

**DEADLINE 5 REPRESENTATIONS**

**ON BEHALF OF PORT OF TILBURY LONDON LIMITED AND LONDON GATEWAY  
PORT LIMITED**

**REGARDING AN APPLICATION FOR A DEVELOPMENT CONSENT ORDER IN  
RESPECT OF THE PROPOSED THANET EXTENSION OFFSHORE WIND FARM**

**29 APRIL 2019**

## 1) Introduction

This document provides a response on behalf of Port of Tilbury London Limited (POTLL – ‘Other Person’ reference TEOW-OP006) and London Gateway Port Limited (LGPL – Registration No. 20011837) to Deadline 5 matters, as set out at Item 25 of the Examining Authority’s (EXA’s) Rule 8(3) and Rule 9 letter dated 9 April 2019. More specifically this document provides:

- A response to the ISH8 Action Points published by the Examining Authority (ExA) on 18 April 2019;
- POTLL and LGPL's ISH8 written summary of submissions (Appendix A to this document);
- Comments on the Applicant's and other Interested Parties' Deadline 4, 4B and 4C submissions (Section 3 of this document); and
- A final version of the HR Wallingford Report provided in draft in POTLL and LGPL's Deadline 4C representations at Appendix 1 (document reference REP4C-016) (Appendix B to this document).

## 2) Response to ISH8 Action Points

The following sections utilise the referencing set out in the EXA’s ISH8 Action Points document published on 18 April 2019 and, for convenience, begin by setting out the Action Point title and specific action (in blue type). For clarification, this document responds only to ISH8 Action Points requiring response by Deadline 5.

### Action Point 1 – Submission of material presented at ASI2 on 15 April 2019

Port of Tilbury London Limited to submit to Examination Library:

- Copy of presentation given at ASI2 on 15 April 2019

Copy of presentation provided at Appendix C to this document.

- Masterplan of facility

Copy of masterplan provided at Appendix D to this document.

DP World London Gateway to submit:

- Masterplan of facility

Drawing ref: LG-ASA-PRK-MPN-C10001-DRA-ART-0300 Rev. 2 provided within Appendix E sets out the site masterplan for the DP World Port and Logistics Park development. The shaded/ghosted site areas represent consented, but as yet unimplemented development. As such, the specific layout of these areas as shown is indicative.

### Action Point 5 – Policy Considerations – EN-3 para 2.6.166

Provided in POTLL and LGPL's ISH8 written summary of submissions contained at Appendix A to this document.

### Action Point 17 – Potential Commercial, Employment and Economic Effects

All IPs to present evidence on potential commercial, employment or economic consequences of effects of the proposed development

#### Economic

Table 2 of POTLL and LGPL's Deadline 2 submission (document reference REP2-050) provided the following information regarding mix of vessels (by length) visiting Port of Tilbury London (POTL) and DP World London Gateway (DPWLG) in the period 1 December 2017 to 30 November 2018. For ease of reference, Table 2 is repeated below:

Table 1 – Mix of vessels visiting POTL and DPWLG by length (Table 2 of doc ref: REP2-050)

Vessel Length	POTL		DPWLG	
	Number	%	Number	%
0 – 50m	1191	33.0	1	0.1
50 – 100m	436	12.1	0	0.0
100 – 150m	711	19.7	18	1.7
150 – 200m	909	25.2	121	11.4
200 – 250m	325	9.0	165	15.6
250 – 300m	32	0.9	482	45.6
300 – 350m	1	0.0	204	19.3
350 – 400m	0	0.0	67	6.3

Information provided in response to Action Point 19 below indicates that:

- a) 17% and 7.5% of all inbound vessel visits to POTL and DPWLG respectively utilised the inshore route; and
- b) 50% and 15% of all inbound vessel visits to POTL and DPWLG respectively boarded a pilot at NE Spit.

Unfortunately, information relating to the use of the inshore route and NE Spit pilot boarding station is not specified in terms of vessel mix. Applying the proportions of vessels set out in (a) and (b) above pro-rata to the vessel numbers provided in Table 1 allows an outline assessment of the likely vessel mix (by length) utilising the inshore route or NE Spit to be established. This is indicated by Table 2 and Table 3 below.

Table 2 – Pro-rata assessment of breakdown of vessels utilising inshore route

Vessel Length	Number	
	POTL	DPWLG
0 – 50m	202	0
50 – 100m	74	0
100 – 150m	121	1
150 – 200m	155	9
200 – 250m	55	12
250 – 300m	5	36
300 – 350m	0	15
350 – 400m	0	5

Table 3 – Pro-rata assessment of breakdown of vessels boarding a pilot at NE Spit

Vessel Length	Number	
	POTL	DPWLG
0 – 50m	596	0
50 – 100m	218	0
100 – 150m	356	3
150 – 200m	455	18
200 – 250m	163	25
250 – 300m	16	72
300 – 350m	1	31
350 – 400m	0	10

Based on the pro-rata assessments set out in Tables 2 and 3 it is possible to approximate how many vessels would be affected in the event that vessels of a certain size were prevented from continuing to either (i) utilise the inshore route or (b) board pilots at the NE Spit as a result of the TEOF. For example, on the assumption that all vessels above 250m would be prevented from utilising the inshore channel it could be concluded that five POTL inbound vessels and 56 DPWLG inbound vessels would be required to re-route in a 12 month period.

At paragraph 16 of their Deadline 4C representations POTLL and DPWLG indicate that the NRAA gives more comfort with regard to the transit of ships via the inshore channel. In the absence of a robust pilotage simulation study, however, the effect of the combination of pilotage operations and transits 'co-existing' in the same constrained space is not well enough understood to draw any conclusions regarding the impacts on the inshore route. This was explained in more detail in POTLL and LGPL's Deadline 4C representations and was set out in detail by the ports at ISH8 (see PoTLL and LGPL's ISH8 written summary of submissions at Appendix A to this document for reference). As such,

it is not currently possible to properly assess the economic impact in terms of transiting vessels. POTLL and LGPL consider that once a robust pilotage simulation study has been carried out it will be possible for the Applicant and IPs to provide a more substantiated and robust assessment of the economic impacts of the project.

With regard to pilotage, the Pilot Simulation Study (document reference APP-090) which informed the Applicant's original Navigation Risk Assessment (document reference APP-089) only considered vessels of up to 240m in length. Thus, in the absence of a revised Pilot Simulation Study, it is reasonable to assume (as indeed it would appear the Applicant did when undertaking the Pilot Simulation Study) that vessels over 240m would seek alternative boarding arrangements. The projected likely numbers of vessels boarding a pilot a NE Spit shown in Table 3 suggests that at least 17 vessels inbound to POTL and 113 inbound to DPWLG would be above this length (a total of 130 inbound vessels would therefore be affected). It is to be noted that these levels are based on an outline assessment of year ending 30 November 2018 data and do not account for growth in vessel traffic over the reasonable planning horizon, which POTLL/DPWLG contend will be significantly greater than the 10% allowance suggested and made by the Applicant.

The effects of vessels being required to seek alternative pilot boarding locations are varied but include potential delay (particularly where tidal windows or berth availability are relevant) and re-routing. The force of such impacts will depend on the circumstances (i.e. metocean conditions, pilot availability, etc.) at the time. As such it is not possible to provide a full quantitative assessment of economic consequence or effects at this stage.

It is noted that the Applicant has not carried out a quantitative assessment of economic impacts in its application documents. As set out in POTLL and LGPL's Deadline 3 submission (document reference REP-070) in the Planning Policy Position Paper, the lack of regard to economic loss to the shipping and navigation industries is contrary to national policy (see in particular paragraph 2.6.162 of NPS EN-3 (note that the paper comments that the inshore route in question is at the very least a major commercial navigation route)). In respect of quantifying potential costs to property, Table 17 of the Applicant's NRA Addendum (document reference REP4B-002) sets out the approach to categorisation for the four types of consequence considered therein (people; property; environment; and stakeholders/business). With regard to 'property' and 'stakeholder/business' the following cost ranges are cited:

Category 1:	<£10k
Category 2:	£10k to £100k
Category 3:	£100k to £1M
Category 4:	£1M to £10M
Category 5:	>£10M

With reference to Table 18 and Figure 25 of the NRA Addendum it can be determined that risks which score above ALARP include Category 3 risks which occur yearly. Thus, if the effect on vessels required to seek alternate pilot boarding locations was greater than £769 per vessel (i.e. £100,000 divided across the projected likely 130 inbound vessels

affected per annum) then the risk to stakeholders/business (i.e. the economic risk) would give rise to a score above ALARP. A level of consequence or effect of £769 or greater per vessel is highly likely, particularly when the ship charter rates set out in Table 11.4 of the HR Wallingford report (at Appendix B to this document) are taken into account (a charter rate of between \$20,000 and \$30,000 per day for ships over 5,300 TEU capacity) and the tidally affected draft of such vessels. As such, even by the Applicant's own low level and deficient economic assessment, economic impacts can be seen to be at an unacceptable level.

## **Commercial**

As with economic impact, it is not possible to quantitatively assess the potential commercial impacts of the TEOWF at this stage. Indeed, economic impact is considered to be the primary cause of commercial impact, given that economic factors play a significant role in commercial decision-making. Qualitatively, however, it is clear that delays to shipping (in particular unforeseen delays such as those which may occur as a result of loss of resilience of pilot boarding operations) have the potential to affect the commercial decision-making of suppliers regarding their choice of shipping lines/routes, ports and locations for warehousing. This may particularly be the case with regard to the transport of produce and other perishable goods (noting the significant quantities of perishable goods currently transported via POTL/DPWLG as discussed in response to Action Point 19 below).

## **Employment**

It is not possible to quantitatively assess the effects on local/regional employment as a result of the interruption/delay to shipping. In qualitative terms however, an Economic Development Needs Assessment (EDNA) published in December 2017 by GVA on behalf of the South Essex combined authorities (<https://www.thurrock.gov.uk/sites/default/files/assets/documents/lptech-south-essex-edna124-201712-v01.pdf>) identifies (Table 82) that South Essex is forecast to be subject to an employment creation figure of 52,792 in the period to 2036. 24,520 of that employment creation is forecast to take place in Thurrock (where both DPWLG and POTL are located), with 'B' class uses accounting for 16,402 jobs. In setting out the South Essex economic growth drivers the EDNA states the following in relation to Transport and Logistics:

*"Para 8.9 – This activity has a strong sector presence in South Essex, with the core cluster of activity evident in Thurrock. Basildon has some strengths in this activity, and Rochford has been seeing an increasing role in recent years, but not at the scale at which Thurrock accommodates this activity related to the authorities key ports; Tilbury, Purfleet and London Gateway.*

*Para 8.10 – The strength of this type of activity is expected to be further increased, particularly in Thurrock driven by its proximity to London and other key exporting centres, its road infrastructure connectivity, current and future investment into the infrastructure required to support this sector (such as London Gateway), and the*

*comparatively affordable rents offered for this type of activity in Thurrock compared with existing London locations (such as Barking & Dagenham).*

*Para 8.11 – The transport and logistics sector is therefore expected to be a strong growth sector for South Essex, driven particularly by its growth potential in Thurrock, over the projection period for this study (2016 – 2036).”*

In qualitative terms therefore, the ENDA suggests that the Thurrock, and indeed the wider South Essex, economy (including its ability to create the forecast number of jobs) may be highly sensitive to proposals which have a detrimental impact on the efficient operations of ports and shipping.

#### **Action Point 19 – Ship traffic data**

PoT and LGPL to clarify their REP3-070 submission by submitting evidence on numbers of ships and volume of freight or passengers served at Tilbury and London Gateway in relation to overall numbers of ships and volume of freight or passengers served at London and Sheerness ports, by type of cargo or passengers and for a period or periods relevant to the NRA; with an estimate of the proportion of which are passing over NE Spit or transferring a pilot at or near NE Spit diamond.

The EXA is in passenger/cruise vessel as well as freight utilisation.

POTLL and LGPL are unable to comment on volume of freight or passengers served at Sheerness ports. In respect of volume of ships, the HRW report identifies (at Table 4.1 and 4.2) that Medway ports served a total of 207 container vessels and 186 RoRo vessels in 2017.

Regarding POTL and LGPL vessel calls, in comparison to the total number of vessel calls for all London Ports, information is provided within: (a) Table 1 of LGPL and POTLL’s Deadline 2 representations (document reference REP2-050); and (b) Figure 26 of the Applicant’s NRA Addendum (document reference REP4B-002). A proportional comparison of numbers of vessel calls has been distilled from these documents and is presented within Table 4 below for a comparison year of 2017 (the final year for which information was provided by the Applicant for the total number of vessel calls to London Ports).

Table 4 – Comparison of numbers of vessel calls to London Ports in 2017

	Number of Vessel Calls	Percentage of Total
POTL	3,006	38.5%
DPWLG	866	11.1%
All London Ports	7,800	100%

In terms of volume of freight, a proportional comparison for 2017 is provided within Table 5.

Table 5 – Comparison of volumes of freight throughput at London Ports in 2017

	Volume (Tonnes)	Percentage of Total
POTL	13,008,000	26.1%
DPWLG	7,768,189	15.6%
All London Ports	49,868,396 <sup>1</sup>	100%

<sup>1</sup>data provided by Port of London Authority

Further data for the wider period 2015 to 2018 is provided within Table 6 below.

Table 6 – Number of vessel calls and volume of cargo to POTL/DPWLG

	DPWLG		POTL		All London Ports	
	Throughput (Tonnes)	No. of Ship Visits	Throughput (Tonnes)	No. of Ship Visits	Throughput (Tonnes) <sup>1</sup>	No. of ship Visits <sup>2</sup>
<b>2015</b>	3,757,085	406	12,558,000	2,543	45,430,420	7,600
<b>2016</b>	5,770,273	519	13,506,000	3,119	50,360,067	7,800
<b>2017</b>	7,768,189	866	13,008,000	3,006	49,868,396	7,800
<b>2018</b>	10,756,378	1,058	12,858,000	3,146	53,196,057	N/A

<sup>1</sup>data provided by Port of London Authority

<sup>2</sup>data obtained from Figure 26 of Applicants NRA Addendum (document ref: REP4B-002) – Note: 2018 data unavailable

The ports are unaware of any information which has been submitted by the Applicant or PLA to date regarding the total volume of various types of cargo or passengers for all London ports and thus are unable to provide comparison with the same for POTL/DPWLG. The following paragraphs comment on the types of cargo handled at POTL and DPWLG more generally.

#### DPWLG

Aside from a small quantity of bulk aggregates imported in association with the Aggregate Industries aggregate and concrete supply facility, throughput at DPWLG is almost entirely containerised. No passenger vessels are handled at DPWLG.

#### POTL

POTL handles a range of containerised and bulk products via its riverside and lock berths. A breakdown of the types of cargo handled at POTL in the period from 1 December 2017 to 30 November 2018 is provided within Section 8.3 to 8.8 of the HRW report. This represents the period of AIS and POLARIS data analysed by HR Wallingford on behalf of POTLL/LGPL. The Applicant subsequently obtained and analysed additional data for the year period to February 2018 to inform the NRA Addendum (document reference REP4B-002). Thus it is not possible for LGPL/POTLL to draw direct comparison with “the period or periods relevant to the NRA” as the Applicant chose a different date range to inform the NRA.



One type of cargo which is particularly sensitive to delay is perishable cargo, for example perishable food. In this regard it is to be noted that LGPL had a total throughput of 147,942 TEU in reefer (refrigerated) containers in the period 1 December 2017 to 30 November 2018. This equates to 11.2% of all throughput in this period. In the same period POTL handled 789,611 tonnes of perishable cargo (excluding any perishables that arrived via the RoRo facility, the quantity of which is unknown), equivalent to approximately 6% of total throughput.

Passenger vessel visits to POTL are discussed within Section 8.7 of the HRW report. Information provided by POTL has confirmed that the total number of passenger vessels visiting POTL in the period 1 December 2017 to 30 November 2018 was 63, resulting in a total passenger throughput of 109,692 persons. Section 8.7 of the HRW report suggests that at least 20 of such passenger vessels transited through Gate 1 (i.e. via the inshore channel). This represents 31.7% of the total ship visits and, taking a pro-rata approach would equate to 34,823 passengers.

The HRW report provides information regarding the number of vessels inbound to POTL and DPWLG which utilised the inshore route and NE Spit pilot boarding area in the period from 1 December 2017 to 30 November 2018. This is summarised in Table 7 below.

Table 7 – Use of inshore and NE Spit by POTL/DPWLG inbound vessels (Dec 17 to Nov 18)

Port	Inshore Route	NE Spit
POTL	534	754
DPWLG	79	160
Total	613	914

Section 6.6 of the HRW report identifies that the figures in Table 7 relating to pilotage operations at NE Spit represent 50% and 15% of all inbound piloted vessel calls to POTL and LGPL respectively.

Whilst the data presented in Tables 6 (2018 data) and 7 above represents time periods separated by one month (Table 6 represents year ending 31 December 2018 whilst Table 7 represents year ended 30 November 2018) it is considered that the data is broadly comparable due to the small deviation in timescale. By comparison of the 2018 total ship call figures to POTL and LGPL shown in Table 3 and figures relating to vessels utilising the inshore route shown in Table 7, it can be concluded that approximately 17% and 7.5% of vessels visiting POTL and LGPL respectively utilise the inshore route.

### **3. Comments on the Applicants and other Interested Parties Deadline 4, 4B and 4C submissions**

Comments are provided under the following sub-headings. For convenience each comment is preceded by the title and reference of the document being commented upon (in blue type).

### 3.1 Deadline 4 Submissions

#### **Document Ref: REP4-006: Vattenfall Wind Power Limited: Appendix 4 to Deadline 4: Response to Deadline 3 Submissions by Interested Parties – Shipping and Navigation**

*Section 2, Page 15: Response to PLA/ESL - The Applicant's response states "in the 12 months of data analysed by the Applicant 3978 vessels were identified between Elbow Buoy and the wind farm equating to approximately 10.9 vessels per day. This is similarly reflected in the figure provided by POTLL and DPWLG at Deadline 3, of 4114 vessels using the inshore route, or 11.2 vessels per day."*

We take the opportunity to highlight that the difference in number of vessels using the inshore route identified by the Applicant's data (3978 for the year ending February 2018) and the POTLL/DPWLG data (4114 for the year ending November 2018) of 136 vessels represents a 3.4% increase in vessel numbers utilising the inshore route in a period of only 9 months. While this information represents a relatively limited dataset to inform growth trends, POTLL/DPWLG contend that this is indicative of the level of growth being experienced at the two ports and casts further doubt over the appropriateness of the 10% allowance for increase in vessel numbers utilised by the Applicant for the purpose of NRA in the reasonable planning horizon (i.e. 35 years from 2019).

#### **Document Ref: REP4-007: VATTENFALL Wind Power Limited: Appendix 5 to the Deadline 4 Submission – Responses to comments on Shipping Policy Considerations**

*Paragraph 7 – "Impacts on ports are not therefore prohibited by the draft policy, however as the Applicant has explained it considers that the proposals would not cause any effects on port activity."*

As discussed in Section 2 of this document, whilst the extent of impact is currently difficult to quantify it is clear that some impact to ports would occur as a result of the TEOWF proposals. The discussion of economic impact set out above suggests that such impact is likely to be above ALARP.

*Paragraph 34 – "The additional transit distance between the inshore route and the most likely alternative has been estimated as between 11nm by the Applicant and 14nm by other interested parties. This would equate to approximately an additional 20 -40 minutes of steaming."*

To achieve the suggested 20 to 40 minutes of additional steaming time suggested by the applicant for an 11 to 14nm diversion, vessels would need to be travelling between 16.5 – 33 knots (11nm diversion) or 21 – 42 knots (14nm diversion). In fact, with reference to the 10 vessels highlighted in Table 7.3 of the HRW Report (Document Ref: REP4C-016), information provided within the

[www.marinetraffic.com](http://www.marinetraffic.com) website suggests that on average deep sea container vessels have a top speed of 16.2 knots and an average speed of 14 knots. At an average speed of 14 knots an 11nm to 14nm diversion would require an additional 47 to 60 minutes of steaming. Thus the Applicant's estimates of additional steaming time appear to be significantly understated.

### 3.2 Deadline 4B Submissions

No further comments at this stage.

### 3.3 Deadline 4C submissions

#### Document Ref: REP4C-003: Vattenfall Wind Power Ltd: Appendix 2 at Deadline 4C: Statement of Evidence

Paragraph 80 – With regard to the hazard workshop on 29 March 2019: *“Thus all the input likelihood and consequence values for baseline and inherent assessment of risk relating to these 4 hazards were agreed by the parties.”*

Paragraph 92 – *“As described above, at the hazard workshop meeting the IPs agreed the inputs to the baseline and inherent risk assessment for 4 identified hazards”.*

POTLL and DPWLG contend that the basis for scoring of consequence was not clearly understood during the hazard workshop on 29 March 2019. For example, in terms of a collision of a Class 1 or 2 vessel in the ‘most likely’ scenario, it was not understood what exactly parties were supposed to consider that the Class 1 or 2 vessel would be colliding with (noting that it was agreed that any collision with a fishing vessel (including a glancing blow) would result in the sinking of that vessel). In terms of the consequences for Stakeholders/Business or Property, the effects of a collision were not discussed. For example, if the collision were to result in the sinking of a fishing vessel (with a strong potential for loss of life) it is not clear whether the Class 1 or 2 vessel involved (or its operators) would be required to remain on the scene or to wait at a nearby port whilst incident investigation took place. It remains unclear whether loss of value of perishable goods (as a result of delay to the vessel) would fall to be considered as a Property or Stakeholder/Business consequence. Indeed it did not appear that loss of value of cargo had been considered in any of the four consequence categories.

After being provided with the resulting scores from the hazard workshop on 1 April 2019 (the first opportunity LGPL and POTLL had to clearly see the scores resulting from the discussion at the hazard workshop), the ports raised the above concerns during a conference call between the Applicant and IPs held on 2 April 2019. The ports also raised these concerns regarding the scoring of consequences in an e-mail sent to the Applicant dated 5 April 2019 (see email to Daniel Bates at **Appendix F**), following receipt of the hazard workshop minutes on the afternoon of 4 April 2019.

Paragraph 106 – *“Following the workshop DPWLG identified that for Hazard ids 1-3 the “most likely” stakeholder outcome could be increased from a negligible to a minor level consequence”.*

As indicated by the copy of POTLL/DPWLG’s e-mail to the Applicant dated 5 April 2019 (see **Appendix F**), POTLL/DPWLG did not make any reference to an uplift to a “minor level consequence”. Instead it is clear that the ports' email correspondence highlighted uncertainty regarding the effects of such a collision for cargo vessels and outlined the potential for *“significant costs to business (operating costs of ship and potential loss of cargo (particularly if perishable))”*. It is noted that the Applicant did not provide a response to this e-mail and no further discussion took place on this topic between the ports and the Applicant prior to ISH8. POTLL/DPWLG therefore remain of the view that: (a) the scoring of risks discussed at the hazard workshop was not agreed; and (b) the scoring with regard to the consequence for property and Stakeholders/Business in the NRA Addendum is not robust.

**APPENDIX A**

**POTLL AND LGPL'S ISH8 WRITTEN SUMMARY OF SUBMISSIONS**



Pinsent Masons

**APPLICATION BY VATTENFALL WIND POWER LIMITED FOR A DCO FOR THE THANET EXTENSION OFFSHORE WIND FARM  
ISSUE SPECIFIC HEARING 8 (ISH8) 16-17 APRIL 2019 - ENVIRONMENTAL, SHIPPING, MARITIME, FISHING AND OTHER MATTERS**

**WRITTEN SUMMARY OF SUBMISSIONS**

**OF**

**PORT OF TILBURY LONDON LIMITED AND LONDON GATEWAY PORT LIMITED**

**SUBMITTED AT DEADLINE 5 (29 APRIL 2019)**

1. ISH5 was held on 16 and 17 April 2019 at Building 500, Discovery Park, Ramsgate Road, Sandwich, CT13 9FF. ISH8 did not take the usual form of running through items listed in the agenda (published by the Examining Authority ("ExA") on 9 April 2019) (the "Agenda"). Instead, Interested Parties ("IPs") were invited to make broad submissions under Agenda topics and cross-examination of expert witnesses was also allowed. For ease of reference, the format of this note follows that of the Agenda and summarises the joint responses of Port of Tilbury London Limited ("PoTLL") and London Gateway Port Limited ("LGPL") given at ISH8 under each item. This note may not, therefore, record the exact order of statements made; however, it does capture the essence and thrust of the submissions of the two ports as far as possible. There were also a number of Agenda items for which there was insufficient time at ISH8 for a discussion and this note provides the joint responses of PoTLL and LGPL to such items.
2. The ExA published its "ISH8: Hearing Action Points" document on 18 April 2019 and this note refers to the actions noted in that document where appropriate.

Agenda Item/ Issue	Response
<b>(1) Welcome, introductions and arrangements for this Issue Specific Hearing 2 (ISH8)</b>	
In attendance on behalf of PoTLL and LGPL were:	

Agenda Item/ Issue	Response
<ul style="list-style-type: none"> <li>• Trevor Hutchinson (TH Planning and Transportation);</li> <li>• Geoff Holland (Harbour Master, PoTLL);</li> <li>• Robbie Owen (P'insent Masons LLP);</li> <li>• Matthew Carpenter (P'insent Masons LLP); and</li> <li>• Vincent Crockett (HR Wallingford (HRW)).</li> </ul>	<p><b>(2) Procedural Implications of Submissions at Deadlines 3, 4, 4B and 4C</b></p> <p>The ExA will review all documents amending the application or addressing advice provided to the applicant under s51 PA2008 submitted at Deadlines 3, 4, 4B and 4C. The procedural implications of those documents will be considered, including:</p> <p>(The ExA will seek comments from IPs)</p> <p>(The Applicant will be provided with a right of reply)</p>
<p>a) The SEZ Material Change request submitted at Deadlines 4 and 4B; and</p>	<p><b>Robbie Owen</b> on behalf of PoTLL and LGPL responded to the Applicant's summary of the recent chronology of events and submissions commenting that it was helpful to hear. He set out that the ExA had shown great flexibility in changing the examination timetable however (as had been explained in correspondence sent by the two ports to P'INS) the late submission of documents had meant that PoTLL and LGPL were unable to provide a full statement of evidence in advance of the ISH. He explained that the two ports had made submissions at Deadline 4C including a draft report by HRW and would do their best in order to assist the ExA. He set out that while the ports were happy to move on and assist the ExA as far as possible with the examination of the scheme, they reserved their position in respect of making further procedural submissions at the end of the examination.</p> <p>Mr Owen explained that the two ports would like to explore and test the Applicant's proposed approach of using a Structures Exclusion Zone (SEZ) instead of reducing the Order Limits. The two ports wished to explore the pros and cons of such an approach. While the workshops which had been held to date with the Applicant were wide ranging and exploratory, the concept of using a SEZ had not been discussed at them (it was introduced separately). A reduction of the Order Limits was the mitigation sought by the majority of the IPs at Deadline 1 and must be the starting point for discussions.</p> <p>The ports remained to be convinced as to why the use of a SEZ is the appropriate course of action to be taken. The ports accepted that this approach has been used on other schemes (Rampion and Triton Knoll etc.) however that in itself does not justify the use of a SEZ for the proposed development. The Applicant cannot simply look blindly at other schemes without justification being provided for the development in question. If the Applicant does not propose to use the area in the SEZ for</p>

Agenda Item/ Issue	Response
	<p>turbines then the ports suggest that it should be excluded from the Order Limits entirely. Other development in the SEZ area (if required) could be consented through a different process if necessary and would need to be justified. It would, however, be perfectly possible to draft the DCO so that construction could take place outside the (reduced) Order Limits.</p> <p>Allowing a SEZ also opens the possibility that the Applicant could be encouraged to revisit it at a future date and attempt to amend the SEZ given that it would be within the Order Limits. If the area was excluded from the Order Limits altogether then far greater certainty would be provided for the IPs concerned with shipping and navigation issues.</p>
<p>b) Arrangements for notice of and consultation on the SEZ Material Change request.</p>	
<p><b>(3) Applicant's Substantive Position Shipping, Navigation and Maritime Safety post ISH5 and Responses by IPs and Ops</b></p> <p>The ExA will ask the Applicant about the concerns expressed and mitigations sought in ISH5 and subsequent Written Representations, with particular reference to requests from IPs to exclude wind turbine generators and related structures from the red line boundary broadly to landward of the proposed development. The Applicant has made its own SEZ Material Change request for a Structures Exclusion Zone over a smaller area of sea than that sought by IPs.</p> <p>Views will be sought from IPs about:</p> <p>(The ExA will invite the Applicant's to present and explain its SEZ Material Change)</p> <p>(The Applicant will be provided with a right of reply)</p>	
<p>a) The scope of the documentation provided for the SEZ Material Change;</p>	
<p>b) Headline responses to the Applicant's proposal; and</p>	<p><b>Robbie Owen</b> explained that PoTLL and LGPL were pleased to see that the Applicant had been prepared to move its position (through the SEZ). While the SEZ was certainly a concession by the Applicant, at this stage PoTLL and LGPL were unable to comment fully on whether or not it satisfied the ports' concerns in respect of the proposed wind farm extension.</p>



Agenda Item/ Issue	Response
	<p>The NRAA had been developed in order to assess the acceptability of the SEZ and PoTLL and LGPL had concluded that until such time as the assessment provided to support the SEZ was sufficiently robust to determine the impacts on shipping and navigation, they were unable to comment fully on whether the SEZ was acceptable or not.</p> <p>The inadequacies of the NRAA were set out more fully in PoTLL and LGPL's Deadline 4C submissions; however, Mr Owen provided a summary of the headline issues:</p> <ul style="list-style-type: none"> <li>- <b>1. Risk Scoring:</b> LGPL and POTLL's preferred approach is to see a more detailed assessment of risk scores based upon combinations of vessel types and categorisation of vessels which takes into account factors beyond only vessel length (such as draught and handling characteristics). It is understood, however, that the Applicant has used a significantly narrower categorisation of vessel types and combinations. LGPL and POTLL have challenged some of the scores relating to the consequences for stakeholders, which they consider to be significantly understated.</li> <li>- <b>2. The NRAA is seriously deficient on the topic of Future Traffic Growth:</b> the two ports remain of the view that the 10% allowance for future growth applied to the NRA and NRAA is completely insufficient to account for potential future traffic growth to the ports of London (and critically transiting the inshore route and utilising the NE Spit pilot boarding station) in the 'reasonable planning horizon', which the ExA defined in ISH2 Action Points (EV-003) as "+35 years from 2019". In respect of future traffic growth the NRAA is therefore seriously deficient.</li> <li>- <b>3. Shipping Traffic Mix:</b> LGPL and POTLL do not agree with paragraph 22 of the NRAA, which concludes that the data presented in the NRA was representative of the breakdown of vessels using the study area. For example, the assessment in the NRAA now considers vessels of up to 333m LOA which gives some greater comfort with regard to vessel transits via the inshore channel however the ports still believe that the analysis of the breakdown of vessels remains deficient.</li> <li>- <b>4. Pilotage Simulation Study:</b> Whilst the SEZ gives more comfort in respect of the transit of ships via the inshore route, LGPL and POTLL remain unconvinced in respect of pilot boarding operations. In this regard a full bridge simulation study/ real time study is considered necessary in order to inform the NRAA. It is noted that the NRAA (paragraph 163) has also endorsed such a study, but considers it acceptable to defer its completion until the (post DCO) detailed design stage. The ports do not agree with this suggestion and believe that the study is required to inform the ExA's consideration of the application for development consent given the deficiencies with the original simulation study.</li> </ul> <p>Mr Owen went into further detail in respect of the simulation study and explained that the ports did not consider it appropriate for such a key assessment to be carried out post consent. If it was to be carried out post consent then it is assumed that this</p>

Agenda Item/ Issue	Response
	<p>would need to be secured by way of a DCO requirement. Such a study is not the kind of thing that policy indicates should be carried out under a requirement. The simulation study needs to inform the recommendations made by the ExA in their report to the Secretary of State; it is a primary task as opposed to a validating task.</p> <p>Requirements in DCOs should be in accordance with the guidance (see PINS advice note 15 - Drafting DCOs). Paragraph 15, which pertains to requirements, sets out that:</p> <p><i>The law and policy relating to planning conditions, imposed on planning permissions under the TCPA1990, will generally apply when considering Requirements to be imposed in a DCO in relation to the terrestrial elements of a proposed NSIP. Requirements should therefore be precise, enforceable, necessary, relevant to the development, relevant to planning and reasonable in all other respects.</i></p> <p>It is hard to envisage what exactly would happen if the simulation was carried out post consent and showed the wrong result, i.e. that the SEZ was inadequate. The ports were not, therefore, sure how such a requirement would be enforceable. In addition, such a requirement was not necessary as in practical terms such a simulation study could reasonably be carried out within a period of c. 2weeks and could therefore be done well before the end of the examination.</p> <p>The original NRA was informed by a real time navigation simulation study and so the Applicant has conceded that one is required. The ports therefore question why a further one has not been carried out to inform the NRAA. Until this is done, the IPs will remain unable to fully comment on the Applicant's proposals and to determine whether or not the proposed development, revised per the SEZ, is acceptable. In addition, given that the impacts of the project cannot be examined fully without such a study, the ExA is not yet in a position to assess the effects of the application in accordance with what national policy requires. The IPs need to be given confidence in the robustness of the NRAA, there is clearly a pilotage issue and a simulation study should sensibly be carried out to help better understand the risks.</p> <p><b>Vincent Crockett</b> on behalf of PoTLL and LGPL gave a brief technical response explaining that the simulation study needs to be carried out before doing a risk assessment. This would mean that it would be possible to identify areas which are "marginal". This would be an aid to the primary identification of risks which need to be scored. He explained that the NRAA appears to be a "good effort" however it is based on risk scores and it is still not clear how much the original simulation study (which is deficient) was used to inform the NRAA.</p> <p>As set out above, there are a number of deficiencies in the NRAA. The key (and most time critical) analysis at this stage is the simulation study.</p> <p>As set out above in headline terms.</p>
c) Whether any additional analysis is sought	
d) What matters are in headline terms still in	

Agenda Item/ Issue	Response
contention;	
e) The consideration of applications to cross-question technical evidence in substantial contention; and	
f) The allocation of relevant technical evidence to relevant Agenda items.	
<p><b>(4) Policy Considerations</b>  The ExA will ask the Applicant to summarise their current position on policy with regard to NPS EN-3 paragraphs 2.6.147 to 2.6.175 and any other relevant policy or legislative requirements to identify the following:</p> <p>(IPs and OPs with interests in shipping, navigation, ports and channels will be provided with a right of reply. The ExA will invite discussion of the consequences of the policy position and seek views from the Applicant and IPs.)</p>	
<p>(a) To which if any routes approaching London and Sheerness ports does the definition of ‘...recognized sea lanes essential to international navigation...’ apply, with reference to UNCLOS 1967; and could the proposed TEOW development cause interference with their use (2.6.161)?</p>	<p><b>Robbie Owen</b> on behalf of the two ports reiterated the position in respect of policy made in their Deadline 3 and 4 submissions. As requested in the ISH8 Hearing Action Points, PoTLL and LGPL will make a final policy position submission by Deadline 7.</p>
<p>(b) Has site selection (or definition) been made ‘with a view to avoiding or minimising disruption or economic loss to the shipping and navigation industries with particular regard to approaches to ports and to strategic routes</p>	<p>As above.</p>

Agenda Item/ Issue	Response
<p>essential to regional, national and international trade' (2.6.162) and if not, what adverse effects can be quantified and presented in evidence, or what reorganisation of traffic activity might be effected to mitigate disruption or economic loss?</p>	
<p>(c) Has the Applicant taken sufficient measures to 'minimise negative impacts to as low as reasonably practicable (ALARP)' and if not, what additional measures could be implemented (2.6.163)?</p>	<p>As above.</p>
<p>(d) Are there sufficient 'significant concerns over the frequency or consequences of [such] incidents [that] a full Search and Rescue Response Assessment is 'required before the application can be determined' (2.6.164)</p>	<p>This is not within PoTLL and LGPL's remit and thus the two ports have no comment to add.</p>
<p>(e) Would the proposed development 'pose unacceptable risks to navigational safety after mitigation measures have been adopted'? (2.6.165) and if that is considered by regulators to be the case with present proposals, could</p>	<p><b>Robbie Owen</b> explained that this needed to be considered in the ExA's recommendations to the Secretary of State. Unfortunately (and for the reasons set out in more detail above) until the assessment is complete, the ports and other IPs cannot possibly be asked to consider design or risk control measures. He explained that it was hoped that by the end of examination the position will have changed and the ports will be in a position to make submissions on a complete NRA.</p>

Agenda Item/ Issue	Response
<p>additional design or risk controls/mitigation measures be implemented to make risks acceptable?</p> <p>(f) Has the scheme been 'designed to minimise [the] effects on recreational craft and that appropriate mitigation measures, such as buffer areas ...allow for recreational use outside of commercial shipping routes' (2.6.166)?</p> <p>(g) Are mitigation measures possible to 'negate or reduce effects on navigation to a level sufficient to enable the [Secretary of State] to grant consent' (2.6.167)?</p>	<p>There is no evidence to say that the scheme has been designed to minimise the effects on recreational craft and that appropriate mitigation measures, such as buffer areas, are provided/proposed.</p> <p>POTLL and LGPL consider that in theory it is possible that effects on navigation can be reduced to a level sufficient to enable the Secretary of State to grant consent. There may be an acceptable level of reduction of the Order Limits which means that the scheme can proceed in navigational safety terms; however, the ports cannot comment on whether the extent of reduction required will support a viable scheme. The reduction at whatever level must be supported by an acceptable NRAA otherwise it cannot be fully considered by the relevant IPs.</p>
<p>(h) What is the 'extent and nature of any obstruction or danger to navigation, which, (without amounting to interference with the use of [such] sea lanes)...likely to be caused by the development' (2.6.168 and 2.6.161) with regard both to 'the overall effect of development in question and to any cumulative effects of other relevant proposed, consented</p>	<p><b>Robbie Owen</b> set out that PoTLL and LGPL have no comments in respect of cumulative impacts. He reiterated the concern about the use of a SEZ as opposed to an Order Limits reduction and pointed out that other IPs did not seem certain over what could and could not be placed in the SEZ at different times in the scheme's construction and operation.</p>

Agenda Item/ Issue	Response
<p>and operational offshore wind farms' (2.6.169)?</p> <p>(i) Has engagement between the Applicant and maritime navigation stakeholders ensured that solutions have been sought to 'allow [the Thanet OWFE] and navigation uses of the sea to successfully co-exist' (2.6.153) and if not, what additionally needs to be done?</p>	<p>Following the Applicant's initial lack of engagement with PoTLL and LGPL, it has now sought to work with IPs including the two ports in order to try and seek solutions to allow the wind farm extension and navigation uses of the sea to successfully co-exist.</p> <p>The initial engagement has been positive and should the Applicant continue to engage in refining the NRAA then the two ports consider that a solution could be found. This is, however, still very much a work in progress.</p> <p><b>Robbie Owen</b> highlighted that although the IPs had been engaged with the process of refining the NRAA, it was the Applicant's assessment rather than one jointly owned by the IPs. He reiterated that PoTLL and LGPL were not satisfied with the risk scoring as had been set out in their Deadline 4C submissions.</p>
<p>(j) Has the Navigation Risk Assessment (NRA) identified and assessed cumulative and in-combination risks associated with the developments and other developments in the Thames Estuary and its approaches (2.6.157)?</p>	<p><b>(5) Effects on Navigation in the approaches to Thames and Medway Ports</b></p> <p>At ISH2 and ISH5 there was continued dispute between the Applicant and IPs regarding the continued navigability in all MetOcean conditions in the judgment of a prudent master by large commercial vessels of:</p> <ul style="list-style-type: none"> <li>• the inshore passage (Route 4 in the NRA) between TOWF and the Kent coast; and</li> <li>• the NE Spit pilot boarding zone as currently identified.</li> </ul> <p>The Applicant has proposed a Structures Exclusion Zone (Deadline 4 and D4B Material Change Request) and carried out additional consultation with IPs that has attempted to address concerns and disputed definitions of safe sea room. The ExA will ask the regulatory and service bodies including the MCA, Trinity House Lighthouse Services, the shipping industry and IPs responsible for and operating any pilot services, ports, harbours and channels affected by the proposed development to summarise their current position with regard to prudent navigability, with specific attention to the following matters:</p>

Agenda Item/ Issue	Response
<p>(The Applicant will be provided with a right of reply.)            (The ExA will seek to understand the degree to which these matters are capable of resolution in additional Statements of Common Ground (SoCGs) and which of these matters it is now being asked to adjudicate. If necessary, cross-examination of evidence for competing positions will be held now or later in this ISH8)</p>	<p>Note – Agenda items 5 and 6 were covered together with an overall summary being provided by each IP with cross-examination then being allowed. For ease of reference, the response of PoTLL and LGPL is set out below against each Agenda item. <b>Vincent Crockett</b> of HRW provided the majority of the evidence and submissions on behalf of the ports with some input from <b>Robbie Owen</b> and <b>Trevor Hutchinson</b>.</p> <p>Mr Crockett explained that his role at HRW is primarily the management of navigation and real time simulation studies. He explained that he has been assisting PoTLL and LGPL in attending hearings, attending workshops with the Applicant and in producing the HRW Report (a draft of which was submitted by the two ports at Deadline 4C). The assessment of HRW is readily set out in the HRW report and shows that the inshore route is used by a wide range of ships including cruise ships, container ships and fishing vessels and from the work that has been carried out it appears that the route is used as a time saving means. In his submissions Mr Crockett emphasised and built on the points of dispute which had been summarised by Mr Owen at Agenda item 3(c) above.</p> <p>In cross-examination of the Applicant, <b>Mr Owen</b> focused on one key area and asked the Applicant to explain how the 10% growth figure used in the NRA and NRAA had been arrived at. From reading the application documents it was unclear where this figure had come from and there was considered to be little or no justification for arriving at 10%.</p>
<p>(a) Definition of adequate, safe sea room for passage between the array and Elbow cardinal buoy; and between the array and NE Spit cardinal buoy, taking account of extreme MetOcean conditions, speed, turning radii and other relevant characteristics of different vessel types demonstrated to be using these waters individually or in combination with other vessels meeting or</p>	<p>In the absence of carrying out a suitably specified real time navigation simulation study, it is not possible to define the space required other than in broad conceptual terms. The space required will depend on a range of factors including the manoeuvring characteristics of the particular ship(s) under consideration, the prevailing environmental conditions, the ship handler's local knowledge, if any, and whether the ship is meeting or overtaking another ship(s).</p> <p>Theoretical channel width calculations such as those presented in PIANC guidelines will provide widths for a single ship or different combinations of passing ships, usually based on the ship's beam. Such guidelines are not considered relevant because the space available to the west of the wind farm is demonstrably greater than that provided by "artificially created" narrow channels which are usually the primary focus of PIANC and similar guidelines.</p> <p>The Nautical Institute World Ocean Council IALA-sponsored marine spatial planning paper suggests that an individual vessel traffic lane corresponding to twice the length of the design ship provides sufficient sea room or space. To allow for bi directional meeting and overtaking, the paper suggests a corridor width of 8 times the relevant ship length. In the context of the inshore passage to the west of the wind farm this should provide 2 northbound lanes and 2 southbound lanes. These</p>

Agenda Item/ Issue	Response
crossing	lanes are for steady state "flowing" traffic and do not make any allowance for ships encountering operations such as pilot transfers.  For the width between the Elbow cardinal buoy and the wind farm Order limits or SEZ boundary, as appropriate, there is in practical terms no alternative for most ships other than to pass to the east of the elbow cardinal buoy. However, for the NE Spit cardinal buoy, ships of a suitable draught may pass to the west, or the "wrong" side of the cardinal buoy. AIS density plots indicate that several ships pass to the west of the NE Spit cardinal buoy.  As above at 5(a).
(b) Definition of adequate, safe sea room for usability of the NE Spit pilot station in all MetOcean conditions in which it currently operates; sea room being defined by NE Spit bank depth constraints; the limit of Margate Road anchorage; adequate separation from NE Spit Racon buoy and Elbow buoy; and a safe buffer distance from the proposed array extension taking account of any temporary exclusion zone or zones and the effects of crossing traffic including fishing or leisure vessels, wind farm service vessels (WFSVs) and construction or maintenance vessels and vessels leaving or approaching anchorage.	
(c) The case made by the Applicant that the siting of the proposed development and the results of the pilot transfer	The original pilotage navigation simulation study was deficient. The study was carried out using ships that are significantly smaller than those currently using the inshore passage and the NE spit pilot boarding areas. Accordingly, the simulation study underestimated the space required for current ships let alone any future larger ships. This is the primary reason why the NRAA needs to be informed by anew simulation study.



Agenda Item/ Issue	Response
<p>bridge simulation are such as not to need relocation of anything but exceptional pilot transfer operations to the north or north-east of NE Spit buoy. If the IPs and OPs do not agree with that case, on what technical basis is the Applicant's position incorrect?</p>	
<p>(d) Does the case made previously by IPs and OPs that an effect of the siting of the proposed development and consequent constriction between the proposed array boundary and NE Spit Racon buoy or Elbow cardinal buoy may be to make a material increase in masters' decisions to avoid the inshore route (Route 4) still hold good?</p>	<p>It is acknowledged that following the addition of the SEZ to the application there may now be more space available and that subject to simulation studies it is possible that there is sufficient space for safe passage operations. However, the interaction between ships transferring pilots and ships on passage has not been examined in a suitable simulation study. It is therefore not possible to know if masters are likely to be deterred by the potential presence of pilot transfer operations during their passage.</p>
<p>(e) The case made that an additional 1 hour steaming time per ship would be the 'cost' accrued to passages where masters decide to avoid the Inner Channel due to the reduced sea room consequent on development of the Thanet Extension and instead pass to the north of the Thanet Wind</p>	<p>Although it is possible that there will be several masters who will not be deterred by any perception of increased navigational complexity in the inshore route, it is not possible to identify with accuracy which ships are more likely to avoid the inshore route. In broad terms, it is more likely that larger ships would divert but in the absence of a navigation simulation study this cannot be confirmed.</p>

Agenda Item/ Issue	Response
Farm and dip-down to the NE Spit pilot station before continuing passage to the southerly channels into the rivers Thames and Medway?	
<p><b>(6) Detailed Considerations: Navigational Risk Assessment (NRA)</b></p> <p>As a consequence of review of IPs and OPs objections to the NRA at ISH5 and agreements reached in workshops and consultations following ISH5, the NRA Addendum submitted at Deadline 4B on 5 April 2019 concludes:</p> <p><i>"Whilst this assessment has identified that the Baseline and Inherent risks are already at the lower end of the ALARP risk category, the assessment has identified risk control measures that could reduce the risk further, if implemented. The risk controls identified include those identified and applied in the original NRA, those measures that were not applied at the time, and measures identified by the PLA in the 2015 NE Spit but not applied. The latter having been introduced to potentially reduce baseline risk to a level that was aspired to but not implemented at that stage. It is important to note that, if implemented, the PLA risk control measures would reduce the Baseline risk, and therefore the Inherent risk further."</i></p> <p>The ExA will ask the Applicant to make a summary report on the NRA Workshop, associated consultations and the resulting NRA Addendum, with particular coverage of the following:</p> <p>(The ExA will invite discussion of the NRA review process and its conclusions and seek views from IPs and OPs responsible for marine safety and regulation and for operating any pilot services, ports, harbours and channels.)</p> <p>(The Applicant will be provided with a right of reply)</p>	
(a) Could the NRA Addendum concluding statement (quoted above) be clarified?	
(b) To what extent have the navigational risks (predicted to increase as a result of proposed development) been reduced as a result of the proposal of a Structures Exclusion Zone?	The ports do not know to what extent navigational risks have been reduced until a robust assessment is completed (with particular reference to baseline growth in traffic volumes and scoring of stakeholder/property consequences).
(c) How were hazards scrutinised and re-assessed in	There appeared to be a difference of opinion amongst the parties over the level of agreement reached at the workshops. It

Agenda Item/ Issue	Response
collaboration with stakeholders?	<p>should be noted that following the workshops, PoTLL and LGPL reflected on the scoring and raised concerns with the Applicant. Paragraph 153 of the NRAA records the ports' challenge to the scores and it is difficult for the ports to consider the assessment of scores until further clarity is provided by the Applicant.</p> <p>Generally, the time available for the workshops necessarily constrained the collaboration possible and it is reasonable to suggest that in several respects the hazard identification process was unsatisfactory and this is acknowledged by the Applicant. For example, a pilot boat grounding should probably not have been considered as an important hazard in the context of the workshop's primary objectives.</p> <p>The workshop approach used is quite common and standard in the industry, however there were a number of failings. A further example is the treatment of costs which was handled in a difficult way that was hard for IPs to understand. A glancing blow was apportioned a cost of c.£10,000 which seems incredibly low and does not appear to take into account a number of factors, e.g. a RoRo ship's transverse stability is significantly reduced compared with other ships – and little more than a glancing blow could sink it; in addition it was not clear how the assessment of costs related to business or property. A more "scenario based" approach was required at the workshop and unfortunately the scoring became very subjective.</p>
(d) How were the new hazards 1-4 identified and agreed with stakeholders?	<p>As above, the ports did not agree with some scores in respect of stakeholder/property consequences – this is acknowledged by the applicant in the NRAA.</p>
(e) How and by whom were the new hazards 5-18 assessed following the NRA workshop?	<p>It is not clear that new hazards were introduced. The hazards were proposed by the Applicant with the opportunity for workshop participants to suggest deletion of less important hazards.</p> <p>These were assessed by the Applicant based on the principles established during the workshop. This was a matter of time constraints and was not carried out in collaboration.</p>
(f) How were proposed risk controls reappraised and selected for inclusion in the NRA Addendum recommendations?	<p>No new risk controls were identified. Instead reference was made to controls previously proposed by the Applicant and the PLA. This was not carried out in collaboration.</p>
(g) How have societal risks (as a combination of multiple risks with consequences other than safety of life) been assessed to be Tolerable or Acceptable?	<p>Until the assessment of properly and business costs is fully carried out, societal risks cannot be assessed as tolerable or acceptable.</p>

Agenda Item/ Issue	Response
<p>(h) What are the implications of the NRA Addendum 6.2 "...consideration should be given on the basis of the final design of the project to undertaking a full bridge simulation study.</p>	<p>See response on this point above at Agenda item 3(b).</p> <p>One of the major issues with the original simulation study which used the PLA simulator was that the ship sizes were not based on current or future operations. In the original NRA there was a 10% growth figure apportioned however that number was not discussed at the workshops with the Applicant due to time constraints. If a demand profile had been prepared in the original NRA (given the complexity of the Thames Estuary) then that figure could have been more comprehensive and accurate. The NRA should have considered where growth is expected – the ports' position on growth is set out in more detail in the HRW report. The swept path for a large ship needs to be checked and it is also necessary to check simultaneous operations. The lack of further simulation leaves a large gap in the Applicant's evidence.</p> <p>As it stands, the original simulation study forms part of the current process before the examination and it is deficient. What needs to be considered is whether there is adequate space for navigation. It is also clear from reading the Applicant's previous simulation study that it considers that more room is required (see the recommendation at 8.3 that the extent of the permitted anchorage area of the Margate Roads anchorage should be reviewed with a view to relocating it further to the west and creating more navigable water). The two ports are at odds with the Applicant's statement that a further simulation study is not required.</p>
<p>(i) Has any expert review or QA audit of the NRA or the NRA Addendum been carried out independently of the project team and how did the NRA Addendum conclusions take account of such input?</p>	<p>Not as far as the ports are aware.</p>
<p><b>(7) Construction Effects at Sea and on Land</b>  The ExA will review the following:  (The ExA will seek comments from IPs)  (The Applicant will be provided with a right of reply)</p>	
<p>(a) Foundations and trenching: methods, arisings and materials disposal.</p>	

Agenda Item/ Issue	Response
(b) Landfall and cable route options and construction methods.	
(c) Construction and laydown areas.	
(d) Ground investigation, management of contaminated land and ground conditions in and adjacent to Pegwell Bay Country Park, and associated effects to water course and marine water column.	
(e) Substation construction.	
(f) Grid connection and interface with NGET assets	
<b>(8) Biodiversity, Ecology and Natural Environment Considerations</b>	
The ExA will ask the Applicant to summarise the latest position in respect of Habitats Regulations Assessment conclusions, with particular reference to the following:	
(The ExA will seek comments from IPs.) (The Applicant will be provided with a right of reply.)	
(a) Offshore Ornithology:	
i. Red Throated Diver of the Outer Thames Estuary SPA	
a. In-combination displacement effects	
ii. Kitiwake of the Flamborough and Filey Coast	

Agenda Item/ Issue	Response
SPA a. Collision Risk Modelling b. HRA conclusions on in-combination effects iii. In Principle Monitoring Plan iv. Any other matters	
(b) Marine Mammals i. Harbour Porpoise of the Southern North Sea SAC a. HRA conclusions b. Site Integrity Plan ii. Piling Protocol	
(c) Offshore Designated Sites i. Chalk reefs of the Thanet Coast SAC a. the effects of the project alone b. the effects of the project in-combination with other plans and projects	
(d) Inter-tidal saltmarsh habitats i. Saltmarsh Mitigation, Reinstatement and Monitoring Plan ii. Seasonal restriction iii. Thanet Coast and Sandwich Bay SPA and	

Agenda Item/ Issue	Response
<p>Ramsar</p> <p>(e) Goodwin Sands proposed Marine Conservation Zone</p> <ul style="list-style-type: none"> <li>i. Sandwave clearance, dredging and disposal</li> <li>ii. Cable rock protection</li> <li>iii. Cumulative/in-combination effects</li> <li>iv. Pre and post-construction benthic monitoring</li> </ul> <p>(f) Any other environmental and construction matters.</p>	
<p><b>(9) Effects on Fisheries and Fishing</b></p> <p>The ExA will ask the Applicant to review measures taken to mitigate the effects of the proposed development on fishing and fisheries.</p> <p>The ExA will ask bodies responsible for maritime safety, navigation, sea use, fishing and fisheries regulation for their observations on the impacts of the proposed development on fisheries and consequential effects on navigation by fishing vessels in the vicinity of the windfarm.</p> <p>The Applicant will be provided with a right of reply.</p>	

<p><b>(10) Oral Submissions from Fisheries and Fishing Representative Bodies</b>  <b>The ExA will hear bodies representing fisheries and fishermen on:</b></p> <p>(The ExA may extend an opportunity for the Applicant, IPs and Other Persons to raise relevant matters.)          (If necessary, the Applicant will be provided with a right of reply.)</p>	
(a) Effects on navigation and operational safety for fishing vessels.	
(b) Economic and employment effects on the fishing industry.	
(c) Social and economic and employment effects on fishing communities	
(d) General effects on the operation of vessels.	
(e) Effects on access to fishing grounds.	
<p><b>(11) Oral Submissions from Individual Fishermen</b></p> <p>The ExA will hear individual fishermen on:</p> <p>(If necessary, the Applicant will be provided with a right of reply.)</p>	
(a) Effects of the proposed development on the operation of particular fishing vessels and fishing methods.	
(b) Effects of the proposed development on access to particular fishing grounds.	
(c) The ExA may extend an opportunity for the Applicant, IPs and Other Persons to	



<p>raise relevant matters.</p>	<p><b>(12) Mitigation of Effects on Navigation and Commerce</b></p> <p>The ExA will ask the Applicant, IPs and OPs to cross-examine witnesses on evidence presented on contended matters that have not been addressed within the framework provided by earlier agenda items.</p>
<p><b>(13) Any Other Marine and Related Considerations</b></p> <p>The ExA may raise any other consequential topics bearing on Shipping and Navigation topics as is expedient, having regard to the readiness of the persons present to address such matters, including but not limited to:</p> <p>The ExA may extend an opportunity for the Applicant, IPs and Other Persons to raise matters relevant to Shipping and Navigation topics that they consider it should examine.</p> <p>If such matters are raised, the Applicant will be provided with a right of reply.</p>	<p>This Agenda item is covered in PoTLL and LGPL's main Deadline 5 representation.</p>
<p><b>(14) Procedural Decisions (If Required)</b></p> <p>The ExA will review whether there is any need for procedural decisions about additional information or any other matter arising from preceding agenda items.</p> <p>Submissions will be sought from the Applicant and any relevant IPs or Other Persons before determining</p>	<p>(a) Economic and employment effects on marine industries.</p> <p>(b) Social and economic and employment effects on marine communities</p>

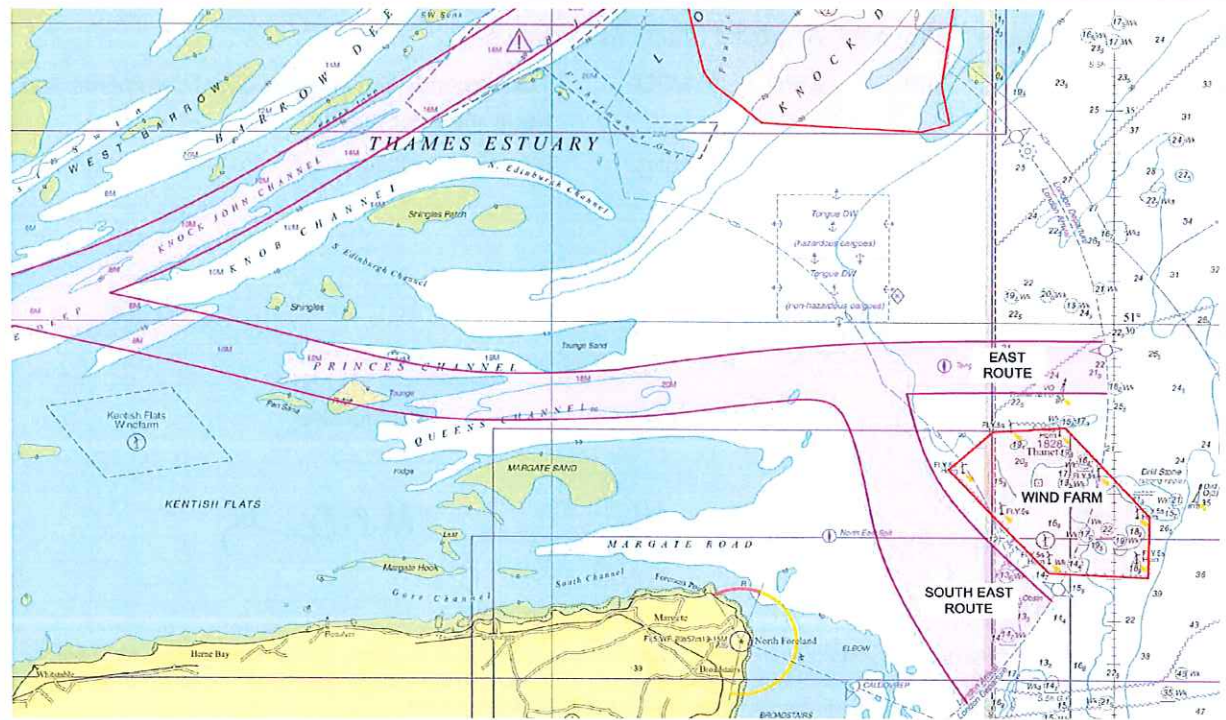
<p>whether a decision may be required, what it might address and whether particular timescales for performance are required.</p> <p>If the ExA determines to make any procedural decisions it may make these decisions orally (subject to confirmation in writing) or may reserve its decisions to be made in writing after the closure of the hearing.</p>	
<p><b>(15) Review of issues and actions arising</b></p>	
<p>To the extent that matters arise that are not addressed in any procedural decisions, the ExA will address how any actions placed on the Applicant, IPs or Other Persons are to be met and consider the approaches to be taken in further hearings, in the light of issues raised in this hearing. A written action list will be published if required.</p>	
<p><b>(16) and (17) Next steps and closure of hearing</b></p>	

**APPENDIX B**  
**HR WALLINGFORD REPORT FINAL**



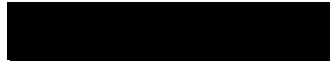
# Thanet Extension Offshore Wind Farm

Support to London Gateway and Port  
of Tilbury on Navigation Aspects



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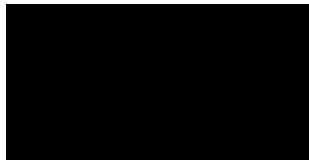
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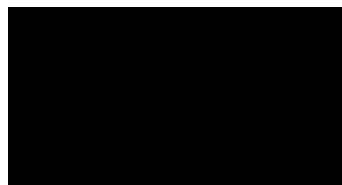
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## Summary

Vattenfall Wind Power Limited is seeking development consent to extend its existing Thanet Offshore Wind Farm (TOWF) by installing additional wind turbines within a new development area adjacent to the existing wind farm creating Thanet Extension Offshore Wind Farm (TEOWF). The proposed extension is currently being examined by a panel on behalf of the Secretary of State. It is likely that the extension of the offshore wind farm will extend into one or more of the shipping routes passing the existing wind farm and/or reduce the space available along shipping routes that currently pass the wind farm, with consequent impacts on the NE Spit pilot station. Accordingly, any navigational impacts arising from the reduced space need to be examined.

Marico Marine, on behalf of Vattenfall, have undertaken a Navigation Risk Assessment (NRA) for the application for development consent for the proposed expansion of TOWF. The NRA is a comprehensive document, however, it has several shortcomings and the reader is led astray regarding the impacts of the TEOWF on the ports located in the Thames Estuary in the assessment. The NRA does not mention or assess the potential impacts of the TEOWF on London Gateway Port or the Port of Tilbury, the two most significant ports on the Thames.

As part of the process of engaging with the examination of the application for development consent, London Gateway Port Limited (London Gateway) and the Port of Tilbury London Limited (Port of Tilbury) appointed HR Wallingford to provide support on particular navigation aspects.

This report, prepared by HR Wallingford, provides a context for considering future growth in ship numbers at London Gateway and the Port of Tilbury for the relevant business sectors, and summarises the relevant traffic levels. The number of vessels using the inshore route between the TOWF and the Kent coast is presented for these two ports, along with the locations at which pilots are embarked or disembarked. The analysis shows that the largest vessels using the inshore route are up to 333m in length, with a 10,000 TEU geometric capacity. The largest vessels using the NE Spit Pilot Station are 333m in length, with over 11,000 TEU geometric capacity.

From a navigation standpoint, extension of the offshore wind farm may require changes to current marine operations including the following:

- For one or more routes, inbound and outbound sailing distances may increase, resulting in additional sailing time, with consequent impacts on time, money, fuel and delays;
- For one or more routes, there may be less space available for pilot transfer operations, with consequent impacts on risk;
- For one or more routes, the reduced space may deter masters from using a particular route in favour of a longer, but safer route, with consequent pressures on congestion on this longer route.

The review of the Vattenfall NRA undertaken by HR Wallingford finds that the NRA does not appreciate the strategic importance of London Gateway Port and the Port of Tilbury, with significant additional committed growth, and it completely fails to consider the potential economic impacts of the TEOWF on the Thames Estuary. No consideration was given to the likelihood of ships of over 11,000 TEU geometric capacity using the inshore route, and this was a shortcoming of the Pilot Transfer Bridge Simulation that has been used to

inform the NRA. The review concludes that the NRA undertaken to support the application for the TEOFWF should be repeated taking into account larger vessels and increased traffic volumes.

Following receipt of comments from several interested parties, Vattenfall has sought to reduce the potential impact on the two ports' marine operations by introducing a structures exclusion zone (SEZ), principally at the north west corner of the expanded wind farm. This SEZ was submitted to the examination at Deadline 4 under reference REP4-018 and an NRA Addendum has been produced by Vattenfall, but did not accompany the submission of the SEZ. In the time available for submission of this report HR Wallingford have not been able to consider whether the additional space provided by the SEZ addresses the primary concerns of the two ports, from a navigation standpoint. Such analysis of the NRA Addendum will be carried out as soon as possible. Nevertheless, it is understood that the NRA Addendum is not based upon real time navigation simulation studies and it is considered that without such studies it will be incomplete.

# Contents

## Summary

1. Introduction	1
2. HR Wallingford	1
2.1. Overview	1
2.2. Navigation services	2
3. Project appreciation	2
4. Selected SE United Kingdom ship call statistics	3
4.1. Overview	3
4.2. Container ship calls	3
4.2.1. Statistics review	3
4.2.2. Growth prospects	4
4.3. RoRo ship calls	5
4.4. London and Medway cargo ship calls	7
5. Maritime access routes to the Port of London	7
5.1. Overview	7
5.2. Northern approach via the Sunk	9
5.3. Eastern approach	9
5.4. South east approach	9
6. AIS and POLARIS data analyses	10
6.1. Overview	10
6.2. POLARIS data	10
6.3. AIS data	10
6.4. Analysis	11
6.5. Port of Tilbury	12
6.6. London Gateway	12
7. London Gateway marine operations	12
7.1. North European context	12
7.1.1. Ship size	12
7.1.2. Average container exchange per call	12
7.2. Terminal capacity and throughput	12
7.2.1. Present terminal capacity	12
7.2.2. Future demand	13
7.3. Ship calls and movements	13
7.4. Ship size	13
7.5. Deep sea transits west of TOWF	14
7.6. Short sea transits west of TOWF	15
7.7. Pilot transfer locations	15
7.7.1. Largest ships using Sunk pilot transfer area	16



7.7.2.	Largest ships using North East Spit pilot transfer area .....	16
<b>8.</b>	<b>Port of Tilbury marine operations .....</b>	<b>17</b>
8.1.	Overview .....	17
8.1.1.	Core port complex.....	17
8.1.2.	Tilbury2 .....	18
8.2.	Ship size.....	21
8.3.	Container ship operations .....	21
8.3.1.	London Container Terminal capacity .....	21
8.3.2.	Deep sea container services .....	21
8.3.3.	Short sea container services .....	22
8.4.	RoRo ship operations.....	23
8.5.	General cargo ships .....	24
8.6.	Bulk carrier operations .....	25
8.7.	Cruise ship operations .....	25
8.8.	Other vessels .....	26
8.9.	Pilotage operations .....	26
<b>9.</b>	<b>Potential impacts on Port of Tilbury .....</b>	<b>27</b>
9.1.	Operations potentially least likely to be affected.....	27
9.1.1.	Non piloted short sea dry cargo ships (< 90m).....	27
9.1.2.	Deeper draught container ships.....	27
9.1.3.	Deeper draught bulk carriers .....	27
9.1.4.	Self-discharging bulk carriers .....	28
9.1.5.	Scrap export bulk carriers.....	28
9.1.6.	Cruises to Norwegian fjords and other northern destinations .....	28
9.2.	Operations that may potentially be affected.....	28
<b>10.</b>	<b>Potential impacts on London Gateway .....</b>	<b>28</b>
<b>11.</b>	<b>Vessel deviation considerations .....</b>	<b>29</b>
11.1.	Overview .....	29
11.2.	Port of Tilbury .....	29
11.2.1.	Passage planning options for impounded dock berths.....	29
11.2.2.	Ship speeds .....	31
11.2.3.	Ship costs .....	32
11.3.	London Gateway .....	33
11.4.	Assessment.....	33
<b>12.</b>	<b>Review of key Applicant submissions .....</b>	<b>33</b>
12.1.	Navigation risk assessment .....	33
12.1.1.	General comments.....	33
12.1.2.	Policy .....	33
12.1.3.	Surveys and AIS analysis to inform the NRA .....	33
12.1.4.	Future marine traffic growth.....	34
12.1.5.	Risk assessment.....	35
12.1.6.	Summary.....	35

12.2. NE Spit Pilot Transfer Simulation Study .....	35
<b>13. Summary and principal conclusions</b> .....	<b>36</b>
13.1. Summary .....	36
13.2. Conclusions .....	36
13.2.1. Navigation risk assessment .....	36
13.2.2. Structure exclusion zone .....	36
<b>14. Recommendations</b> .....	<b>36</b>
14.1.1. Navigation risk assessment .....	36
14.1.2. Structures exclusion zone.....	37
<b>15. References</b> .....	<b>37</b>
<b>Appendices</b> .....	<b>38</b>

## Figures

Figure 4.1: Summary of container ship calls at selected SE UK Ports 2009 to 2017.....	4
Figure 4.2: Summary of Ro Ro ship call statistics for the Ports of London and Medway.....	5
Figure 4.3: Port Freight Statistics for all vessels and container ships (carriers) London and Medway .....	7
Figure 5.1: Principal maritime access routes to Port of London .....	8
Figure 6.1: Gate layout .....	11
Figure 7.1: Distribution of ship size for all transits by length .....	14
Figure 8.1: Overview of Port of Tilbury core complex.....	18
Figure 8.2: Overview of Tilbury 2 site location.....	19
Figure 8.3: Tilbury2 Site development plan .....	20
Figure 8.4: Distribution of ship size for all transits by length .....	21

## Tables

Table 4.1: Summary of container ship calls at selected SE UK Ports 2009 to 2017.....	6
Table 4.2: Summary of Ro Ro ship call statistics for the Ports of London and Medway .....	6
Table 5.1: Ruling depths on northern approach via the Sunk .....	9
Table 5.2: Ruling depths on eastern approach.....	9
Table 7.1: Ship call distribution December 2017 to November 2018 .....	13
Table 7.2: Ship size distribution from December 2017 to November 2018 .....	14
Table 7.3: Deep sea container ship transits inbound through AIS Gate 1 .....	15
Table 7.4: Short sea container ship transits inbound through AIS Gate 1 .....	15
Table 7.5: Pilot boarding transfers by boarding area for London Gateway .....	16
Table 7.6: Largest ships using NE Spit boarding area, December 2017 to November 2018.....	16
Table 5.1: Tilbury lock limiting dimensions .....	17
Table 8.2: Selected deep sea container ship transits inbound through AIS Gate 1 .....	22
Table 8.3: Ten largest container ship transits inbound through AIS Gate 1.....	22
Table 8.4: RoRo ship inbound transits through AIS Gate 1.....	23
Table 8.5: Nine largest general cargo ship transits through AIS Gate 1 .....	24
Table 8.6: Nine most frequenting cargo ship transits through AIS Gate 1 .....	24
Table 8.7: Bulk carrier transits through AIS Gate 1 .....	25

Table 8.8: Cruise ships inbound transits through AIS Gate 1.....	25
Table 8.9: Other vessels inbound transits through AIS Gate 1 .....	26
Table 8.10: Port of Tilbury pilotage transfers for inbound vessels.....	26
Table 11.1: Route options for Tilbury dock berths for south and south east origins and destinations .....	30
Table 11.2: Principal implications of route selection decisions.....	31
Table 11.3: Selected ship speeds for Port of Tilbury .....	32
Table 11.4: Selected container ship charter rates for Port of Tilbury .....	32

# 1. Introduction

Vattenfall Wind Power Limited (the Applicant) is seeking development consent to extend its existing Thanet Offshore Wind Farm (TOWF) by installing additional wind turbines within a new development area adjacent to the existing wind farm creating Thanet Extension Offshore Wind Farm (TEOWF). The proposed extension is currently being examined by a panel on behalf of the Secretary of State. It is likely that the extension of the offshore wind farm will extend into one or more of the shipping routes passing the existing wind farm and/or reduce the space available along shipping routes that currently pass the wind farm, with consequent impacts on the NE Spit pilot station. Accordingly, any navigational impacts arising from the reduced space need to be examined.

As part of the process of engaging with the examination of the application for development consent, London Gateway Port Limited (London Gateway) and the Port of Tilbury London Limited (Port of Tilbury) have appointed HR Wallingford to provide support on particular navigation aspects.

## 2. HR Wallingford

### 2.1. Overview

HR Wallingford is an independent company, established for over 70 years, offering specialist consultancy and applied research services in civil engineering and environmental hydraulics to clients worldwide. The company has gained an international reputation for a scientific and engineering excellence, and has no vested interest in any particular methods of solving problems, only in finding suitable solutions.

With a staff of over 220 including engineers, scientists, mathematicians, technicians and support staff, a wide range of skills and expertise is available. HR Wallingford is the UK national centre for civil engineering hydraulics. Our fields of activity cover:

- Navigation and vessel movement;
- Dredging and disposal;
- Ports and harbours;
- Marine and coastal and structures including locks;
- Estuary processes and management;
- Coastal processes and management;
- Environmental modelling and assessment;
- Irrigation and water resources;
- Pipelines and outfall engineering;
- River basin management.

HR Wallingford has a specific team of engineers dedicated to providing practical engineering services to support the specialist technical capabilities for which HR Wallingford is renowned. The team's background in consulting engineering and construction means that it has extensive experience in ports, coastal and tidal

engineering projects. This team works closely with both end client and consulting engineers and architects to develop optimum project solutions. Through our continuing research projects and close contact with government and expert organisations, our work represents best current practice and is consistent with current and imminent national and international legislation. This coupling of practical knowledge with the range of technical skills available at HR Wallingford means that we can provide a dependable, independent and rounded service to meet our client's needs.

To enable us to offer these supporting services we give advice at all stages of project development, drawing upon the existing specialist technical capabilities and combining these with the 'hands-on' experience of actual engineering projects.

## 2.2. Navigation services

HR Wallingford provide a wide range of navigation services including the following:

- Desk based navigation assessments;
- Risk assessments;
- Real and fast time navigation simulation from centres in the United Kingdom and Australia;
- Port operational simulation studies.

## 3. Project appreciation

From a navigation standpoint, extension of the offshore wind farm may require changes to current marine operations including the following:

- For one or more routes, inbound and outbound sailing distances may increase, resulting in additional sailing time;
- For one or more routes, there may be less space available for pilot transfer operations;
- For one or more routes, the reduced space may deter masters from using a particular route in favour of a longer, but safer route.

The consequences of the changes may include the following:

- Extended pilotage times for certain ship/route combinations;
- Additional ship charter/operational costs;
- Reduced tidal windows, particularly for Port of Tilbury impounded dock berths;
- Increased vessel traffic density on one or more routes, with associated increased risk of collision or grounding;
- Relocation of pilot boarding areas resulting in increased operating costs;
- Potential delays to pilot boarding or landing (especially in bad weather);
- Potential increase in pilot over-carriage occurrences;
- Acquisition of new, higher specification, pilot boats as a result of relocation of pilot transfer areas;
- Recruitment of additional pilots if required;
- Possible increased berth occupancy as a result of increased sailing time with the consequent loss of berth or terminal capacity.

## 4. Selected SE United Kingdom ship call statistics

### 4.1. Overview

This section provides a context for considering future growth in ship numbers at London Gateway and the Port of Tilbury for the relevant business sectors.

The ports of Felixstowe, Southampton and Medway (Thamesport) are included for reference because, prior to the development of London Gateway in 2013, they were the only ports in the United Kingdom with deep sea berths capable of accommodating the larger container ships deployed on Asia to Europe arterial routes. Carriers effectively had a choice between these 3 ports or not calling at a United Kingdom port. Deep sea container services were discontinued at Thamesport in 2013.

### 4.2. Container ship calls

#### 4.2.1. Statistics review

Table 4.1 and Figure 4.1 summarise calls by fully cellular container ships at the ports of London, Medway, Felixstowe and Southampton between 2009 and 2017. Coincidentally, the data covers a 4 year period from 2009 to 2012, before the opening of London Gateway in 2013, and a further 4 year period from 2014 to 2017, after the opening of London Gateway. The calls may be put in context by noting that the Thanet wind farm was officially opened in September 2010.

Prior to the opening of London Gateway in 2013, the Port of Tilbury provided the principal container terminal capacity within the Port of London. Table 4.1 shows that the Port of Tilbury generated an average of 1,040 ship calls, or 2,080 movements per annum in the period 2009 to 2012. This is equivalent to almost 6 movements per day.

In 2013, the year in which the first ship called at London Gateway, the number of container ship calls reduced to 928, the lowest number of calls per annum in the time series. The table shows that in the 2 years following the opening of London Gateway, there was no significant increase in the number of container ship calls within the Port of London and not until 2016 is there a significant increase in the number of calls per annum. The 1,931 calls per annum, or almost 11 movements a day, recorded in 2017 represents an 82% increase over the 1,061 calls recorded in 2009. As the Department for Transport statistics report at a port rather than terminal level, it is not possible to subdivide the 1,931 calls between the Port of Tilbury and London Gateway.

This significant increase in calls within the Port of London should be seen in the context that the number of calls per annum for the ports of London, Medway, Felixstowe and Southampton combined has remained effectively static in the period between 2009 and 2017, primarily because of the introduction of larger ships. Separately, several services have transferred from the Port of Felixstowe to London Gateway, resulting in a significant increase in the number of calls within the Port of London. Significantly, in 2017, the Port of London received almost 20% more container ship calls than Felixstowe.

The most significant decline in container ship calls within the Thames Estuary was recorded for Medway and, in particular, Thamesport. The Thamesport terminal is reported to now handle only short sea ships.



Figure 4.1: Summary of container ship calls at selected SE UK Ports 2009 to 2017

Source: United Kingdom Department for Transport

#### 4.2.2. Growth prospects

##### London Gateway

London Gateway has seen a rapid growth in throughput over its existing 3 berths in the last 2 years or so, primarily as a result of securing calls by large ships deployed on the Asia to Europe arterial routes and further strong growth is expected. In this respect, the stated capacity of London Gateway is about 3.5 million TEU per annum for the full, consented development of 6 berths, with theoretically the 3 existing berths providing 1.75 million TEU capacity.. Throughput in 2018 was reported as 1.3 million TEU.

This growth is expected to be generated by a range of factors including:

- Growth in the United Kingdom economy, noting uncertainties caused by Brexit;
- further transfer of calls from other ports in the United Kingdom;
- Transfer of calls from continental Europe;
- Increased transshipment.

##### Port of Tilbury

For the Port of Tilbury, it is expected that growth would be generated by:

- Again, growth in the United Kingdom economy;
- Increased intra-European volumes;
- Deployment of larger ships on the deep sea services calling at Tilbury within the constraints of the ship size that can be handled at Tilbury (which is relatively large at about 10,000 to 11,000 TEU geometric capacity).

### 4.3. RoRo ship calls

Table 4.2 and Figure 4.2 summarise calls by RoRo ships at the ports of London and Medway between 2009 and 2017.



Figure 4.2: Summary of Ro Ro ship call statistics for the Ports of London and Medway

Source: United Kingdom Department for Transport

A key driver of the Tilbury2 development is to provide additional RoRo capacity outside the impounded dock. The volume of RoRo units handled at Tilbury 2 is expected to be approximately 250% higher than the existing volumes handled at impounded dock RoRo berths.





Table 4.1: Summary of container ship calls at selected SE UK Ports 2009 to 2017

Port	2009	2010 <sup>1</sup>	2011	2012	2013 <sup>2</sup>	2014	2015	2016	2017
London	1,061	996	1,061	1,042	928	1,121	1,175	1,620	1,931
Medway	523	599	734	720	686	734	696	188	207
<b>Subtotals</b>	<b>1,584</b>	<b>1,595</b>	<b>1,795</b>	<b>1,762</b>	<b>1,614</b>	<b>1,855</b>	<b>1,871</b>	<b>1,808</b>	<b>2,138</b>
Felixstowe	2,450	2,332	2,442	2,234	2,102	1,960	1,776	1,663	1,614
Southampton	774	833	767	648	701	972	1,091	1,164	1,126
<b>Totals</b>	<b>4,808</b>	<b>4,760</b>	<b>5,004</b>	<b>4,644</b>	<b>4,417</b>	<b>4,787</b>	<b>4,738</b>	<b>4,635</b>	<b>4,878</b>

Source: United Kingdom Department for Transport

Notes: 1 Thanet wind farm opened in 2010

2 London Gateway opened in 2013

Table 4.2: Summary of Ro Ro ship call statistics for the Ports of London and Medway

	2009	2010	2011	2012	2013	2014	2015	2016	2017
London	2,922	2,992	3,114	2,753	2,621	2,682	2,756	2,806	2,676
Medway	281	248	322	238	197	322	215	188	186
<b>Totals</b>	<b>3,203</b>	<b>3,240</b>	<b>3,436</b>	<b>2,991</b>	<b>2,818</b>	<b>3,004</b>	<b>2,971</b>	<b>2,994</b>	<b>2,862</b>

Source: United Kingdom Department for Transport

## 4.4. London and Medway cargo ship calls

Figure 4.3 shows vessel arrivals per year according to the Department of Transport Port Freight Statistics for London only and for London plus Medway combined. It also shows container ship arrivals per year.

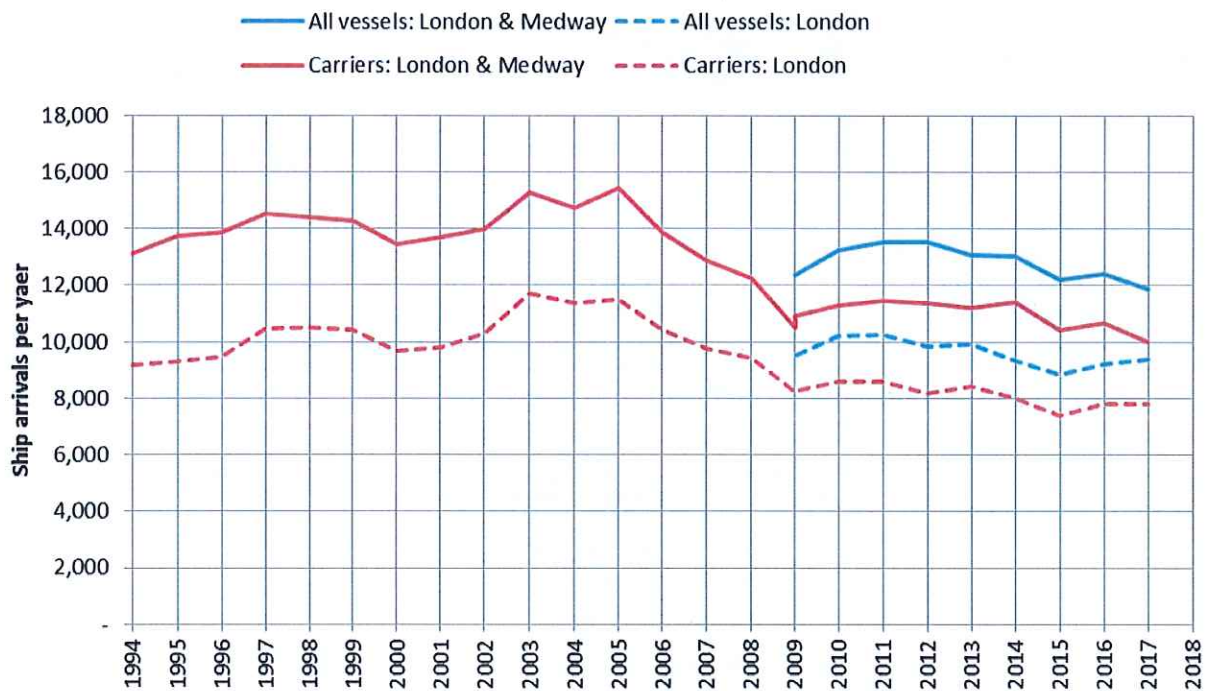


Figure 4.3: Port Freight Statistics for all vessels and container ships (carriers) London and Medway

Source: Department for Transport: Port Freight Statistics 2017<sup>5</sup>

## 5. Maritime access routes to the Port of London

### 5.1. Overview

An overview of the principal maritime access routes to DP World London Gateway (London Gateway) and Port of Tilbury is presented on United Kingdom Hydrographic Office Chart 8157 "Port Approach Guide Thames Estuary". This shows the following alternative routes, working in a clockwise direction from the north (Figure 5.1):

- Approach from the north east, from the Sunk area to the Black Deep, passing along the north western side of the existing London Array Wind Farm, and inward to the Thames Estuary and London Gateway;
- Approach from the east, passing to the north of the Thanet North cardinal and to the south of the Tongue anchorage, and inward to the Princes Channel to London Gateway and Port of Tilbury (i.e. passing to the east and north of the TOWF);

- Approach from the south east, passing to the east of the NE Goodwin and Elbow cardinals, and hence, inshore to the south and west of the TOWF.

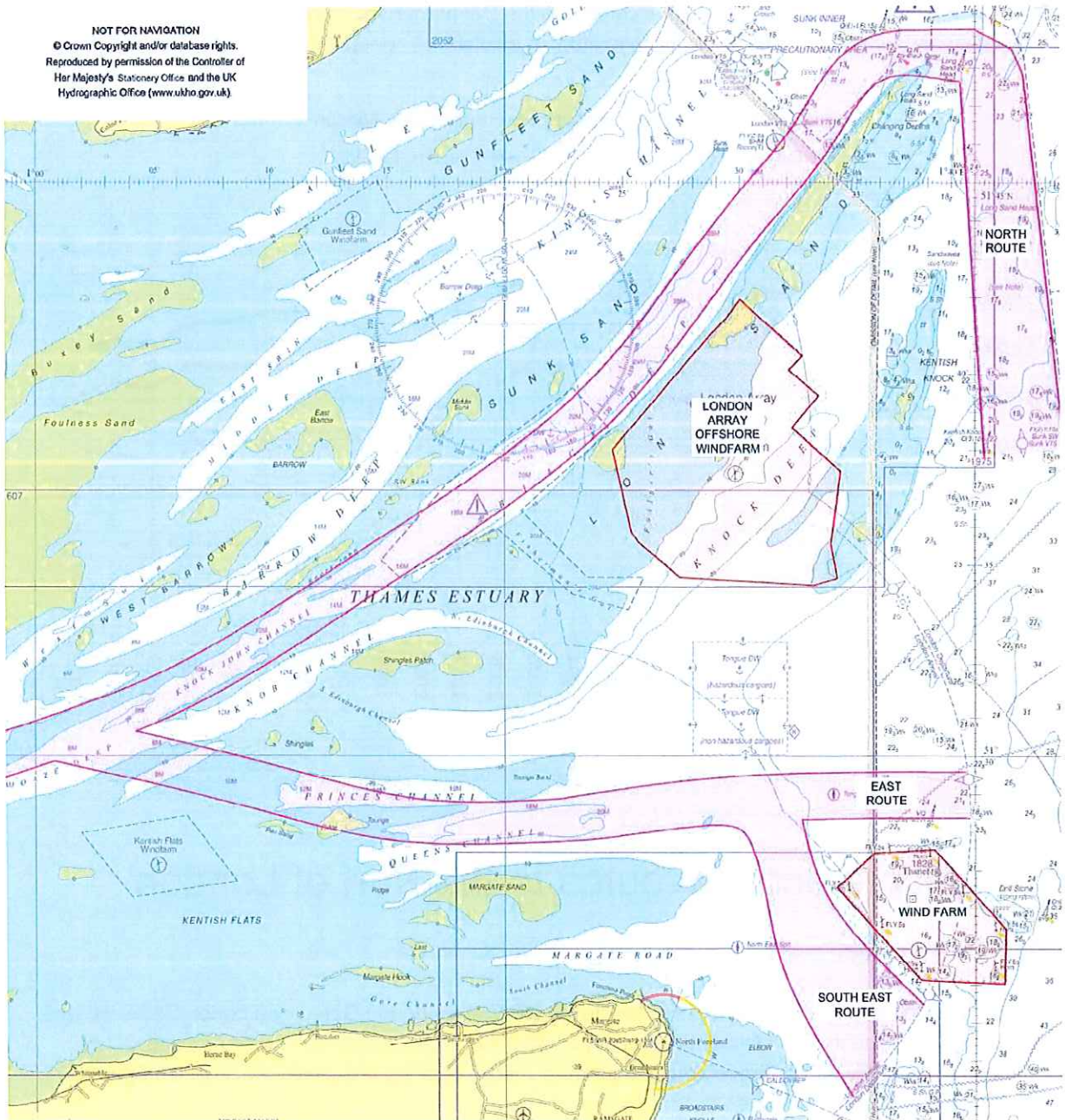


Figure 5.1: Principal maritime access routes to Port of London  
Source: Admiralty Chart 1610 "Approaches to the Thames Estuary"

## 5.2. Northern approach via the Sunk

This is the deep water approach to the Port of London and is effectively unaffected by expansion of the TOWF. Current ruling depths on the route based on Reference 1 are summarised in Table 5.1.

Table 5.1: Ruling depths on northern approach via the Sunk

Location	Ruling depth (m CD)	Comments
Sunk Pilots SHM	15.4	
Black Deep Middle	16.0	
Knock John Shoal	14.4	Inner and outer limits
Oaze Buoy	16.2	
West Oaze Buoy	14.5	
Sea Reach	13.8	Minimum value
London Gateway	14.2	
Lower Hope Point Shoal	9.3	
Coal House Shoal	9.2	
Diver Shoal	9.7	
Tilburyness shoal	9.1	

Source: Reference 1

The table shows that on the basis of a 15% gross under keel clearance, there is currently full tidal access to London Gateway with ships with a static draught of up to 12m. Tidal benefit is required for a ship with a draught of 12m to proceed to the Port of Tilbury.

## 5.3. Eastern approach

This approach passes to the north of the TOWF and uses the Princes Channel. Current ruling depths on the route based on Reference 1 are summarised in Table 5.2.

Table 5.2: Ruling depths on eastern approach

Location	Ruling depth (m CD)	Comments
NE Spit Pilots	9.6	
Princes Channel Bar	8.1	Deep water route
Shivering sands Shoal	8.2	

Source: Reference 1

The table shows that on the basis of a 15% gross under keel clearance, there is currently full tidal access to London Gateway and the Port of Tilbury for ships with a static draught of up to 7m.

## 5.4. South east approach

This route passes to the west of the TOWF and provides the shortest route to and from the Princes Channel. The ruling depths are the same as those summarised in Section 5.3.

## 6. AIS and POLARIS data analyses

### 6.1. Overview

The two main stations for picking up pilots for the larger vessels inbound for the Port of London are the Sunk Pilot Station, to the north, and the NE Spit Pilot Station, inshore of the TOWF. A further station, the Tongue, lies to the north and west of the TOWF, but this site is hardly used, with the NE Spit being the preferred inshore pilot station owing to its shorter pilot boat transit from shore and its less exposed location.

The Port of London Authority (PLA) supplied HR Wallingford with a year of AIS (Automatic Identification System) and POLARIS (Port of London River Information System) data for the period 1/12/17 to 30/11/18.

### 6.2. POLARIS data

The POLARIS data provided the full record of pilotage inbound to and outbound from the Port of London. The POLARIS data identified ship details, the location at which the pilot came aboard and the destination of the ship. So, for inbound trips it can be determined whether pilots were picked up at the Sunk or NE Spit, for example. For outbound trips the records did not always identify where pilots are landed.

### 6.3. AIS data

The AIS data supplied by the PLA included two "gates", one inshore of the Thanet Offshore Wind Farm (TOWF) and the other extending eastward to seaward of the TOWF. The AIS data thus covered a subset of the inbound and outbound traffic from the Port of London. It (Gate 1) covered all vessels recorded by AIS inbound or outbound using the inshore route between the TOWF and the Kent coast (comparable to Gate A of the Marico Marine analysis). It (Gate 2) covered vessels inbound from the south using the Princes Channel, Fisherman's Gat or heading up to the Sunk to use the deepest water approach. The gate did not capture vessels coming across the North Sea to the north of Gate 2. The approximate gate layout is shown in Figure 6.1.



Figure 6.1: Gate layout

Source: Admiralty Chart 1610 "Approaches to the Thames Estuary"

## 6.4. Analysis

The AIS and POLARIS data sets have been processed to provide subsets of vessels inbound/outbound for the Port of Tilbury and for London Gateway. From the POLARIS data, the locations for the pick-up of pilots were readily identified. From the AIS data the number of vessels making passage inshore of the TOWF can be determined. By comparison of the POLARIS data and the AIS data, the number of vessels using the inshore channel that are piloted can also be established.

Summary findings are provided in the following sections.

## 6.5. Port of Tilbury

In the year ending 30 November 2018, 534 ships inbound for the Port of Tilbury used the inshore route.

For Port of Tilbury ships (inbound and outbound) there were a total of 3,127 recorded piloted movements. Of the inbound movements 754 included picking up a pilot at the NE Spit. Approximately 50% of the inbound piloted ships to the Port of Tilbury pick up a pilot at the NE Spit.

## 6.6. London Gateway

In the year ending 30 November 2018, 79 inbound ships used the inshore route.

There were a total of 2,134 recorded piloted movements, inbound and outbound and of the inbound movements, 160 included picking up a pilot at the NE Spit. Approximately 15% of the inbound piloted vessels to London Gateway pick up a pilot at the NE Spit.

# 7. London Gateway marine operations

## 7.1. North European context

### 7.1.1. Ship size

Ships with a container capacity of 14,000 TEU or more account for more than 25% of the container throughput handled in North European ports (Reference 2). The same reference reports that the ports of Southampton and Felixstowe are ranked second and third in the world, after the port of Yangshan in China, in terms of the largest average size of container ship handled. The average ship capacities for Southampton and Felixstowe are noted as 9,919 TEU and 9,105 TEU, respectively. This large average size may be readily appreciated by noting the location of these ports on the arterial Asia to Europe route, as is London Gateway, as discussed in Section 4.

### 7.1.2. Average container exchange per call

The IHS-Markit research (Reference 2) also indicates that the average container ship call size or exchange, expressed in terms of crane moves, for container terminals in Northern Europe, increased from 970 moves in the first half of 2016 to 1,165 moves in the first half of 2017, an increase of about 20%. Correspondingly, the total number of container ship calls declined significantly, from 13,156 in the first half of 2016 to 10,711 in the first half of 2017. The same reference suggests that a key factor underlying these changes is the growth in the geometric capacity of container ships handled in Northern European container terminals.

## 7.2. Terminal capacity and throughput

### 7.2.1. Present terminal capacity

Public domain information indicates that the terminal has a stated capacity of 3.5 million TEU per annum when fully developed. In the 2018 calendar year, throughput equalled approximately 1.3 million TEU.

### 7.2.2. Future demand

At present there are three berths operational at London Gateway and a further three berths are yet to be developed. It is difficult to predict with precision the number of vessel movements that will be generated when terminal throughput reaches a level of 3.5 million TEU per annum. This is because, as discussed in outline in Section 4, expected vessel movements are likely to depend on several factors, including the mix of services calling at the terminal.

## 7.3. Ship calls and movements

Analysis of the PLA's POLARIS database for pilotage acts for the period 1 December 2017 to 30 November 2018, indicates that London Gateway received 1,069 arrivals and 1,065 departures during this period. This represents an average of approximately 178 movements per month, or just under 6 movements per day. Separately, Table 4.1 indicates that there were 1,931 container ship calls into the Port of London in 2017, so it is possible that the Port of Tilbury continued to account for around 900 container ship calls per annum in 2017 and 2018.

It is important to note that large ship movements are often tidally constrained and, therefore, average movement data needs to be considered with caution. For example, Estuary Services Limited (ESL) report they have carried out pilot transfers for 6 ships at the North East Spit pilot station in a relatively short time period.

Table 7.1 shows the distribution of ship calls and movements throughout the period for which POLARIS records are available. The table shows a generally even distribution of calls throughout the period, although there is evidence of slightly increased shipments leading up to Christmas 2018 and slightly reduced activity after Christmas 2017.

Table 7.1: Ship call distribution December 2017 to November 2018

Period	Number of calls	Number of movements
December 2017 to February 2018	258	514
March 2018 to May 2018	278	560
June 2018 to August 2018	264	523
September 2018 to November 2018	269	537
<b>Totals</b>	<b>1,069</b>	<b>2,134</b>

Source: PLA POLARIS data

## 7.4. Ship size

Table 7.2 shows that ship size distribution was reasonably constant during the period from December 2017 to November 2018. More importantly, it underlines the importance of ensuring that the Thames Estuary and London Gateway are able to continue to receive calls from the largest container ships currently in operation and likely to be in operation in the future. In this respect, ships with a geometric capacity of 23,000 TEU will start to enter service in 2019 and/or 2020.



Table 7.2: Ship size distribution from December 2017 to November 2018

Period	Ship geometric capacity (TEU)		
	Average	Minimum	Maximum
December 2017 to February 2018	6,314	660	20,568
March 2018 to May 2018	6,603	660	19,600
June 2018 to August 2018	6,570	632	19,600
September 2018 to November 2018	6,416	819	20,150

Source: PLA POLARIS database and HR Wallingford research

Figure 7.1 illustrates the distribution of ship size by length for London Gateway transits recorded on the PLA POLARIS database. A significant number of transits recorded (31%) were by vessels falling within the range of 290 to 300m LOA, and 26% of all transits were by vessels above 300m LOA.

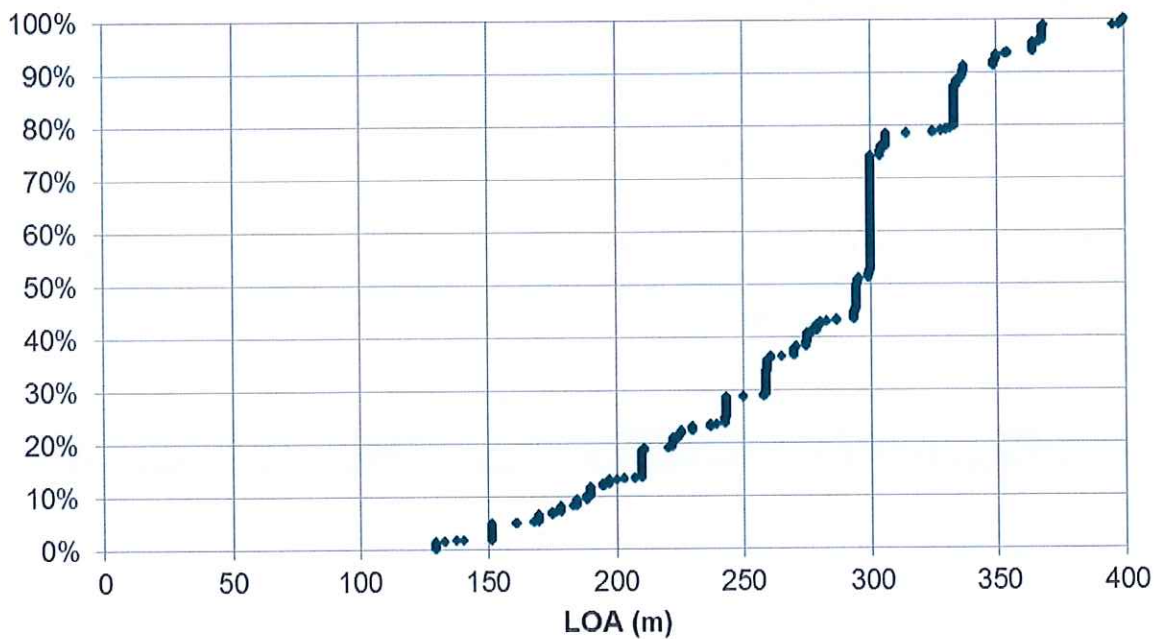


Figure 7.1: Distribution of ship size for all transits by length

Source: PLA POLARIS database

## 7.5. Deep sea transits west of TOWF

Table 7.3 shows the 5 largest and the 5 most frequently transiting deep sea transits inbound through AIS Gate 1. The data as a whole suggests that London Gateway generated at least 51 deep sea transits inbound through Gate 1 (i.e. to the west of TOWF), providing a total geometric capacity of at least 139,000 TEU. TEU data was assumed from readily available data for the considered ships.

A full table of transits is supplied in Appendix A.

Table 7.3: Deep sea container ship transits inbound through AIS Gate 1

Ship	Length (m)	TEU	Number of transits
<b>Largest (by TEU):</b>			
Cap San Raphael	333	9,814	1
MSC Chloe	300	9,400	1
CCNI Andes	300	9,000	1
Al Bahia	306	4,898	1
Rotterdam Express	294	4,890	1
<b>Most frequent:</b>			
Marfret Guyane	170	1,713	8
CMA CGM St. Laurent	190	2140	7
Marfret Marajro	170	1691	6
CMA CGM Marseille	190	2140	5
CMA CGM Brazil	189	2339	3

Source: Port of London Authority Gate 1 AIS records Pilotage operations

## 7.6. Short sea transits west of TOWF

Table 7.4 shows all short sea container ship transits inbound through AIS Gate 1.

The data as a whole suggests that London Gateway generated at least 28 short sea transits inbound through Gate 1 (i.e. to the west of TOWF), providing a total geometric capacity of at least 25,000 TEU. TEU data was assumed from readily available data for the considered ships.

A full table of vessel transits is supplied in Appendix B.

Table 7.4: Short sea container ship transits inbound through AIS Gate 1

Ship	Length (m)	TEU	Number of transits
Helena Schepers	152	1036	10
Wes Carina	153	1036	7
Helena Schepers	129	698	6
Ice Crystal	129	700	5

Source: Port of London Authority Gate 1 AIS records Pilotage operations

## 7.7. Pilot transfer locations

Table 7.5 summarises the pilot transfers which took place by transfer area in the period 1 December 2017 to November 2018.

Table 7.5: Pilot boarding transfers by boarding area for London Gateway

Pilot boarding area	No. of transfers	No. of individual ships	Transfers per ship
Sunk	877	276	3.2
North East Spit	160	63	2.5
Dover	14	13	1.1
NE Goodwin	12	12	1
"Europe"	4	4	1
Other	2	2	1
<b>Total</b>	<b>1,069</b>		

Source: PLA POLARIS database

The table shows that the most important transfer area for London Gateway is the Sunk, with 877 transfers taking place, or about 82% of the total transfers. The North East Spit is the second most used transfer area, with 160 transfers, or about 15% of the total transfers.

It was noted that the "Europe" transfers all took place in March 2018, suggesting that these pilots joined inbound ships in continental European ports because of the particularly adverse weather conditions that prevailed in early and mid-March 2018.

#### 7.7.1. Largest ships using Sunk pilot transfer area

The largest container ships using the Sunk boarding area have a geometric capacity in excess of 20,000 TEU.

#### 7.7.2. Largest ships using North East Spit pilot transfer area

Table 7.6 summarises the details of the 8 largest, by length, container ships to have used the North East Spit boarding area in the period December 2017 to November 2018. The largest ships recorded were the 333m long "Valparaiso Express" and "Guayaquil Express", with geometric capacities of 11,519 TEU.

Table 7.6: Largest ships using NE Spit boarding area, December 2017 to November 2018

Ship	Length (m)	Capacity (TEU)
Valparaiso Express	333	11,519
Guayaquil Express	333	11,519
MSC Yashi B	330	11,000
Al Bahia	306	7,323
MSC Barbara	304	6,402
CCNI Andes	300	9,000
MSC Chloe	300	9,400
MSC Giselle	300	9,400

Source: PLA POLARIS database December 2017 to November 2018

## 8. Port of Tilbury marine operations

### 8.1. Overview

#### 8.1.1. Core port complex

An overview of the existing, core Tilbury port complex is shown in Figure 8.1. The image shows that the complex is dominated by the original impounded docks, which are accessed from the river through a single lock. The image also shows the more recent container and dry bulk river berths, which have been developed upstream of the lock. In the bottom right hand corner of the image is the original Tilbury landing stage, now the London Cruise Terminal, and a relatively recent RoRo berth.

In broad terms, ships calling at the core complex may be considered in terms of 2 groups, as ships with dimensions that enable them to transit the lock and those that are too large to transit the lock and therefore call at the river berths. Table 5.1 summarises the limiting dimensions of ships able to transit the lock.

Table 5.1: Tilbury lock limiting dimensions

Parameter	Value	Notes
Length (m)	262.1	Depends on tug configuration
Beam (m)	32.3	Original Panamax beam
Draught (m)	11.4	Typical maximum draught is about 10.5m

Source: Port of Tilbury, Port of London Authority

Excluding draught constraints, for example Diver Shoal as discussed in Section 5, the key constraint for the river berths is ship length. The largest container ship to have called at the river berths is reported to have been the partially laden, Sovereign Maersk (Reference 3). This ship has a length of 347m and a geometric capacity of 10,457 TEU, significantly higher than the capacity noted in Reference 3. More recently, the NeoPanamax container ships the 333m long "Cap San Lorenzo" and the 300m long "MSC Sofia Celeste" have called at the river berths. These ships have geometric capacities of 9,814 TEU and 8,800 TEU, respectively.

Downstream of the lock, the largest cruise ship to have called at the London Cruise Terminal is reported to be the "Mein Schiff 3" (Reference 4). This ship has a length of 295m. In principle, there is no reason why significantly larger (longer) cruise ships cannot be handled at the terminal, for example up to "Oasis of the Seas" class ships, with a length of 360m.



Figure 8.1: Overview of Port of Tilbury core complex

Source: Bing Maps

### 8.1.2. Tilbury2

The Tilbury2 development was granted development consent on 20 February 2019. Tilbury2 will result in a significant increase in the total tonnage handled through the combined operation, with the Tilbury2 facility being a dedicated RoRo terminal and CMAT (Construction Materials and Aggregates Terminal). Tilbury2 started construction immediately when the DCO came into force, on 13 March 2019. The location of Tilbury2 is shown in Figure 8.2 and the development plan is shown in Figure 8.3. The port development is based on redevelopment of a former coal fired power station site and its associated coal handling jetty.

When fully operational, Tilbury 2 will have a capacity of approximately 1.6 million tonnes (CMAT) and 500,000 TEU (RoRo) (equivalent to approximately 8.75 million tonnes).



Figure 8.2: Overview of Tilbury 2 site location

Source: Bing Maps

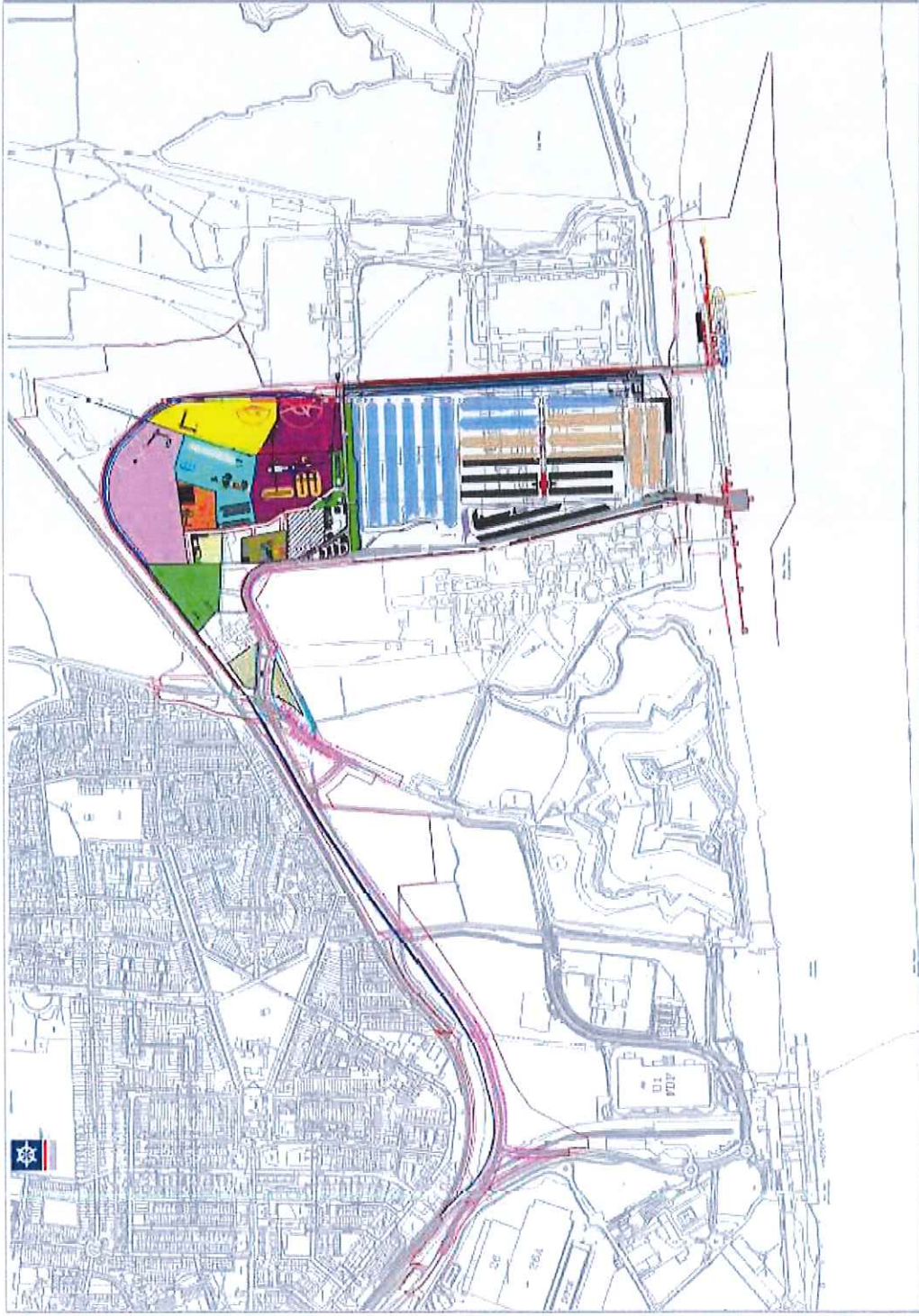


Figure 8.3: Tilbury2 Site development plan

Source: Port of Tilbury Limited

## 8.2. Ship size

Figure 8.4 illustrates the distribution of ship size by length for Port of Tilbury transits recorded on the PLA POLARIS database. It shows that 18.1% of transits were by vessels under 90m in length, which represents a threshold where pilotage requirements are reduced. Few transits recorded were by vessels above 240m.

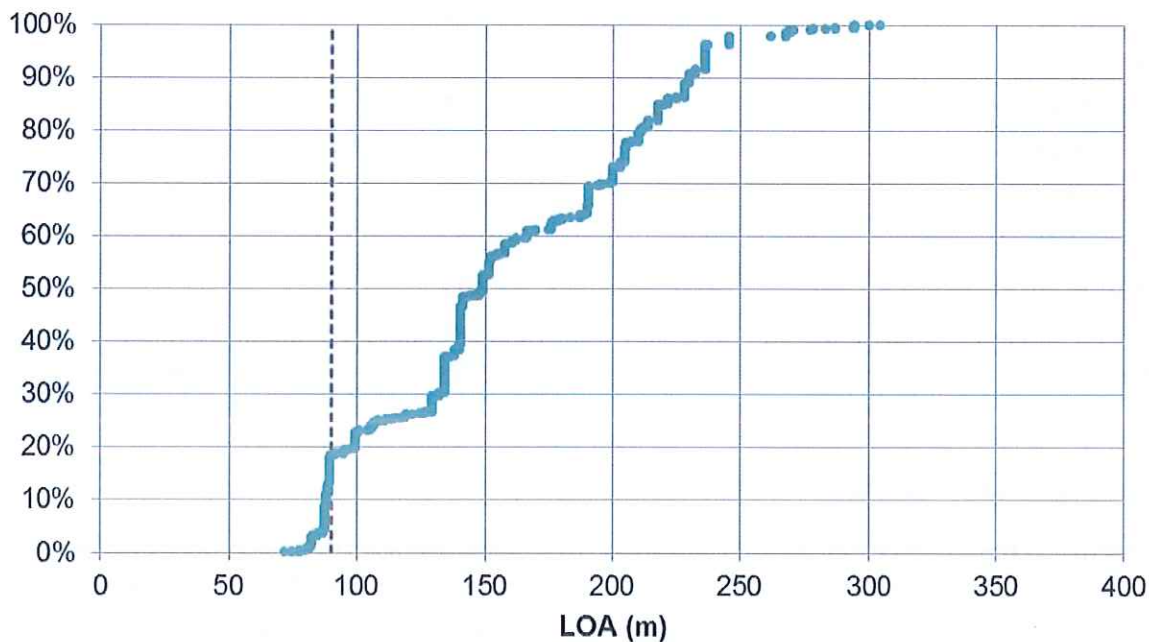


Figure 8.4: Distribution of ship size for all transits by length

Source: PLA POLARIS database

## 8.3. Container ship operations

### 8.3.1. London Container Terminal capacity

The London Container Terminal provides short sea and deep sea berths, with the short sea berths being provided within the impounded dock complex, although short sea ships also use the river berths. The terminal is stated as having a capacity of about 1 million TEU per annum.

### 8.3.2. Deep sea container services

Considering the AIS recorded transits by deep sea container ships operating to London Container Terminal through Gate 1, Table 8.2 shows the largest 5 vessels and the 5 vessels of highest inbound transit frequency.

The data as a whole suggests that London Container Terminal alone generated at least 52 deep sea transits inbound through AIS Gate 1 (i.e. to the west of TOWF), providing a total geometric capacity of at least 170,000 TEU. TEU data was assumed from readily available data for the considered ships.

A full table of vessel transits is supplied in Appendix C.



Table 8.2: Selected deep sea container ship transits inbound through AIS Gate 1

Ship	Length (m)	TEU	Number of transits
<b>Largest (by TEU):</b>			
CMA CGM Sambhar	269	4,045	4
CMA CGM America	269	4,043	6
Polar Peru	230	3,884	1
CMA CGM Africa Three	228	3,718	7
CMA CGM Africa Four	227	3,718	3
<b>Most frequent:</b>			
CMA CGM Africa One	228	3,650	7
CMA CGM Africa Three	228	3,718	7
CMA CGM America	269	4,043	6
CMA CGM Africa Two	228	3,718	6
Maersk Neston	210	2,556	4

Source: Port of London Authority Gate 1 AIS records

### 8.3.3. Short sea container services

Considering the AIS recorded transits by short sea container ships operating to London Container Terminal through Gate 1, Table 8.3 shows the largest 5 vessels and the 5 most frequently transiting vessels.

The data as a whole suggests that London Container Terminal alone generated at least 291 short sea transits inbound through Gate 1 (i.e. to the west of TOWF), providing a total geometric capacity of at least 246,000 TEU. TEU data was assumed from readily available data for the considered ships. A full table of vessel transits is supplied in Appendix D.

Table 8.3: Ten largest container ship transits inbound through AIS Gate 1

Ship	Length (m)	TEU	Number of transits
<b>Largest (by TEU):</b>			
Hansa Rendsburg	175	1,718	1
Paul Russ	161	1,338	1
Varamo	167	1,296	2
Sunrise X	130	1,050	3
Bernhard Schepers	151	1,036	3
<b>Most frequent:</b>			
Elan	150	1,008	23
CMA CGM Goya	142	809	23
Elite	150	1,008	22
Ensemble	135	750	22
Enforcer	135	750	21

Source: Port of London Authority Gate 1 AIS records

## 8.4. RoRo ship operations

Table 8.4 summarises AIS transit records for inbound RoRo ship transits through Gate 1. There were 49 inbound RoRo transits through Gate 1. Many of the short sea RoRo ferries do not pick up pilots.

Table 8.4: RoRo ship inbound transits through AIS Gate 1

Ship	Length (m)	Number of transits
CSCC Asia	200	1
CSCC Europe	200	1
Estraden	163	1
Finnsun	218	12
Glovis Solomon	232	1
Glovis Stella	199	1
Glovis Superior	199	3
Grand Aurora	199	1
Grand Dolphin	199	1
Grand Duke	199	1
Grand Uranus	232	2
Grande Abidjan	236	1
Grande Cotonou	236	2
Grande Dakar	236	1
Grande Lagos	236	2
Grande Luanda	236	3
Grande Tema	236	1
Morning Champion	200	1
Morning Compass	200	1
Morning Composer	200	2
Morning Conductor	200	1
Morning Post	200	1
Schelde Highway	100	1
Taipan	199	1
Thruyton	199	1
Tosca	200	1
Tundraland	190	3
Viking Adventure	199	1

Source: Port of London Authority Gate 1 AIS records

## 8.5. General cargo ships

Table 8.5 summarises AIS recorded inbound transits through Gate 1 by general cargo ships by the nine largest vessels. Table 8.6 shows the most frequenting ships for the same route. In total there were 87 recorded inbound transits through Gate 1.

Table 8.5: Nine largest general cargo ship transits through AIS Gate 1

Ship	Length (m)	Destination	Number of transits
Beatrix	157	Tilbury	1
Fraserborg	156	Tilbury	1
Alaskaborg	143	Tilbury	1
Americaborg	142	Tilbury	1
BBC New York	132	Tilbury	1
Arklow Beacon	120	Tilbury	2
Arklow Beach	119	Tilbury	1
Damina	116	Tilbury	1
Johann	115	Tilbury	1

Source: Port of London Authority Gate 1 AIS records

Table 8.6: Nine most frequenting cargo ship transits through AIS Gate 1

Ship	Length (m)	Destination	Number of transits
Pinnau	88	Tilbury	3
Aristote	86	Tilbury	3
Right Step	101	Tilbury	3
Musketier	85	Tilbury	2
Arlau	88	Tilbury	2
Ohlau	88	Tilbury	2
Bekau	88	Tilbury	2
Linnau	88	Tilbury	2
Bockoe	107	Tilbury	2

Source: Port of London Authority Gate 1 AIS records

## 8.6. Bulk carrier operations

Table 8.7 summarises AIS recorded inbound transits by bulk carriers through Gate 1. There were 14 transits through Gate 1.

Table 8.7: Bulk carrier transits through AIS Gate 1

Ship	Length (m)	Destination	Number of transits
An Chang	190	Tilbury	1
Arklow Bay	119	Tilbury	2
Athos	178	Tilbury	1
Atlantic Elm	190	Tilbury	1
Bulk Bahamas	190	Tilbury	1
Cembay	98	Tilbury	2
Hong Jing	221	Tilbury	1
Navin Vulture	112	Tilbury	1
Sea Ruby	78	Tilbury	1
Sfl Dee	176	Tilbury	1
Sikinos	90	Tilbury	1
Suse	190	Tilbury	1

Source: Port of London Authority Gate 1 AIS records

## 8.7. Cruise ship operations

Table 8.8 summarises the AIS recorded inbound cruise ships transits through Gate 1. The table suggests that the terminal accounted for at least 20 transits through Gate 1.

Table 8.8: Cruise ships inbound transits through AIS Gate 1

Ship	Length (m)	Destination	Number of transits
Columbus	245	Tilbury	6
Magellan	221	Tilbury	6
Astoria	160	Tilbury	3
Marco Polo	176	Tilbury	2
Astor	176	Tilbury	1
Aegean Odyssey	140	Tilbury	1
Artania	230	Tilbury	1

## 8.8. Other vessels

“Other” vessels not in the above categories, including tugs and reefers, account for 21 inbound transits through Gate 1. The largest of these are shown in Table 8.9.

Table 8.9: Other vessels inbound transits through AIS Gate 1

Ship	Length (m)	Destination	Number of transits
St Paul	190	Tilbury	1
Pacific Reefer	175	Tilbury	2
Swedish Reefer	159	Tilbury	1
Italia Reefer	159	Tilbury	1
Hellas Reefer	158	Tilbury	1
Schweiz Reefer	158	Tilbury	2
Nederland Reefer	158	Tilbury	1

## 8.9. Pilotage operations

Table 8.10 confirms the importance of the North East Spit pilot boarding area for the Port of Tilbury.

Table 8.10: Port of Tilbury pilotage transfers for inbound vessels

Pilot boarding area	No. of transfers (River Berths)	No. of transfers (Tilbury Dock)	No. of transfers (Total)
North East Spit	604	150	754
Gravesend	7	292	299
Warps	0	254	254
Sunk	130	8	138
Dover	8	0	8
North East Goodwin	1	0	1
Other	3	12	15
<b>Totals</b>	<b>753</b>	<b>716</b>	<b>1,469</b>

Source: PLA POLARIS database and HR Wallingford

## 9. Potential impacts on Port of Tilbury

### 9.1. Operations potentially least likely to be affected

#### 9.1.1. Non piloted short sea dry cargo ships (< 90m)

Dry cargo ships with a length of less than 90m are not required to carry a pilot east of Sea Reach No 1 Buoy and therefore, there is no requirement for a pilot transfer in the vicinity of the TEOWF. Generally, for these ships a pilot is boarded or landed at the Warps pilot station.

Available POLARIS data indicates that there were about 500 movements by ships with a length of less than 90m to and from the Port of Tilbury. This represents a significant percentage, just over 18%, of the Tilbury ship movements recorded in the POLARIS data.

#### 9.1.2. Deeper draught container ships

The maximum advertised draught for the river berths is 12.5m. Subject to prevailing environmental conditions, deeper draught, inbound ships calling at the river container berths, with a draught of up to 12.5m, and that do not board a pilot at the NE Spit or Tongue, are more likely to board a pilot(s) at Dover or NE Goodwin or the Sunk and to use the Black Deep, deep water route, thus passing well clear of the existing TOWF.

This statement recognises that if the Dover or NE Goodwin or the Sunk pilot boarding areas or the Tongue cannot be used because of the prevailing environmental conditions then pilot boarding would need to take place at the NE Spit, assuming that this pilot boarding area is still operational.

It is difficult to identify the threshold at which a ship would use the Black Deep route instead of the Princes Channel with precision, but for the purposes of this report a draught of 11m has been selected. A tidal benefit of about 4.6m would be required to transit the Princes Channel with a static draught of 11m and an under keel clearance of 15% of the ship's static draught. This tidal benefit may be put in context by noting that mean high water neaps (MHWN) for Shivering Sands is 4.4m above Chart Datum.

It is recognised that a draught of 11.5m was mentioned as being the maximum for the inshore route at the first technical workshop on 27<sup>th</sup> February 2019, but such a draught would require a minimum depth of 13.2m below Chart Datum for an under keel clearance of 15% of the ship's static draught and therefore, a tidal benefit of about 5.2m. As mean high water springs (MHWS) for Shivering Sands is 5.4m above Chart Datum, it is considered that a ship's accessibility with an 11.5m static draught would be unreasonably restricted and that 11m is a reasonable maximum draught for the Princes Channel.

#### 9.1.3. Deeper draught bulk carriers

Available POLARIS data indicates that inbound bulk carriers with draughts of between 10.6m and 11.4m have boarded a pilot at the Sunk and have therefore also passed well clear of the existing wind farm.

Again, this suggests that a static draught of about 11m represents the threshold at which Black Deep, deep water route may be used in preference to the Princes Channel.

#### 9.1.4. Self-discharging bulk carriers

Self-discharging bulk carriers operating to and from Norway are assumed to generally use the Sunk deep water route and would therefore operate well clear of the TOWF.

#### 9.1.5. Scrap export bulk carriers

Scrap export bulk carriers, sailing at a static draught of about 10.5m, use the Sunk route and again operate well clear of the TOWF.

#### 9.1.6. Cruises to Norwegian fjords and other northern destinations

Subject to the comments previously made regarding the availability of pilot boarding and landing areas, cruise ships operating to the Norwegian fjords and other northern destinations will generally use the Sunk pilot station and will therefore not usually be affected by the TOWF.

### 9.2. Operations that may potentially be affected

As may be expected, larger ships operating on routes passing to the north and west of the TOWF are most likely to be affected by the wind farm extension. This is not because there will be insufficient space for the ships to make a safe passage through the area, but because encounters between ships on passage and ships engaging in pilotage transfer operations may take place within a more confined area.

Typically, the ships that may be affected can be summarised as:

- Deep sea combination RoRo container ships;
- Feeder and intra-European container ships;
- Larger, multipurpose dry cargo ships;
- Bulk carriers able to use the inshore route;
- Deep sea car carriers;
- Southbound cruise ships.

## 10. Potential impacts on London Gateway

The preceding sections have clearly demonstrated that the Sunk pilot station is of key importance for London Gateway marine operations, with larger ships using the NE Goodwin and Dover pilot stations if the Sunk Pilot station is not available for any reason.

For the balance of ships that do not use the Sunk, Dover or NE Goodwin pilot stations, then the impacts on ships using the NE Spit pilot boarding areas must be considered. Typically the following issues require consideration:

- The continued ability of container ships, particularly larger container ships to transit west of the TEOWF;
- Any disruption to feeder and/or intra-European ships that deters masters from passing to the west of the TEOWF and results in the ships deviating to pass to the east of the TEOWF;
- Any disruption to feeder and/or intra-European ships passing either to north or west of the TEOWF that may deter masters from using these routes at all.

## 11. Vessel deviation considerations

### 11.1. Overview

The primary focus of this section is a consideration of the implications of ships deviating from the west side of the TOWF to the east side of the TOWF.

If a vessel would normally use the inshore route to pick up a pilot at the NE Spit and then continue on to the Port of Tilbury or London Gateway, that vessel will need to deviate around the extended windfarm and pick up a pilot at either the NE Spit or the Tongue. The deviation to pick up a pilot at the NE Spit would be about 14 nautical miles and the deviation to pick up a pilot at the Tongue would be about 11 nautical miles.

There are presently only a few pilot transfers at the Tongue, reflecting the fact that the Tongue is significantly further out to sea than the NE Spit, requiring longer pilot boat transfers. The Tongue pilot station is also more exposed to sea conditions than the NE Spit. These factors combined make the NE Spit the preferred pilot station for many of the vessels entering the Thames Estuary from the south and east.

### 11.2. Port of Tilbury

#### 11.2.1. Passage planning options for impounded dock berths

Table 11.1 summarises the passage planning options available for inbound and outbound ships for south and south east origins and destinations, based on the assumption that the maximum static draught for ships calling at berths within the impounded dock currently is typically about 10.5m. Such ships are assumed to be able to use the Princes Channel, with tidal benefit as required, and will be able to use the Princes Channel for the foreseeable future. This is considered a reasonable assumption given the constraints imposed by the existing lock dimensions.

Other routes such as the Fisherman's Ghat could be used but the Prince's Channel usually provides the shortest route.



Table 11.1: Route options for Tilbury dock berths for south and south east origins and destinations

Option	Description	West or east of wind farm	Pilot boarding area	Pilot landing area	West or east of NES cardinal
A1	Inbound to Princes Channel	East	Tongue	Not applicable	Not applicable
A2	Inbound to Princes Channel	East	NE Spit	Not applicable	East
A3	Inbound to Princes Channel	East	NE Spit	Not applicable	West (subject to draught)
A4	Inbound to Princes Channel	West	Tongue	Not applicable	Not applicable
A5	Inbound to Princes Channel	West	NE Spit	Not applicable	East
A6	Inbound to Princes Channel	West	NE Spit	Not applicable	West (subject to draught)
A7	Inbound to Princes Channel	East	NE Goodwin/Dover	Not applicable	Not applicable
A8	Inbound to Princes Channel	West	NE Goodwin/Dover	Not applicable	East
A9	Inbound to Princes Channel	West	NE Goodwin/Dover	Not applicable	West (subject to draught)
D1	Outbound from Princes Channel	East	Not applicable	Tongue	Not applicable
D2	Outbound from Princes Channel	East	Not applicable	NE Spit	East
D3	Outbound from Princes Channel	East	Not applicable	NE Spit	West (subject to draught)
D4	Outbound from Princes Channel	West	Not applicable	Tongue	Not applicable
D5	Outbound from Princes Channel	West	Not applicable	NE Spit	East
D6	Outbound from Princes Channel	West	Not applicable	NE Spit	West (subject to draught)
D7	Outbound from Princes Channel	East	Not applicable	NE Goodwin/Dover	Not applicable
D8	Outbound from Princes Channel	West	Not applicable	NE Goodwin/Dover	East
D9	Outbound from Princes Channel	West	Not applicable	NE Goodwin/Dover	West (subject to draught)

Table 11.2: Principal implications of route selection decisions

Option	Time saving benefit	Pilot time on board ship
A1	Discounted	Largely minimised
A2	Discounted	Largely minimised
A3	Discounted	Largely minimised
A4	Partially discounted	Largely minimised
A5	Largely utilised	Largely minimised
A6	<b>Maximised</b>	<b>Minimised</b>
A7	Discounted	Largely maximised or maximised (Dover)
A8	Largely utilised	Largely maximised or maximised (Dover)
A9	<b>Maximised</b>	Largely maximised or maximised (Dover)
D1	Discounted	Largely minimised
D2	Discounted	Largely minimised
D3	Discounted	Largely minimised
D4	Partially discounted	Largely minimised
D5	Largely utilised	Largely minimised
D6	<b>Maximised</b>	<b>Minimised</b>
D7	Discounted	Largely maximised or maximised (Dover)
D8	Largely utilised	Largely maximised or maximised (Dover)
D9	<b>Maximised</b>	Largely maximised or maximised (Dover)

### 11.2.2. Ship speeds

Table 11.3 identifies the wide range of speeds for ships operating to and from the Port of Tilbury. Because of the complex vessel traffic patterns in the area, the ships may not be operating at their service speeds, but nonetheless, the table gives an indication of the value of time that is implicit in the design of a particular ship.

Table 11.3: Selected ship speeds for Port of Tilbury

Reference ship	Type	Service/typical speed (knots)
<b>Usually, more time sensitive ships operating to published schedules:</b>		
CMA CGM Sambhar	4,045 TEU container ship	24
CMA CGM Africa One	3,650 TEU container ship	22
Astor	176m long cruise ship	21
Finnsun	218m long RoRo ship	21
Glovis Solomon	232m long car carrier	20
CMA CGM Goya	809 TEU container ship	19
Grande Lagos	236m long RoRo container ship	19
Columbus	245m long cruise ship	19
Elan	1,008 TEU container ship	18
<b>Slower ships that may have schedule constraints for certain trades:</b>		
Alaskaborg	143m long general cargo ship	15
Schelde Highway	100m long car carrier	14
<b>Typically, less time sensitive ships:</b>		
Hong Jing	221m long Panamax bulk carrier	14
Cembay	98m long cement carrier	13
Arklow Beach	119m long general cargo ship	13

Source: Ship data

With the exception of the 100m long car carrier, the table confirms that most ships operating to a sailing schedule have relatively high speeds and, subject to safe navigation, a route that saves time may be important for such ships, particularly if they are attempting to recover delays.

Conversely, bulk carrier operations are not usually time sensitive and therefore the importance of a time saving route may be reduced.

### 11.2.3. Ship costs

Table 11.4 summarises recent charter rates for the range of container ships that currently call at Tilbury.

Table 11.4: Selected container ship charter rates for Port of Tilbury

Ship size	Charter rate (US Dollars)
9,000 to 11,000 TEU container ships	30,000 per day
5,300 to 7,500 TEU container ships	20,000 per day
5,600 TEU container ships	15,000 per day
4,000 TEU container ships	10,000 per day
2,500 TEU container ships	8,000 per day
1,700 TEU container ships	8,000 per day
1,000 TEU container ships	7,000 per day

## 11.3. London Gateway

Because of the importance of the Sunk deep water route for London Gateway operations, the decision to pass to the west or east of the TOWF is of less importance. Notwithstanding this, Table 7.3 demonstrates that time saving benefits were important for several ships.

## 11.4. Assessment

The decision as to whether to pass to the west or east of the wind farm may depend on several factors on a particular day and more detailed real time navigation simulation studies are required to be completed to enable the threshold for a particular operation to be identified.

# 12. Review of key Applicant submissions

## 12.1. Navigation risk assessment

### 12.1.1. General comments

Marico Marine, on behalf of Vattenfall, have undertaken a Navigation Risk Assessment (NRA) for the application for development consent for the proposed expansion of TOWF. In this section, a commentary on key elements of the NRA is provided. All references to section numbers and figures relate to the NRA.

The NRA is a comprehensive document, however, it has a number of shortcomings and the reader is led astray regarding the impacts of the TEOWF on the ports located in the Thames Estuary in the assessment. The NRA does not mention or assess the potential impacts of the TEOWF on London Gateway Port or the Port of Tilbury, but it does mention the Port of Ramsgate.

Generally, the NRA does not appreciate the strategic importance of London Gateway Port and the Port of Tilbury, with significant additional committed growth and it completely fails to consider the potential economic impacts of the TEOWF on the Thames Estuary. No consideration was given to the likelihood of ships of over 11,000 TEU geometric capacity using the inshore route, and this was a shortcoming of the Pilot Transfer Bridge Simulation that has been used to inform the NRA.

### 12.1.2. Policy

The Port of Tilbury and London Gateway Port have provided a Policy Position Paper as part of Deadline 3 submissions to the DCO (Reference 4) and policy is not addressed further in this report.

### 12.1.3. Surveys and AIS analysis to inform the NRA

#### Overview

Section 5.5 of the NRA presents an analysis of the vessels passing through selected sampling sections or "gates." The principal gates of interest are Gates A and E, as these are located on the western and north western sides of the existing wind farm.

Both gates would be expected to capture vessels in transit along the inshore route, while Gate E would also be expected to capture vessels "dipping down" to the North East Spit pilot boarding/landing area.

### Gate A

The lateral distribution of vessel movements along the Gate A baseline is considered to reflect the proximity of the wind farm to the east, the North Foreland promontory and its associated shallow bathymetry to the west, along with several charted hazards. In more detail, Figure 33 of the NRA shows that most vessel movements were confined to a baseline track of about 3,800m, reflecting, most clearly, the presence of the "Elbow" cardinal mark to the west and, less clearly, charted hazards to the east and the wind farm boundary. The most frequent movements were confined to a significantly narrower corridor with a width of about 2,700m.

### Gate E

Figure 33 of the NRA shows that, compared with Gate A, there are significantly more vessel movements through Gate E and a greater lateral distribution of these movements along the baseline.

The lateral distribution of vessel movements along the Gate E baseline reflects the proximity of the wind farm to the east and the shallow bathymetry to the west, as marked by the Margate East port lateral mark. In contrast to Gate A, vessels pass close to the wind farm boundary, although most movements take place at least 1,400m from the red line boundary.

## 12.1.4. Future marine traffic growth

Future marine traffic growth is dealt with only briefly in Section 6 of the NRA. Section 6 comprises 3 pages with the first page, primarily Section 6.1, providing statistics for United Kingdom major ports between 2000 and 2016. This was used to suggest a continuing trend of declining volumes, expressed as tonnages, without providing any information on unitised cargo, containers and RoRo cargoes, or the several major container terminals in the south-east of the United Kingdom. No mention is made of the Tilbury2 development and there is no mention at all of the Port of Tilbury. In this respect, Tilbury's London Container Terminal is one of the largest reefer container facilities in Europe. The importance of unimpeded maritime access to and from this terminal for high value cargoes may be recognised by noting that Tilbury's London Container Terminal alone generated over 343 short sea and deep sea transits through the inshore route, providing a total geometric capacity of almost 0.5 million TEU through the PLA's AIS Gate 1.

Section 6.1 makes the valid point that, as ship size increases, there will be fewer port calls, but does not recognise that the London Gateway Port has only been in operation since 2013 and is still in the growth phase, with Terminals 4, 5 and 6 still to be developed, and that Tilbury2 is consented and now in the very early stages of construction. The Port of Tilbury and London Gateway had a combined growth of 22.5% between 2016 (the end of the study period, which informed the growth assumptions in the NRA) and 2018, with further growth to be expected. This is greater than the overall 10% growth factor allowed for in the NRA and a continuing trend of growth above that predicted in the NRA is anticipated for the reasons set out above.

Section 6.2 mentions the Port of Ramsgate before the Medway Ports and, in particular, does not mention that there is an LNG import terminal on the Isle of Grain handling the largest LNG carriers currently in operation, some of which use the inshore route. In providing context to the complex vessel traffic patterns in and around the Thames Estuary, no mention is made of the ports within the navigation authority of the Harwich Haven Authority, including Felixstowe, Harwich and Ipswich in Section 6.

Section 6.3 of the NRA concedes that, despite a predicted national decline in maritime trade, an increase in maritime traffic may be expected at the Port of London.

### 12.1.5. Risk assessment

The methodological basis for findings that marine risks have been reduced to as low as reasonably practical (ALARP) levels is well established and understood. However, since future demand is considered at a relatively high level only in Section 6 of the NRA, it is not clear that the collision modelling reported to have been carried out takes sufficient account of the space required for operations with significantly larger ships or greater numbers of ships.

### 12.1.6. Summary

The NRA does not appear to recognise the complexity of navigation associated with the routes leading around the existing windfarm, the likely growth in shipping using these routes and the prospect that larger ships are likely to use the inshore route in the future.

It is considered that the NRA needs to be repeated, taking into account larger vessels and increased traffic volumes. Parameters for the required sea room should consider the largest vessels (of 400, 366, 333 and 299m in length), vessel handling characteristics, and a worse case beam of 60m and draught of 11.5m. Appropriate consultation should be carried out on the NRA and engagement with key shipping interested parties will be required.

Points of reference for considering sea room distances are Elbow Buoy, North East Spit Pilot Diamond, North East Spit Buoy and Tongue Deep Water Diamond. MGN543, as referred to in the NRA, is considered to be a starting point for considering sea room. The World Ocean Council, Nautical Institute and IALA special paper titled "The Shipping Industry and Marine Spatial Planning – A Professional Approach – November 2013" is also relevant when considering the tolerability of risks.

## 12.2. NE Spit Pilot Transfer Simulation Study

In respect of the Pilot Transfer Bridge Simulation report, the key point which this study was required to consider was whether or not there will be sufficient space for a ship to manoeuvre safely to transfer a pilot(s). As a starting point, the study only considered ships of up to 240m in length, which is not long enough, given that ships of over 330m transit through the inshore route and it is clear that such larger ships will require more space to accommodate their greater swept paths. Accordingly, the study cannot be relied upon and a larger range of ships is required to be examined.

The largest vessel reported to use the NE Spit Pilot Station is the "Valparaiso Express" (Table 7.6), at 333m in length and 11.3m draught. This is 93m, or almost 40%, longer than the longest ship simulated in the Pilot Transfer Simulation Study. It is likely that significantly larger ships would be able to use the inshore route at an appropriate draught in the future.

There are also presentational issues associated with the study's use of a tug, instead of a pilot boat, in the simulation runs.

It is considered that the Pilot Transfer Simulation Study should be repeated using mutually agreed ships.

The objectives of the repeat study should be to:

- Demonstrate likely transit tracks through the inshore route and around the NE Spit cardinal mark for a range of agreed ships and agreed environmental conditions, with and without the wind farm extension in place;

- Undertake a pilot transfer study using agreed ships with and without the windfarm extension in place, in agreed environmental conditions. At least 2 pilot transfers should be carried out simultaneously.

## 13. Summary and principal conclusions

### 13.1. Summary

This study has summarised the present levels of traffic to London Gateway and the Port of Tilbury. It demonstrates the importance of these ports within the Port of London, and has quantified the vessel traffic that utilises the inshore route to the west of TOWF that may be impacted by TEOWF.

The study has also quantified the use of the NE Spit Pilot Station by ships calling at London Gateway and the Port of Tilbury.

### 13.2. Conclusions

#### 13.2.1. Navigation risk assessment

This study concludes that the Navigation Risk Assessment undertaken to support the application for the TEOWF should be repeated taking into account larger vessels and increased traffic volumes.

#### 13.2.2. Structure exclusion zone

Following receipt of comments from several interested parties, the Applicant has sought to reduce the potential impact on the two ports' marine operations by introducing a structures exclusion zone (SEZ), principally at the north west corner of the expanded wind farm. This SEZ was submitted to the examination at Deadline 4 under reference REP4-018.

The shape and extent of the SEZ requires justification, preferably by carrying out additional real time navigation simulation studies. As mentioned previously, as the Deadline 4 submission of the SEZ was not accompanied by the NRA Addendum, this report has not considered whether or not the additional space provided addresses the primary concerns of the two ports, from a navigation standpoint. Such analysis of the NRA Addendum will be carried out by the two ports as soon as possible.

Nevertheless, it is understood that the NRA Addendum is not based upon real time navigation simulation studies and it is considered that without such studies it will be incomplete.

## 14. Recommendations

### 14.1.1. Navigation risk assessment

The Navigation Risk Assessment should be repeated and as part of that assessment, the Pilot Transfer Simulation Study should be repeated using mutually agreed ships. The NRA should identify factors that will be affected by the TEOWF and focus on these. London Gateway Port and the Port of Tilbury will need to be involved so that matters that are of importance to them are satisfactorily addressed during this reassessment.

### 14.1.2. Structures exclusion zone

Additional real time navigation simulation studies should be carried out to demonstrate that the proposed SEZ provides sufficient space for continued safe navigation within the NRA study area.

## 15. References

1. Port of London Authority, "River Thames Critical Depths List," 25<sup>th</sup> March 2019, 10:36am.
2. <https://ihsmarkit.com/research-analysis/2017-review-port-call-sizes-continue-to-rise.html>
3. <https://server1.pla.co.uk/Sovereign-Maersk-breaks-Port-of-London-Record>
4. <https://www.forthports.co.uk/wp-content/uploads/2018/03/3965.pdf>
5. <https://www.gov.uk/government/statistics/port-freight-statistics-2017-final-figures>
6. Vattenfall Wind Power Ltd, Thanet Extension Offshore Wind Farm, Appendix 1 to Deadline 4B Submission: Addendum to Navigation Risk Assessment, April 2019 Revision A.



## Appendices

### A. London Gateway deep sea Gate 1 transits

Table A.1: London Gateway deep sea Gate 1 transits

Name	Length (m)	TEU	Transits
Al Bahia	306	4,898	1
Bomar Resilient	210	2,602	1
Cap San Raphael	333	9,814	1
CCNI Andes	300	9,000	1
CMA CGM Brazil	189	2,339	3
CMA CGM Cayenne	190	2,140	2
CMA CGM Marseille	190	2,140	5
CMA CGM St. Laurent	190	2,140	7
Evridiki G	210	2,530	1
Marfret Guyane	170	1,713	8
Marfret Marajo	170	1,691	6
Moen Island	222	2,824	2
MSC Carmen	275	4,860	1
MSC Chloe	300	9,400	1
MSC Iris	203	1,254	1
MSC Regina	259	4,056	1
Rio Thelon	210	2,556	1
Rotterdam Express	294	4,890	1
Santa Bettina	222	2,030	1
Seatrade Orange	185	1,580	1
Seatrade White	185	1,580	1
St Louis Express	243	3,237	3
Winchester Strait	175	1,740	1

Source: Port of London Authority Gate 1 AIS records Pilotage operations

## B. London Gateway short sea Gate 1 transits

Table B.1: London Gateway short sea Gate 1 transits

Name	Length	TEU	Transits
DS Blue Ocean	129	698	6
Helena Schepers	152	1,036	10
Ice Crystal	129	700	5
Wes Carina	153	1,036	7

Source: Port of London Authority Gate 1 AIS records Pilotage operations

## C. Tilbury deep sea container ship Gate 1 transits

Table C.1: Tilbury deep sea container ship Gate 1 transits

Name	Length (m)	TEU	Transits
AS Fabiana	166	1,296	1
AS Floretta	165	1,269	2
BSL Cape Town	210	2,556	1
CMA CGM Africa Four	227	3,718	3
CMA CGM Africa One	228	3,650	7
CMA CGM Africa Three	228	3,718	7
CMA CGM Africa Two	228	3,718	6
CMA CGM America	269	4,043	6
CMA CGM Sambhar	269	4,045	4
Georgia Trader	204	2,122	3
HSL Porto	208	2,478	1
HSL Sheffield	209	2,556	1
Maersk Nairobi	210	2,556	1
Maersk Neston	210	2,556	4
Maersk Newcastle	210	2,556	2
Nordisabella	195	2,500	2
Polar Peru	230	3,884	1

Source: Port of London Authority Gate 1 AIS records Pilotage operations

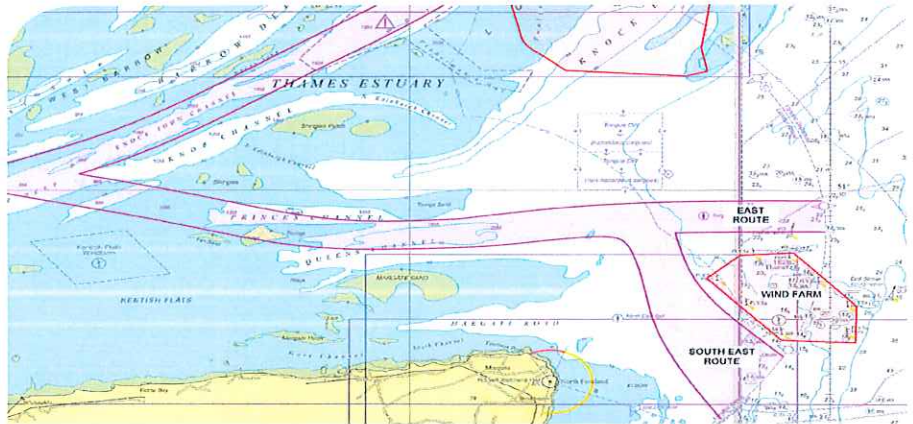
## D. Tilbury short sea container ship Gate 1 transits

Table D.1: Tilbury short sea container ship Gate 1 transits

Name	Length (m)	TEU	Transits
Alinda	129	690	6
AS Laguna	139	916	2
Aurora	134	868	1
BBC Georgia	138	685	1
Bernhard Schepers	151	1,036	3
CMA CGM Goya	142	809	23
Comoros Stream	155	492	1
Conmar Avenue	151	1,036	2
Conmar Elbe	133	707	5
Corina	122	676	1
Dance	125	801	1
Dina Trader	134	868	1
Elan	150	1,008	23
Elite	150	1,008	22
Encounter	136	750	11
Enforcer	135	750	21
Ensemble	135	750	22
Expansa	141	877	7
Externo	141	877	9
Grete Sibum	151	1,036	3
Hansa Rendsburg	175	1,718	1
Heinrich Schepers	150	1,036	2
Henneke Rambow	135	868	13
Iduna	125	801	1
India	136	864	1
JRS Capella	130	698	9
JSP Mistral	140	900	9
JSP Slidur	134	868	2
Kristin Schepers	141	803	13
Luca	101	509	1
Maris	101	509	1
Marja	100	509	1
Max Mars	133	704	2

Name	Length (m)	TEU	Transits
Meandi	141	803	13
Moveon	134	868	1
Neuburg	142	812	18
Nordic Luebeck	152	1,036	4
Paul Russ	161	1,338	1
Paula Anna	107	389	2
Philemon	158	880	5
Ranger	141	803	12
Reestborg	170	558	1
Stefan Sibum	152	1,036	5
Sunrise X	130	1,050	3
Varamo	167	1,296	2
Vega Philipp	155	917	1
Wilhelm	135	868	1
Wilson Garston	82	137	1

Source: Port of London Authority Gate 1 AIS records Pilotage operations



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**APPENDIX C**

**POTLL - COPY OF PRESENTATION GIVEN AT ASI2 ON 15 APRIL 2019**



PORT OF  
**TILBURY**  
LONDON

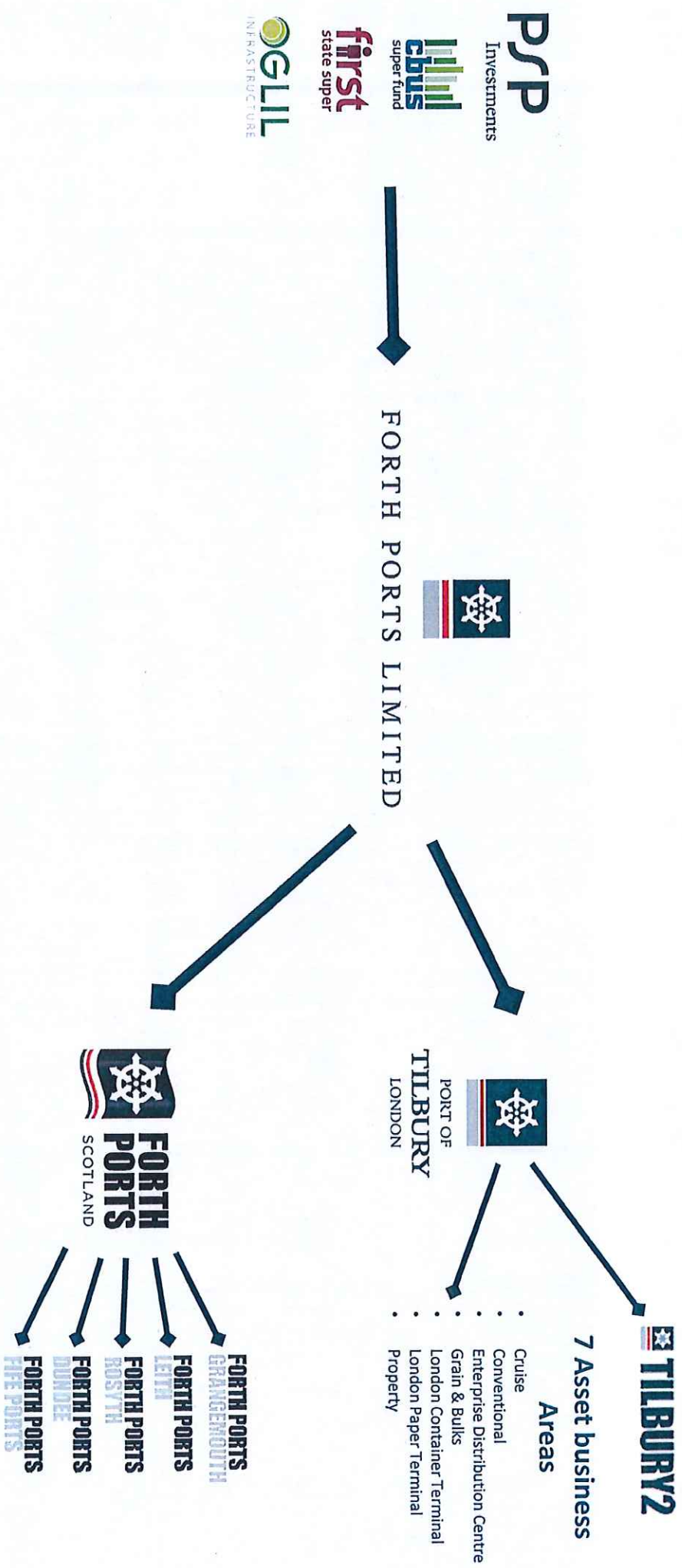
# Overview of Port of Tilbury Planning Inspectorate 15th April 2019

**Stuart Wallace**  
Chief Operating Officer Forth Ports Limited





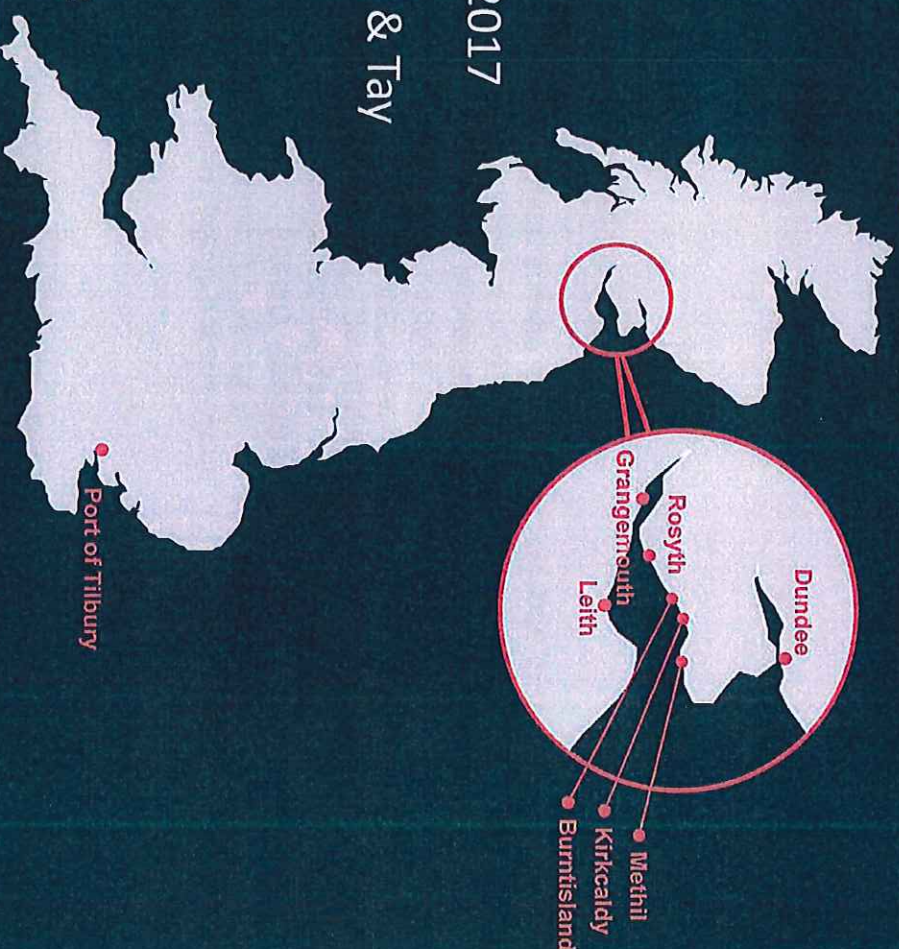
# FORTH PORTS OWNERSHIP STRUCTURE



# WHO WE ARE

## Forth Ports is the 3<sup>rd</sup> largest Port Group in the UK

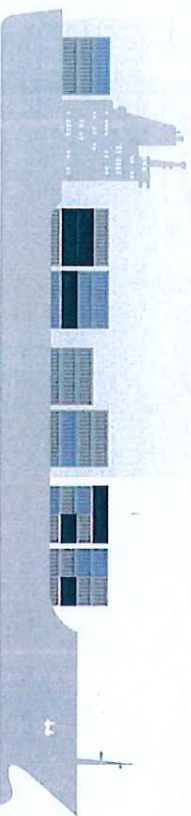
- 8 ports across Scotland & England
- Over 1,100 employees
- £214.8m turnover in 2017
- 41m tonnes handled across the group in 2017
- Statutory Harbour Authority for the Forth & Tay
- Diverse range of services provided
- Freehold land owner
- Contribution £950 million economic value



Port of Tilbury London Limited

# Port of Tilbury London Limited Current Position

**16 million tonnes**  
CARGO PROCESSED EACH YEAR



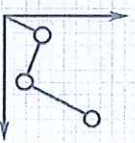
- UK's 3rd largest port in volume terms
- Largest port on the Thames (36% market share)
- #1 UK port – forestry products, construction materials, paper, grain, recyclables, warehousing space
- Britain's greenest port – generating 50% of renewable energy
- Crown Police Force & AEO (Authorised Economic Operator) status
  - 27 million people live within a 3 hour radius by road
  - 70% of the UK population within 120 miles
- £1bn investment programme, 2012-20
  - Provide multimodal onward distribution solutions (3 railheads, barging on the Thames)
    - 5 miles from the M25

## Supporting growth of the UK & South East

**3,500**  
EMPLOYEES AT  
PORT

**8,300**  
LOCAL JOBS  
SUPPORTED  
BY PORT OF  
TILBURY

GROSS VALUE ADDED



**GVA:**  
**£394 million**



**UK population**  
70% within a 120 mile radius



Port of Tilbury London Limited

Part of the Forth Ports Group

# WHAT WE DO & WHAT WE HANDLE

## Port of Tilbury Sector Specialisms



Forest Products



Automotive



Grain



Dry Bulks



RoRo



Containers



Project Cargo



Perishable Food & Drink



Infrastructure & Construction



Waste/Recyclables



Cruise



Rail



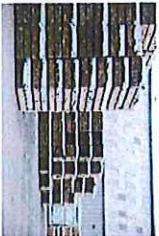
Port of Tilbury London Limited

Part of the Forth Ports Group

# FACTS ABOUT TILBURY

One of the largest  
multipurpose ports in the  
UK

- 34 operational berths
- Over 7.5 km quay
- Land Area: 919 acre site
- Warehouse Space: over 5m sqft of warehousing
- Further land under option for development
- Rail Terminals: 3 terminals onsite
- 120+ companies operate within the port
- Directly employ 600 with up to 3,000 onsite daily
- Britain's Greenest Port/ prime geographical location/position
- 8,000 vehicle movements per day



## Ro-Ro, Cars & General Cargo Handling

- 3 x ferry services running into European ports with supporting facilities
- 2 x deep sea ro-ro services handling general cargo
- 55 acres of dedicated car handling facilities offering pre delivery inspection services
- Container devanning operations to support customer business
- Stevedoring, heavy lift and support port services
- Shunting operations

## Property & Specialised Operations

- 2 onsite Flour Mills
- A number of dedicated recycling & biomass commodity facilities
- Cement manufacturing facility (£36m+ of inward investment)
- Cold and Chill Stores
- Office Facilities and Lorry Parks
- London's deep-water cruise terminal (40+ cruise vessels per year/60+ PAX)

## Grain & Bulk Terminals

- Grain handling market leader in UK
- 6 bulk handling berths
- Fully automated grain facility handling imports and UK exports
- Onsite Silo storage capacity of 120,000 tonnes
- Range of flexible undercover & external storage facilities for bulk commodities
- Bulk commodities handled – Aggregates, Cement, Animal Feed & Waste Materials

## Forest Products

- Largest paper & plywood handling port in the UK (3 million tonnes +)
- 2 dedicated paper handling facilities
- 30 acres of plywood handling facilities for 7 plywood customers
- First fully automated paper handling facility with a port in the UK
- Handling containerised and deep sea shipments



Port of Tilbury London Limited

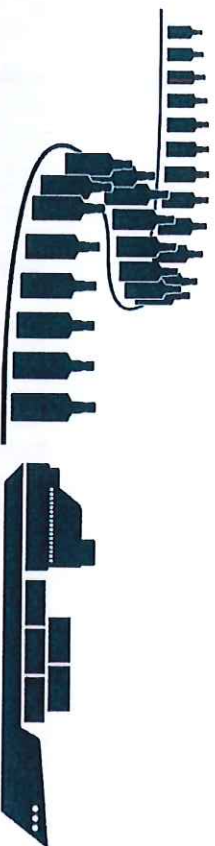
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# BENEFITS OF PORTCENTRIC – time is of the essence

## Consolidation

Why consolidate at a port pre export / post import?

- Simplify customers supply chains
- Reduces truck miles
- Reduces supply chain costs
- Process efficiencies
- Support 24/7 operational solutions
- Offers flexibility
- Provides high level of security
- Bespoke solution tailored to our customers needs
- Provides multimodal onward distribution options (road, rail, sea & barge)
- Value added services
- Access to a large support network



Port of Tilbury London Limited

Consolidation solutions for projects



Examples of permanent consolidation solutions



## 31 Independent working terminals

Part of the Forth Ports Group

# ONWARD DISTRIBUTION



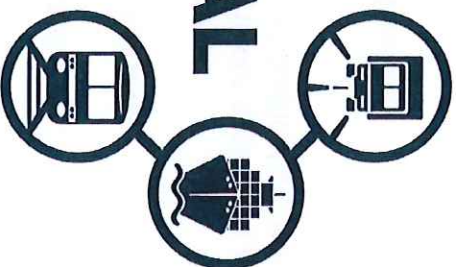
**Road Transport** - 5 miles  
from the M25

## Barging direct to the city

- 22 nautical miles from tower bridge
- Co2 emission reduction
- Reduction in cyclist fatalities
- Reduction in road freight movements
- Logistics efficiencies gained with cost reductions
- Opportunities for Passenger and Freight movements



# TRIMODAL



# 3



## Rail Transport

- Connected to the national rail network
- Routing into London

**Tilbury offers a seamless transition from sea to land through efficient 24/7 operations**



Port of Tilbury London Limited

Part of the Forth Ports Group

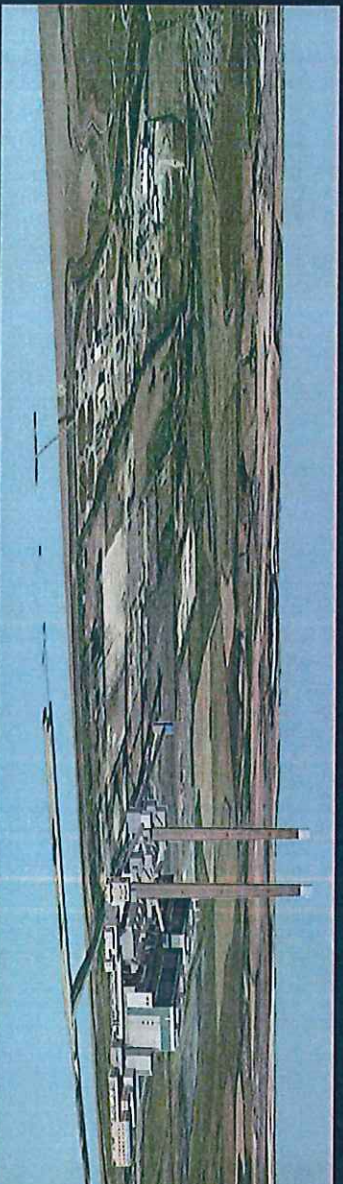
# PORT OF TILBURY MARINE ACCESS

- Impounded dock with lock entrance direct from River Thames
- 'Panamax' lock
  - Length 262.1 m
  - Beam 32.3m
  - Draught 11.4m
- Pilotage required for river access via dock
- Tidal flows dictate access parameters depending on size and capability of vessels
- Riverside berths provide additional capacity and capability





# TILBURY2 : Doubling the throughputs for Port of Tilbury



## Overview

- Extension of the existing port
- 152 acre site
- Ro-Ro & CMAT Terminal
- Deep water jetty
- New infrastructure corridor
- Rail terminal

Throughputs 500,000 ro-ro units

1.6 million tonnes aggregates

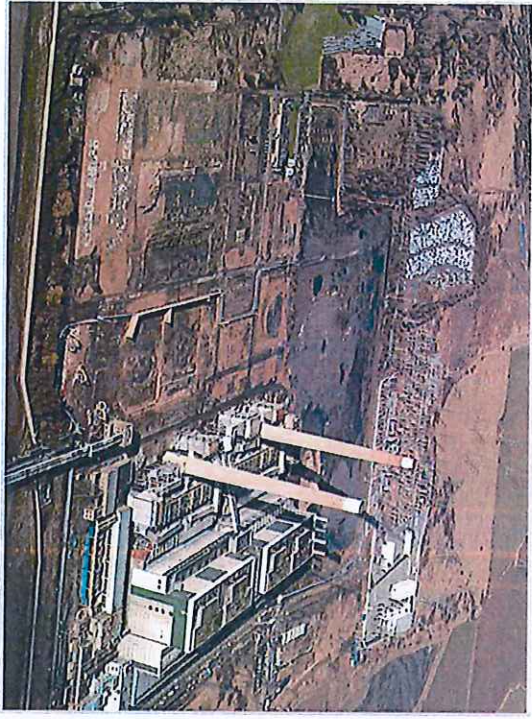
## Timelines

- Development Consent Order submitted to Secretary of State Oct 2017
- Consent provided for the development in February 2019
- Construction commenced in March 2019
- Scheduled in be operational in Q2 2020



Port of Tilbury London Limited

Part of the Forth Ports Group



## Tilbury 2

### Current

### Site

### Development



# Port of Tilbury



Port of Tilbury London Limited

Part of the Forth Ports Group



PORT OF  
**TILBURY**  
LONDON

Part of the Forth Ports Group

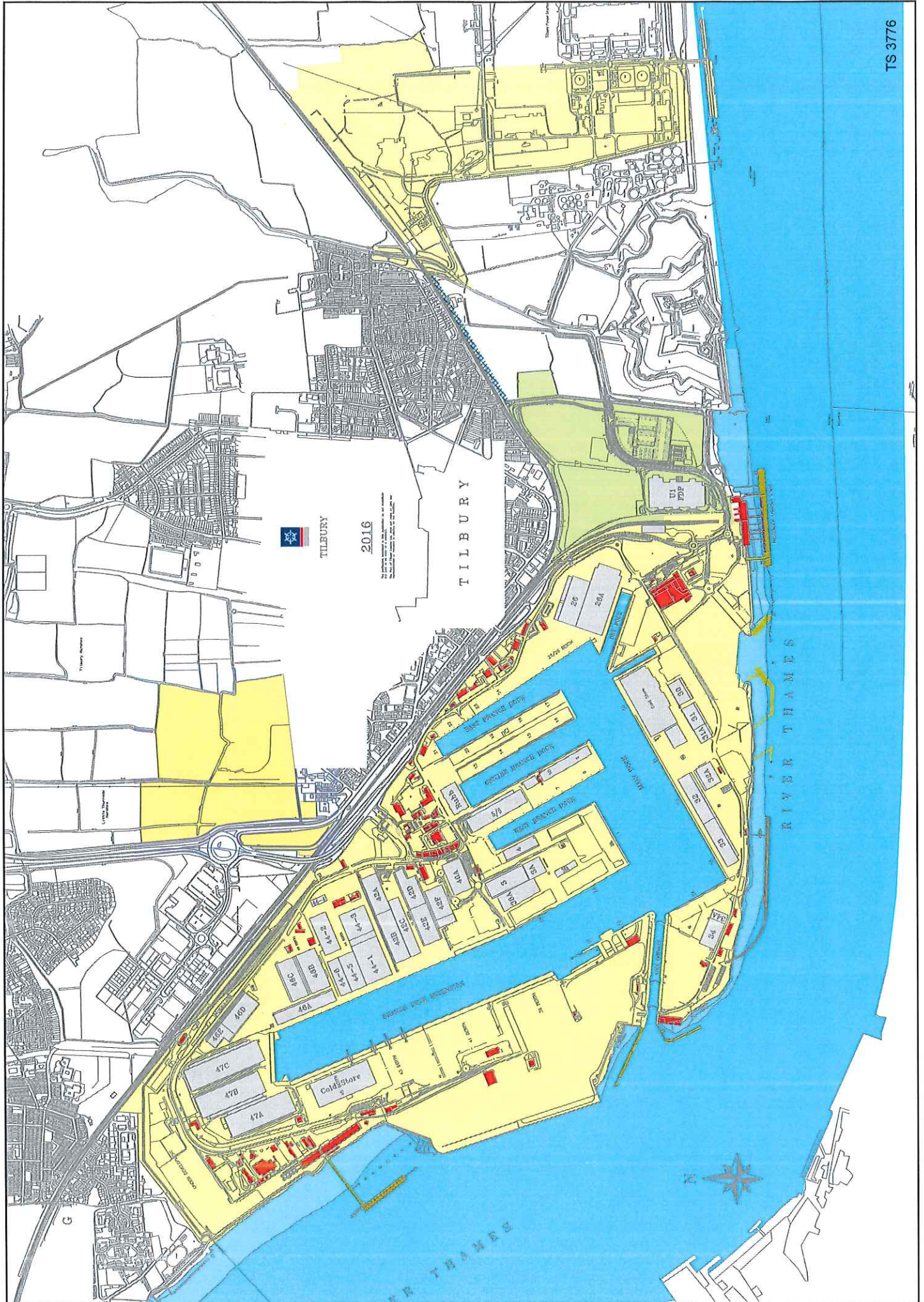
[forthports.co.uk](http://forthports.co.uk)

# Thank you

Any Questions

**APPENDIX D**

**POTLL - MASTERPLAN OF FACILITY**



TILBURY

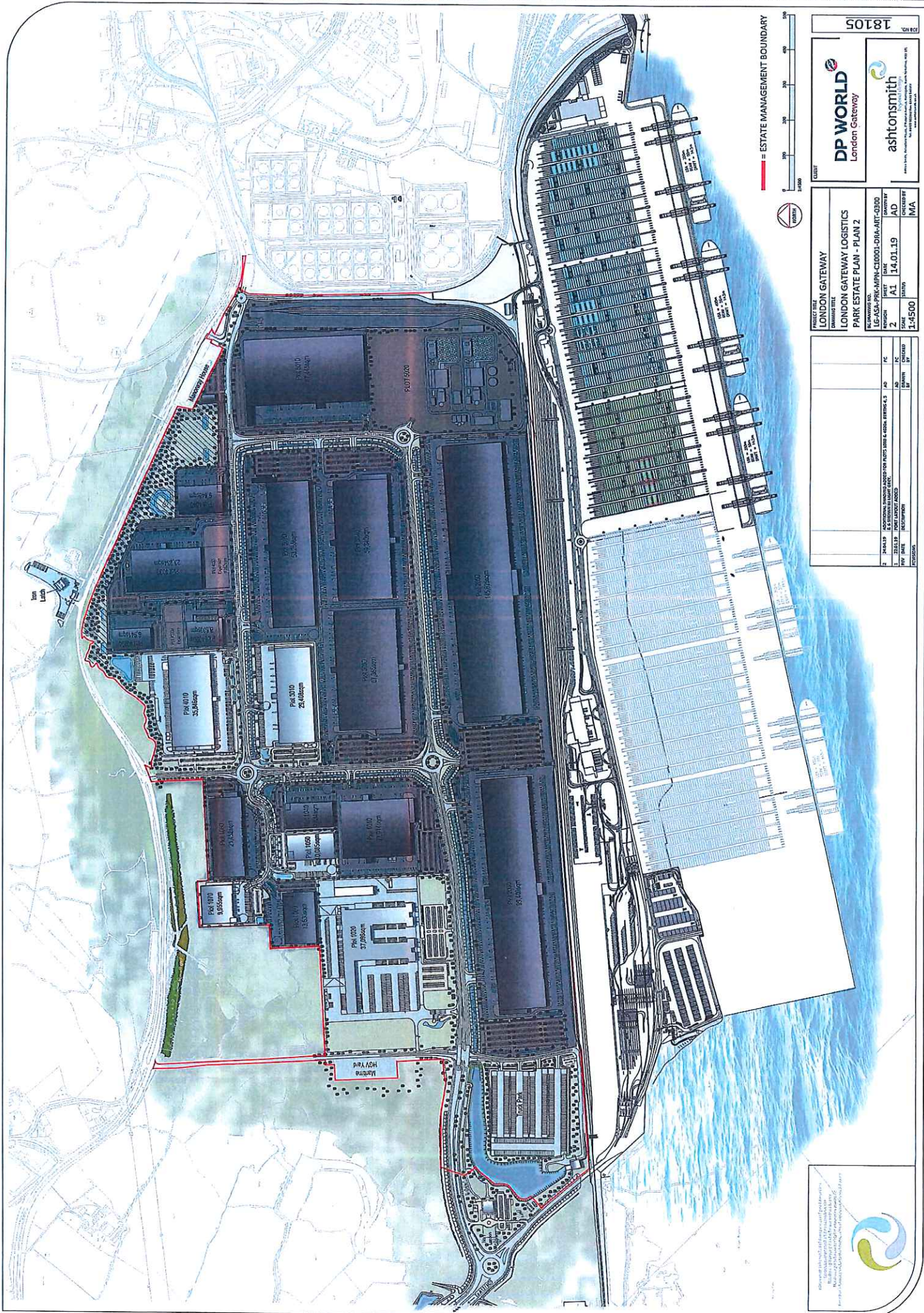
2016

TILBURY

RIVER THAMES



**APPENDIX E**  
**DP WORLD LONDON GATEWAY – MASTERPLAN**



**18105**

**DP WORLD**  
London Gateway

**ashtonsmith**  
Ashtonsmith Limited, The Park, Park Road, London Gateway, South East, Kent, UK  
Tel: 01858 422222

**CLIENT**  
LONDON GATEWAY LOGISTICS  
PARK ESTATE PLAN - PLAN 2

**PROJECT NO.** LG-ASA-PRG-MPN-CH0001-018A-RT-0300  
**REVISION** 2  
**DATE** 14.01.19  
**CHECKED BY** AD  
**DATE** 14.01.19  
**SCALE** 1:4500  
**DRAWN BY** MA

NO.	DESCRIPTION	DATE	BY	CHKD
1	24.04.19 APPROVED FOR CONSTRUCTION	24.04.19	AD	TC
2	23.01.19 MODIFIED LAYOUT	23.01.19	AD	TC

**ASHTONSMITH**  
Ashtonsmith Limited, The Park, Park Road, London Gateway, South East, Kent, UK  
Tel: 01858 422222

**PROJECT TITLE** LONDON GATEWAY  
**DRAWING TITLE** LONDON GATEWAY LOGISTICS  
**PARK ESTATE PLAN - PLAN 2**

**PROJECT NO.** LG-ASA-PRG-MPN-CH0001-018A-RT-0300  
**REVISION** 2  
**DATE** 14.01.19  
**CHECKED BY** AD  
**DATE** 14.01.19  
**SCALE** 1:4500  
**DRAWN BY** MA



**APPENDIX F**

**POTLL/DPWLG EMAIL TO THE APPLICANT DATED 5 APRIL 2019**

**Trevor Hutchinson**

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**From:** Trevor Hutchinson  
**Sent:** Friday, April 05, 2019 9:08 AM  
**To:** [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** RE: Minutes from the Hazard Workshop

Dan

My only comment on the minutes relates to Hazard Note 1. I'm not convinced regarding the scoring re Stakeholders (i.e. consequence for businesses) which is defined in the minutes as "negligible" in the most likely scenario. Being a layman I'm not sure of the procedures followed immediately after a collision but any delay of a cargo ship to port has the potential for significant cost to business (operating costs of ship and potential loss of cargo (particularly if perishable)). It may be that loss of cargo is considered under cargo but I need clarification/reassurance on this point.

It also seems to me that grounding of a cargo ship could have a significant cost to business.

Vince may have additional comments.

Best Wishes

**Trevor Hutchinson**  
Head of Planning

**DP WORLD**   
London Gateway

M: [REDACTED]  
T: +44 (0)1375 648316  
E: [trevor.hutchinson@dpworld.com](mailto:trevor.hutchinson@dpworld.com)

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No.1 London Gateway  
Stanford-le-Hope  
Essex SS17 9DY  
UK

[londongateway.com](http://londongateway.com)

*Safety is sacrosanct; it will not and cannot be compromised:*

**RISK ONCE  
REGRET FOREVER**

**From:** daniel.bates@vattenfall.com [mailto:daniel.bates@vattenfall.com]  
**Sent:** Thursday, April 04, 2019 4:04 PM

[REDACTED]

[REDACTED]  
**Subject:** Minutes from the Hazard Workshop

Dear all,

Attached are some draft minutes from the hazard workshop last Friday. These are fairly light and seek to capture the main points of discussion / agreement during the workshop.

I appreciate that everyone is very busy at the moment but we are intending on appending these to our submission and would I would be very grateful for any comments or agreement that is possible before 5pm tomorrow

Kind regards

Dan

**Daniel Bates**

*Consents Manager – Thanet Extension*

Offshore Wind Consenting

[REDACTED]  
[daniel.bates@vattenfall.com](mailto:daniel.bates@vattenfall.com)

[www.vattenfall.co.uk](http://www.vattenfall.co.uk)

Please consider the environment before printing this e-mail

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We have recently changed the registered offices of a number of our companies. The following are now registered at First Floor, 1 Tudor Street, London, EC4Y 0AH:

Vattenfall Wind Power Ltd, Vattenfall Heat UK Limited, Clashindarroch Wind Farm Limited, Vattenfall UK Sales Limited, Norfolk Boreas Limited, Kentish Flats Limited, Norfolk Vanguard Limited, Ormonde Energy Limited, Ourack Wind Farm One Limited, Ourack Wind Farm Two Limited, Thanet Offshore Wind Limited.