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 of Non-Reference Standard Ports				
STANDARD PORT	MHWS	MHWN	MLWN	MLWS
GORLESTON-ON-SEA	2.4	2.1	1.0	0.5
BOSTON	6.6	4.6	1.9	1.3
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
IMMINGHAM	7.3	5.8	2.6	0.9
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.

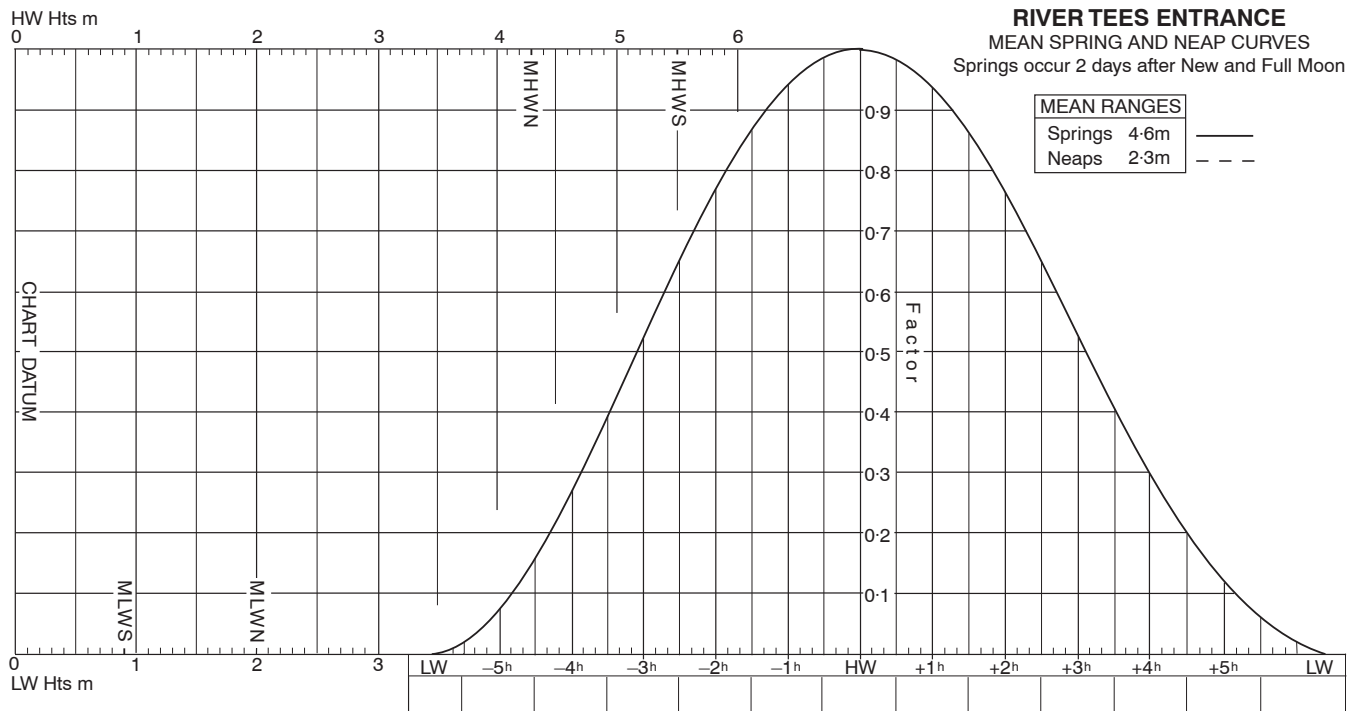
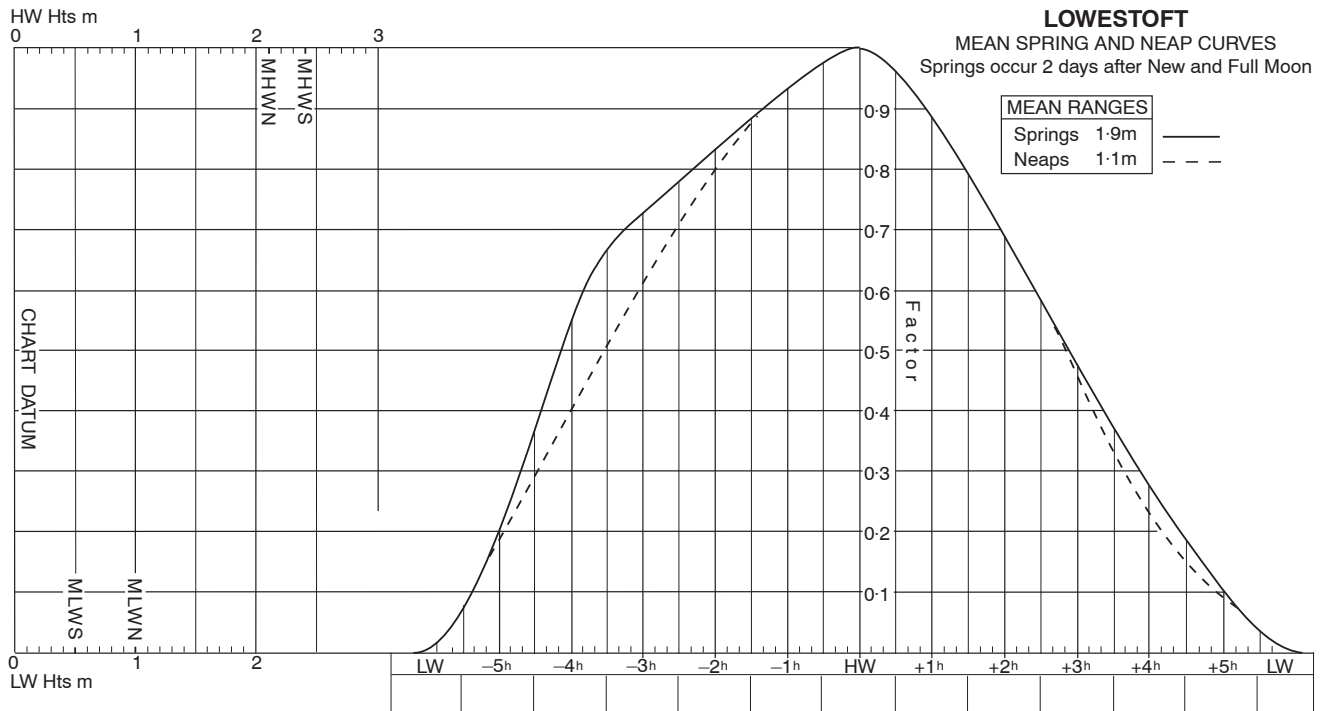
Low water time differences at Wells are for the end of a low water stand which lasts about 4 hours at springs and about 5 hours at neaps.

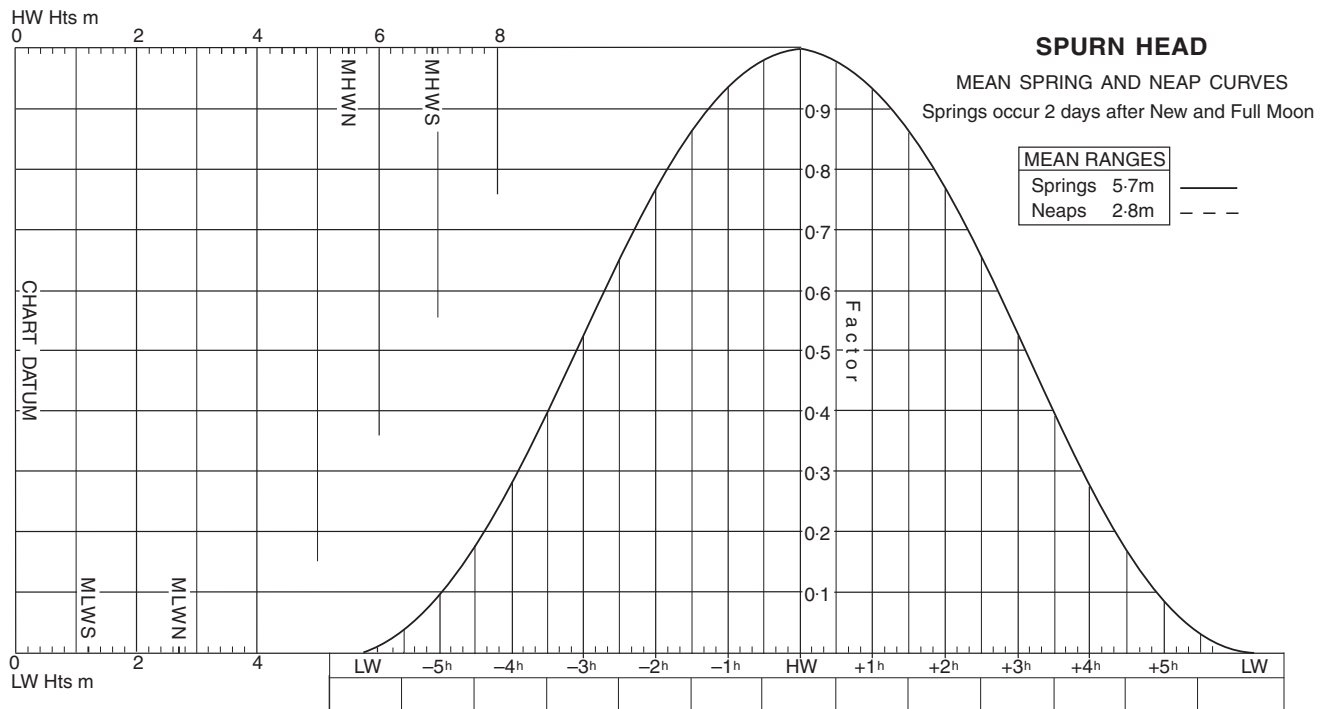
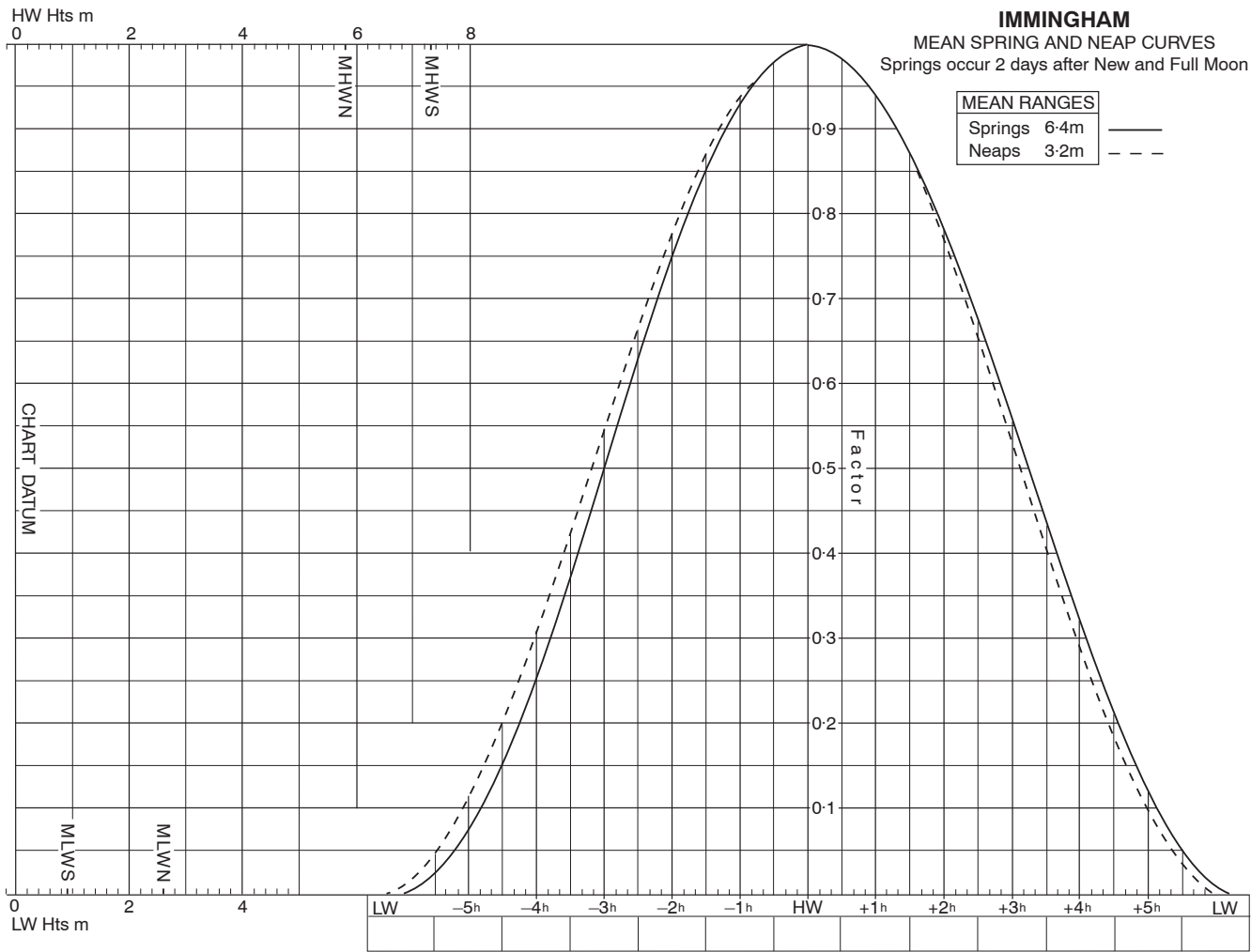
At Burton Stather, normal river level is about 0.1m below chart datum.

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





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



### WALTON-ON-THE-NAZE

#### MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon

