Thames Tideway Tunnel Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Navigational Issues and Preliminary Risk Assessment

Doc Ref: 7.20.04 Kirtling Street - Annexes: Hazard Logs

APFP Regulations 2009: Regulation 5(2)(q)

Hard copy available in

Box **72** Folder **A** January 2013







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Annexes

List of annexes in order

Annex A: Hazard log introduction Annex B: Most likely hazard log - Phase A: Construction of Jetty Annex C: Most likely hazard log - Phase B: Jetty operational Annex D: Most likely hazard log - Phase C: Removal of Jetty Annex E: Worst credible hazard log - Phase A: Construction of Jetty Annex F: Worst credible hazard log - Phase B: Jetty operational Annex G: Worst credible hazard list - Phase C: Removal of jetty

Annex A – Hazard log introduction

Construction Phases A.1

- A.1.1 The assessment has been divided into 4 distinct project phases to allow for assessment of hazards and the proposal of risk reduction measures commensurate with the risk posed by different operations associated with the project. These are:
 - Phase A Construction of jetty
 - Phase B Jetty operational
 - Phase C Removal of jetty.

Risk assessment criteria A.2

A.2.1 Risk Matrix - The following risk matrix has been used to provide a risk score that combines severity of a particular consequence together with the probability of the consequence occurring.

	1 - Rare	1	2	3	4	5
pc	2 - Unlikely	2	4	6	8	10
Likelihood	3 - Possible	3	6	9	12	15
Like	4 - Likely	4	8	12	16	20
	5 - Almost Certain	5	10	15	20	25
	Severity	Level 1	Level 2	Level 3	Level 4	Level 5

A.2.2 Risk Classification - The risk score indicates the magnitude and acceptability of the risk in accordance with the ALARP principle.

Score	Classification	Definition
1 - 2	Slight	No Action is required
3 - 4	Minor	No additional controls are required, monitoring is required to ensure no changes in circumstances
5 - 9	Moderate	Efforts should be made to reduce risk to 'As Low As Reasonably Practicable' (ALARP). Job can be performed under direct supervision of Senior Officer
10 - 14	High	Efforts should be made to reduce risk to 'As Low As Reasonably Practicable' (ALARP). Job can only be performed after authorisation from Harbour Master and after further additional

		controls require
15 - 25	Extreme	Intolerable risk.

- A.2.3
 - Port of London Authority. It identifies four distinct areas of risk with the probable consequences associated with each hazard assessed in terms of harm or loss to:
 - People (life);
 - Environment;
 - Operational Impact, and;
 - Media Attention.

People	Level
First aid case / Medical treatment case	1
Restricted work case	2
Lost Time Injury / Moderate permanent partial disability injury	3
Single Fatality / Severe permanent partial disability	4
Multiple fatalities	5

Environment	Level
Low impact with no lasting effect	1
Temporary effect / Minor effect to small area	2
Short to medium term impact	3
Medium to long term effect / large area affected	4
Long term impact / severe impact on sensitive area	5

ed under the circumstances Job is not authorised

Severity – The criteria used throughout this assessment has been provided by the

Operational Impact	Level
Insignificant or no damage to vessel / equipment	1
Minor or superficial damage to vessel / equipment	2
Moderate damage to vessel / equipment requiring immediate repairs	3
Major damage to vessel / equipment and detention	4
Very serious damage to vessel or equipment possible criminal proceedings	5

Media Attention	Level
No Coverage	1
Local coverage	2
Regional coverage	3
National coverage	4
International coverage	5

Annex B – Most likely hazard log: Phase A - Construction of jetty

B.1 Most likely summary hazard list: Phase A - Construction of jetty

Hazard Id	Hazard Title	Hazard Description	People	Environment	Operational	Media	4A
	Restricted Working -	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the	6	4	6	4	5A
1A	Working jetty in close proximity to authorised channel	authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for					6A
		existing traffic. Due to the reduced channel width a river incident occurs.	9	6	9	6	7A
		Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.	9	0	9	0	
2A	Interaction with Cory Environment al Ltd operations at Cringle Dock	It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability					8A
		to operate this service. Due to the proximity of the proposed jetty					9A
		to Cory operations, a river incident occurs. The proposed jetty is situated directly in	9	6	9	6	
	Interaction	This jetty is used by barges for the delivery of aggregates. The position of	9	0	9	0	10A
3A	with barges using the Cemex jetty	the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty.					11A
		Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.					

4A	Contact - Commercial Freight Operator with Jetty	A Commercial Freight Operator makes contact with the Thames Tunnel Jetty.	6	4	6	4
5A	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	6	4	6	4
6A	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	6	4	6	4
7A	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel jetty.	6	2	6	4
8A	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Thames Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	4	4	4	4
9A	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free temporary/layup moorings.	6	4	6	4
10A	Contact - Thames deconstructi on equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	N/A	N/A	N/A	N//
11A	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	6	4	6	4

12A	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	6	4	6	6
13A	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	6	4	6	6
14A	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	6	2	6	6
15A	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	N/A	N/A	N/A	N/A

16A	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	N/A	N/A	N/A	N/A
17A	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	N/A	N/A	N/A	N/A
18A	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	N/A	N/A	N/A	N/A
19A	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	N/A	N/A	N/A	N/A

Most likely hazard list – Phase A: Construction of jetty **B.2**

1A - LTTKS - Restricted Working - Working Jetty in close proximity to authorised channel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	
1A - LTTKS	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	 Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications VTS Navigational Broadcast Permanent / Temporary Notice to Mariners Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation General Directions Emergency Plans & Procedures COLREGs 	 The deat Kirtle the audition being statements of the second sec

Pre Control - People					
Severity Probability Risk Score Risk Band					
3 4 12 High					

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
2 4 8 Moderate				

Relevant PLA Guidance				

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity Probability Risk Score Risk Band				
3	2	6	Moderate	

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Post Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF
- The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m.

Proposed Additional Mitigation

design and layout of the proposed new jetty rtling Street is greater than 15m away from authorised channel and is there assessed as g sufficiently away from the authorised nnel as to not impact on existing navigational ty.

ce to Mariners to inform river users of tion and extent of works at this site.

ine contractors tasked with constructing to provide method statement and conduct assessment activities for the construction of etty and associated infrastructure

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
2A - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	 Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs

2A - LTTKS - Interaction with Cory Environmental Ltd operations at Cringle Dock

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 4 12 Hi					

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
2	4	8	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Risk Band			
3	3	9	Moderate	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
2	3	6	Moderate	

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
2	3	6	Moderate	

Assessment

- Post Control score takes into consideration relocate
- Consultation with Cory regarding the location and s
- AIS analysis of Cory track movements has been und
- Assessment based on jetty location as per Thames 257110 Rev AF

Proposed Additional Mitigation
 Final location of jetty takes into consideration effect on operations of all stakeholders.
 Notice to Mariners to inform river users of duration and extent of works at this site.
 Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

t Notes
ed jetty position.
size of the jetty has been conducted.
dertaken.
Tideway Tunnel drawing 100-DH-CNS-PWH11-

3A - LTTKS - Interaction with barges using the Cemex jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
3A - LTTKS	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Relocation of jetty to takes into consideration effect on operations of all stakeholders. Jetty relocated to the east, away from Cemex facilities. Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

Pre Control - People				
Severity Probability Risk Score Risk Bar				
3	High			

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
2	4	8	Moderate	

Pre Control - Operational Impact				
Severity Probability Risk Score Risk E				
3	4	12	High	

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	4	8	Moderate

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions

• River (Amendment) Byelaws 2006 - Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41

• Ship Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Assessment

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF
- AIS analysis of Cory track movements has been
- Analysis of Cemex current operations at this site

t Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-
n undertaken.
te has been conducted.

4A - LTTKS - Contact - Commercial Freight Operator with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
4A - LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

Proposed Additional Mitigation

- The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is therefore assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety.
- Notice to Mariners to inform river users of duration and extent of works at this site.
- Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

ocated jetty position.

	5A - LTTKS - Contac	- High Speed Passenger	Vessel with Jetty
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Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
5A - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
3	3	9	Moderate		

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London •
- River Byelaws 1978 (as amended) •
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
3	2	6	Moderate		

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

Proposed Additional Mitigation

- The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is therefore assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety.
- Notice to Mariners to inform river users of duration and extent of works at this site.
- Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

6A - LTTKS - Contact - Class V Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
6A - LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
3	3	9	Moderate		

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
2	3	6	Moderate		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London •
- River Byelaws 1978 (as amended) ٠
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
3	2	6	Moderate		

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2	2	4	Minor		

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Assessment

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

Proposed Additional Mitigation

- The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety.
- Notice to Mariners to inform river users of duration and extent of works at this site.
- Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

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7A - LTTKS - Contact - Private Leisure Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
7A - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tunnel Jetty and associated plant & equipment.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Regular communication and information provided to local leisure users to keep users abreast of Thames Tideway Tunnel activities.

Pre Control - People					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
1	3	Minor			

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3	3 3 9 Moderate					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
2	2 3 6 Moderate					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- River Thames Recreational Users Guide •
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Port Entry Guide

Post Control - People					
Severity Probability Risk Score Risk Band					
3	2	6	Moderate		

Post Control - Environment					
Severity Probability Risk Score Risk B					
1	2	2	Slight		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2	Minor				

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

8A - LTTKS - Contact - Thames Tunnel Vessel with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
8A - LTTKS	Contact - Thames Tunnel Vessel with Nine Elms Marina	A vessel conducting Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon.

Pre Control - People					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
1	Moderate				

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
2	2 3 6 Moderate					

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

ocated jetty position. mes Tideway Tunnel drawing 100-DH-CNS-

9A - LTTKS - Mooring breakout

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
9A - LTTKS	Mooring breakout	A vessel involved in Thames Tunnel activities breaks free temporary/layup moorings.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	 Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure

Pre Control - People					
Severity Probability Risk Score Risk Band					
3	3 3 9 Moderate				

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
2 3 6 Moderate				

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
3	3 3 9 Moderate				

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
2	2 3 6 Moderate				

Relevant PLA Guidance

• Code of Practice for the Safe Mooring of Vessels on the Thames 2010

Post Control - People					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	2	4	Minor

Assessment Notes

 Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

10A - LTTKS - Contact - Thames Tunnel Deconstruction Vessel/Equipment with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
10A - LTTKS	Contact - Thames Tunnel deconstruction vessel/equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

	Pre Contro	ol - People	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control -	Environment	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Relevant PLA Guidance

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Post Control -	Environment	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment

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11A - LTTKS – Collision with Commercial Freight Operator - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
11A - LTTKS	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Vessels operating in close proximity 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure Sub-Contractors Risk Assessment

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2	2	4	Minor		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3	2	6	Moderate		

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2	2	4	Minor		

An a this Con and the

Sub Contractors Risk Assessment					
additional control measure 'Sub Contractors Risk Assessment' has been identified during					
s assessment. The 'Sub Contractors R	isk Assessment' is to be produced by the Sub				
ntractor appointed by the Thames Tu	ntractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations				
berth / jetty management activities. The assessment is to include (but is not limited to)					
e following activities:					
Working at height	Loading / Unloading operations				
Lifting operations Movement of materials					
Slips and trips Mooring					
Fire safety	Welfare Amenities				

12A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
12A - LTTKS	Collision with High Speed	A vessel delivering project construction materials	Misjudgement	Lost Time Injury / Moderate	Boat Masters Licence	 Notice to Mariners to inform river users of duration and extent of works at this
	Passenger	collides with a High Speed Passenger Vessel in the	 Inattention Adverse weather conditions Machinery breakdown 	 permanent partial disability injury Temporary effect / Minor effect to small area 	 BML Local Knowledge Endorsement Qualified Crew 	site.
		vicinity of the Kirtling Street site.		 Moderate damage to vessel / equipment requiring immediate 	 Vessel Master Experience Permanent / Temporary Notice 	Use of reputable marine contractors
		Includes the delivery of Jetty construction material.		repairs Regional coverage 	to Mariners • Aids to Navigation • VTS Navigational Broadcast • HSC Code • Passage Planning	 Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure
					 COLREGs VHF Communications Emergency Plans & Procedures 	 Sub-Contractors Risk Assessment

Pre Control - People							
Severity Probability Risk Score Risk Band							
3	3 3 9 Moderate						

Pre Control - Environment							
Severity Probability Risk Score Risk Band							
2	2 3 6 Moderate						

Pre Control - Operational Impact							
Severity Probability Risk Score Risk Band							
3	3 3 9 Moderate						

Pre Control - Media Attention							
Severity Probability Risk Score Risk Band							
3	3 3 9 Moderate						

	Relevant PLA Guidance
٠	General Directions for Navigation in the Port of London
٠	Schedule to the General Directions for Navigation in the Port of London
•	River Byelaws 1978 (as amended)

- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People						
Severity Probability Risk Score Risk Band						
3 2 6 Moderate						

Post Control - Environment						
Severity Probability Risk Score Risk Band						
2 2 4 Minor						

Post Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
3 2 6 Moderate						

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
3 2 6 Moderate						

An ac this a Conti and the f

Sub Contractors Risk Assessment						
additional control measure 'Sub	dditional control measure 'Sub Contractors Risk Assessment' has been identified during					
assessment. The 'Sub Contract	ors Risk Assessment' is to be produced by the Sub					
tractor appointed by the Tham	es Tunnel Project Team to conduct tug & barge operations					
berth / jetty management activ	berth / jetty management activities. The assessment is to include (but is not limited to)					
following activities:						
Working at height	Loading / Unloading operations					
Lifting operations	Movement of materials					
Slips and trips Mooring						
Fire safety Welfare Amenities						

13A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
13A - LTTKS	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure Sub-Contractors Risk Assessment

Pre Control - People						
Severity Probability Risk Score Risk Band						
3 3 9 Moderate						

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
2	3	6	Moderate		

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3	2	6	Moderate		

An this Con and the

Sub Contractors Risk Assessment				
n additional control measure 'Sub Con	additional control measure 'Sub Contractors Risk Assessment' has been identified during			
is assessment. The 'Sub Contractors R	isk Assessment' is to be produced by the Sub			
ontractor appointed by the Thames Tu	ntractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations			
d berth / jetty management activities. The assessment is to include (but is not limited to)				
e following activities:				
Working at height Loading / Unloading operations				
Lifting operations Movement of materials				
Slips and trips	Mooring			
Fire safety	Welfare Amenities			

14A - LTTKS - Collision with Nine Elms Marina Vessel - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
14A - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure Sub-Contractors Risk Assessment

Pre Control - People					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
1	3	3	Minor		

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3	3 3 9 Moderate					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
3 2 6 Moderate					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
1 2 2 Slight					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Ana this Con and the

Sub Contractors Risk Assessment				
additional control measure 'Sub Cont	tractors Risk Assessment' has been identified during			
is assessment. The 'Sub Contractors R	isk Assessment' is to be produced by the Sub			
ntractor appointed by the Thames Tu	nnel Project Team to conduct tug & barge operations			
d berth / jetty management activities. The assessment is to include (but is not limited to)				
e following activities:				
Working at height	Loading / Unloading operations			
Lifting operations Movement of materials				
Slips and trips Mooring				
Fire safety	Welfare Amenities			

15A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Commercial Freight Operator

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
15A - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment

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16A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
16A - LTTKS	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Relevant P	LA Guidance
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Post Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

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17A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
17A - LTTKS	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People							
Severity Probability Risk Score Risk Band							
Not Assessed	Not Assessed Not Assessed Not Assessed						

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Assessment

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18A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Private Leisure Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
18A - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance

Post Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed Not Assessed Not Assessed Not Assessed				

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Assessment

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19A - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Nine Elms Marina Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
19A - LTTKS	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed				

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Relevant PLA Guidance

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment

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Annex C– Most likely hazard log: Phase B – Jetty operational

C.1 Summary most likely hazard list: Phase B – Jetty operational

Hazard Id	Hazard Title	Hazard Description		Environment	Operational	Media
1B	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	9	6	9	6
2B	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	9	6	9	6
3В	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	9	6	9	6
4B	Contact - Commercial Freight Operator with Jetty	A Commercial Freight Operator makes contact with the Thames Tunnel Jetty.	6	4	6	4
5B	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	6	2	6	6
6B	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	6	2	6	6
7B	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel jetty.	6	2	6	6

8B	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Thames Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	N/ A	N/A	N/A	N/A
9B	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free temporary/layup moorings.	6	4	6	4
10B	Contact - Thames deconstruction equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex		N/A	N/A	N/A
11B	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	9	6	9	9
12B	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	6	4	6	6
13B	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	6	4	6	6
14B	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	9	3	9	9
15B	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	9	6	9	9
16B	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	6	4	6	6
17B	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	6	4	6	6
18B	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	6	4	6	6
19B	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	6	2	6	6

Most likely hazard list - Phase B: Jetty operational **C.2**

1B - LTTKS - Restricted Working - Working Jetty in close proximity to authorised channel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	
1B - LTTKS	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	 Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications VTS Navigational Broadcast Permanent / Temporary Notice to Mariners Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation General Directions Emergency Plans & Procedures COLREGs 	 The original system The original system Notion durate

Pre Control - People					
Severity Probability Risk Score Risk Band					
3	4	12	High		

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3	4	12	High	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 4 8 Moderate					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

	Assessment N
٠	Post Control score takes into consideration relocated
•	Assessment based on jetty location as per Thames Tig

- Ass 257110 Rev AF
- the distance to the authorised channel reduces to approximately 15m.

Proposed Additional Mitigation

design and layout of the proposed new ty at Kirtling Street is greater than 15m away m the authorised channel and is there essed as being sufficiently away from the thorised channel as to not impact on existing vigational safety.

tice to Mariners to inform river users of ration and extent of works at this site.

Notes

d jetty position.

jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-

• The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
2B- LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Final location of jetty takes into consideration effect on operations of all stakeholders. Jetty moved approximately 40m to the east from original proposed location. Notice to Mariners to inform river users of duration and extent of works at this site.

2B - LTTKS - Interaction with Cory Environmental Ltd operations at Cringle Dock

	Pre Contro	ol - People	
Severity	Probability	Risk Score	Risk Band
3	5	15	Extreme

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
2	5	10	High

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
3	5	15	Extreme

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	5	10	High

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

	Post Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

Assessment

- Post Control score takes into consideration relocate
- Consultation with Cory regarding the location and s
- AIS analysis of Cory track movements has been und
- Assessment based on jetty location as per Thames 257110 Rev AF

t Notes
ed jetty position.
size of the jetty has been conducted.
dertaken.
Tideway Tunnel drawing 100-DH-CNS-PWH11-

3B - LTTKS - Interaction with barges using the Cemex jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
3B - LTTKS	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Relocation of jetty to takes into consideration effect on operations of all stakeholders. Jetty relocated approximately 40m east, away from Cory and Cemex facilities. Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People							
Severity Probability Risk Score Risk Band							
3 4 12 High							

Pre Control - Environment							
Severity Probability Risk Score Risk Band							
2 4 8 Moderate							

Pre Control - Operational Impact							
Severity	Risk Score	Risk Band					
3	3 4 12 High						

Pre Control - Media Attention							
Severity	Risk Band						
2	8	Moderate					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions

• River (Amendment) Byelaws 2006 - Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41

• Ship Towage Operations on the Thames

Post Control - People							
Severity Probability Risk Score Risk Band							
3 3 9 Moderate							

Post Control - Environment						
Severity Probability Risk Score Risk Band						
2	3	6	Moderate			

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3 3 9 Moderat						

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
2 3 6 Moderate						

Assessment

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF
- AIS analysis of Cory track movements has been
- Analysis of Cemex current operations at this site

t Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-
n undertaken.
te has been conducted.

4B - LTTKS - Contact - Commercial Freight Operator with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
4B- LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety. Notice to Mariners to inform river users of duration and extent of works at this site. Update PLA charts

Pre Control - People						
Severity Probability Risk Score Risk Ba						
3	3	9	Moderate			

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
2	2 3 6 Moderate					

Pre Control - Operational Impact							
Severity Probability Risk Score Risk Band							
3	3 3 9 Moderate						

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
3	2	6	Moderate		

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 2 4 Mino					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- PWH11-257110 Rev AF

• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-

5B - LTTKS - Contact - High Speed Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
5B - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety. Notice to Mariners to inform river users of duration and extent of works at this site. Update PLA charts

Pre Control - People						
Severity Probability Risk Score Risk Band						
3	3 3 9 Moderate					

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
1	1 3 3 Minor				

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3	3 3 9 Moderate					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People						
Severity	Probability	Risk Score	Risk Band			
3 2 6 Moderate						

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
1	2	2	Slight	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment

- Jetty location is not within the authorised chan
- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF

t Notes
nnel.
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-

6B - LTTKS - Contact - Class V Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
6B- LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety. Notice to Mariners to inform river users of duration and extent of works at this site. Update PLA charts

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
3 3 9 Moderate					

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
1	3	3	Slight	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People						
Severity	Probability	Risk Score	Risk Band			
3 2 6 Moderate						

Post Control - Environment					
Severity Probability Risk Score Risk Band					
1 2 2 Slight					

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment

- Jetty location is not within the authorised chan
- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF

t Notes
nnel.
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-

7B - LTTKS - Contact - Private Leisure Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
7B - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel Jetty and associated plant & equipment.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Regular communication and information provided to local leisure users to keep users abreast of Thames Tideway Tunnel activities. Update PLA charts

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
1	3	3	Slight

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- River Thames Recreational Users Guide •
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Port Entry Guide

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
1	2	2	Slight	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

8B - LTTKS - Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
8B - LTTKS	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	• Not relevant for this phase of the project

Pre Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
Not Assessed	Not Assessed					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Relevant PLA Guidance

Post Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Environment						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Assessment

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9B - LTTKS - Mooring breakout

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
9B - LTTKS	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free from temporary/layup moorings.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew

Pre Control - People						
Severity Probability Risk Score Risk Band						
3	3	9	Moderate			

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3	3 3 9 Moderate				

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
2	2 3 6 Moderate					

• Code of Practice for the Safe Mooring of Vessels on the Thames 2010

Post Control - People					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Assessment Notes

 Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF



10B - LTTKS - Contact - Thames Tunnel Deconstruction Vessel/Equipment with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
10B - LTTKS	Contact - Thames Tunnel deconstruction vessel/equipment Vessel with Nine Elms Marina	A vessel/equipment conducting Tideway Tunnel deconstruction activities makes contact with the Nine Elms Marina complex.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment

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11B - LTTKS - Collision with Commercial Freight Operator - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
11B - LTTKS	Collision with Commercial Freight Operator - Delivery Vessel	A vessel delivering Tideway Tunnel construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Vessels operating in close proximity 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Sub-Contractors Risk Assessment

Pre Control - People						
Severity Probability Risk Score Risk Band						
3	4	12	High			

Pre Control - Environment						
Severity	Probability	Risk Score	Risk Band			
2	4	8	Moderate			

Pre Control - Operational Impact							
Severity	Probability	Risk Score	Risk Band				
3 4 12 High							

Pre Control - Media Attention							
Severity Probability Risk Score Risk Band							
3	4	12	High				

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People							
Severity Probability Risk Score Risk Band							
3	3	9	Moderate				

Post Control - Environment							
Severity Probability Risk Score Risk Band							
2	3	6	Moderate				

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3	3	9	Moderate			

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
3	3	9	Moderate			

Sub Contractors Risk Assessment

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Moveme
Slips and trips	Mooring
Fire safety	Welfare A

- g / Unloading operations nent of materials
- Amenities

12B – LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
12B - LTTKS	Collision with High Speed Passenger Vessel - Delivery Vessel	A vessel delivering Tideway Tunnel construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Permanent / Temporary Notice to Mariners Aids to Navigation VTS Navigational Broadcast HSC Code Passage Planning COLREGs VHF Communications Emergency Plans & Procedures 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Sub-Contractors Risk Assessment

Pre Control - People						
Severity Probability Risk Score Risk Band						
3	3	9	Moderate			

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

	Relevant PLA Guidance
٠	General Directions for Navigation in the Port of London
•	Schedule to the General Directions for Navigation in the Port of London
٠	River Byelaws 1978 (as amended)

- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

An ad this as Contr and b the fo

Sub Contractors Risk Assessment						
dditional control measure 'Sub	ditional control measure 'Sub Contractors Risk Assessment' has been identified during					
assessment. The 'Sub Contracto	ors Risk Assessment' is to be produced by the Sub					
ractor appointed by the Thame	es Tunnel Project Team to conduct tug & barge operations					
berth / jetty management activ	vities. The assessment is to include (but is not limited to)					
following activities:						
Working at height	Loading / Unloading operations					
Lifting operations	Movement of materials					
Slips and trips Mooring						
Fire safety Welfare Amenities						
-						

13B - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
13B - LTTKS	Collision with Class V Passenger Vessel - Delivery Vessel	A vessel delivering Tideway Tunnel construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Sub-Contractors Risk Assessment

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3 2 6 Moderate				

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Sub Contractors Risk Assessment

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Moveme
Slips and trips	Mooring
Fire safety	Welfare A

- g / Unloading operations nent of materials
- Amenities

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
14B - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel – Delivery Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Sub-Contractors Risk Assessment Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon.

Pre Control - People				
Severity Probability Risk Score Risk Band				
3 4 12 High				

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
1 4 4 Minor					

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 4 12 High					

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Relev	ant	PLA	Guida	nce
nerev			Guiaa	nee

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Post Control - Environment					
Severity Probability Risk Score Risk Ba					
1	3	3	Minor		

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Sub Contractors Risk Assessment

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Moveme
Slips and trips	Mooring
Fire safety	Welfare A

ng / Unloading operations ment of materials

e Amenities

15B - LTTKS - Collision T	Thames Tunnel Vessel with	Commercial Freight Operato	r - Delivery Vessel
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Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
15B - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
3	4	12	High	

Relevant PLA Guidance
 General Directions for Navigation in the Port of London
 Schedule to the General Directions for Navigation in the Port of London
 River Byelaws 1978 (as amended)
Permanent Notice to Mariners
Ship Towage Operations on the Thames
Code of Practice Passenger Vessel Operations on the Thames

• Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Post Control - Environment				
Severity	Risk Band			
2	3	6	Moderate	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Sub Contractors Risk Assessment						
ure 'Sub Co	re 'Sub Contractors Risk Assessment' has been identified during					
ontractors	Risk Assessment' is to be produced by the Sub					
e Thames 1	Funnel Project Team to conduct tug & barge operations					
ent activitie	es. The assessment is to include (but is not limited to)					
ht	Loading / Unloading operations					
IS	Movement of materials					
Mooring						
	Welfare Amenities					

An a this Cont and the

Sub Contractors Risk Assessment				
additional control measure 'Sub Contractors Risk Assessment' has been identified during				
assessment. The 'Sub Contractors	Risk Assessment' is to be produced by the Sub			
ntractor appointed by the Thames T	unnel Project Team to conduct tug & barge operations			
l berth / jetty management activitie	berth / jetty management activities. The assessment is to include (but is not limited to)			
following activities:				
Working at height	Loading / Unloading operations			
Lifting operations	Movement of materials			
Slips and trips Mooring				
Fire safety Welfare Amenities				

16B - LTTKS - Co	llision with High Speed	Passenger Vessel -	Excavated Material
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Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

	Relevant PLA Guidance
•	General Directions for Navigation in the Port of London

- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF

Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
17B - LTTKS	Collision with Class V Passenger Vessel - Excavated Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

	Relevant PLA Guidance
•	General Directions for Navigation in the Port of London
•	Schedule to the General Directions for Navigation in the Port of London

- Permanent Notice to Mariners
- Code of Practice Passenger Vessel Operations on the Thames
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners

Post Control - People				
Severity Probability Risk Score Risk Band				
3 2 6 Moderate				

Post Control - Environment				
Severity Probability Risk Score Risk Band				
2 2 4 Minor				

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment Notes			
	Contractors Risk Assessment' has been identified during		
this assessment. The 'Sub Contract	ors Risk Assessment' is to be produced by the Sub		
Contractor appointed by the Tham	es Tunnel Project Team to conduct tug & barge operations		
and berth / jetty management activ	vities. The assessment is to include (but is not limited to)		
the following activities:			
Working at height	Working at height Loading / Unloading operations		
Lifting operations Movement of materials			
Slips and trips Mooring			
Fire safety	Welfare Amenities		

A	Assessment Notes			
dditional control measure 'Sub Cor	ntractors Risk Assessment' has been identified during			
assessment. The 'Sub Contractors I	Risk Assessment' is to be produced by the Sub			
ractor appointed by the Thames T	ractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations			
berth / jetty management activitie	s. The assessment is to include (but is not limited to)			
ollowing activities:				
Working at height	Loading / Unloading operations			
Lifting operations	Movement of materials			
Slips and trips	Mooring			
Fire safety	Welfare Amenities			

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
18B - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

18B - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Private Leisure Vessel

Pre Control - People			
Severity	Risk Band		
3	3	9	Moderate

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
2 3 6 Moderate					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3	3	9	Moderate			

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Permanent Notice to Mariners ٠
- Code of Practice Passenger Vessel Operations on the Thames
- Ship Towage Operations on the Thames ٠
- Code of Practice for Craft Towage Operations on the Thames ٠
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners •

Post Control - People						
Severity Probability Risk Score Risk Band						
3	2	6	Moderate			

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2	2	4	Minor		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3	2	6	Moderate		

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
2	2	4	Minor			

Assessme	n
 Controptore	п

An a this Con and the

Assessment Notes				
additional control measure 'Sub Contractors Risk Assessment' has been identified during				
s assessment. The 'Sub Contractors R	isk Assessment' is to be produced by the Sub			
ntractor appointed by the Thames Tu	innel Project Team to conduct tug & barge operations			
d berth / jetty management activities. The assessment is to include (but is not limited to)				
e following activities:				
Working at height	Loading / Unloading operations			
Lifting operations Movement of materials				
Slips and trips	Mooring			
Fire safety	Welfare Amenities			

19B - LTTKS - Collision Thames Tunnel Vessel with Nine Elms Marina Vessel - Excavated Material

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
19B - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel - Excavated Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon.

Pre Control - People					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
1	3	3	Minor		

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
3 3 9 Moderate						

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Code of Practice Passenger Vessel Operations on the Thames
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Environment				
Severity Probability Risk Score Risk Band				
1	2	2	Slight	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

ocated jetty position. mes Tideway Tunnel drawing 100-DH-CNS-

Annex D– Most likely hazard log: Phase C – Removal of jetty

D.1 Most likely summary hazard list: Phase C - Removal of jetty

Hazard Id	Hazard Title	Hazard Description	People	Environment	Operational	Media
1C	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	6	4	6	4
2C	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	9	6	9	6
3C	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	9	6	9	6
4C	Contact - Commercial Freight Operator with Jetty	A Commercial Freight Operator makes contact with the Thames Tunnel Jetty.	6	4	6	4
5C	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	6	4	6	4
6C	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	6	4	6	4
7C	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel jetty.	6	2	6	6

8C	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Thames Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.		N/A	N/A	N/A
9C	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free temporary/layup moorings.	6	4	6	4
10C	Contact - Thames deconstruction equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	4	4	4	6
11C	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	N/A	N/A	N/A	N/A
12C	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	N/A	N/A	N/A	N/A
13C	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	N/A	N/A	N/A	N/A
14C	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	N/A	N/A	N/A	N/A
15C	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	N/A	N/A	N/A	N/A
16C	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	N/A	N/A	N/A	N/A
17C	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel		N/A	N/A	N/A
18C	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	N/A	N/A	N/A	N/A
19C	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	N/A	N/A	N/A	N/A

Most likely hazard list – Phase C: Removal of jetty **D.2**

1C - LTTKS - Restricted Working - Working Jetty in close proximity to authorised channel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	
1C - LTTKS	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	 Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications VTS Navigational Broadcast Permanent / Temporary Notice to Mariners Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation General Directions Emergency Plans & Procedures COLREGs 	 Notice durati Marin jetty t risk as jetty a

Pre Control - People						
Severity Probability Risk Score Risk Band						
3 4 12 High						

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
2	4	8	Moderate		

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3 4 12 High						

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
2	2	4	Minor	

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3	2	6	Moderate	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF
- The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m.

Proposed Additional Mitigation

ce to Mariners to inform river users of tion and extent of works at this site.

ine contractors tasked with removing the to provide method statement and conduct assessment activities for the removal of the and associated infrastructure.

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
2C - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	 Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

2C - LTTKS - Interaction with Cory Environmental Ltd operations at Cringle Dock

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3 4 12 High				

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
2	4	8	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3 3 9 Moderate				

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

- Post Control score takes into consideration relocate
- Consultation with Cory regarding the location and s
- AIS analysis of Cory track movements has been und
- Assessment based on jetty location as per Thames 257110 Rev AF

t Notes
ed jetty position.
size of the jetty has been conducted.
dertaken.
Tideway Tunnel drawing 100-DH-CNS-PWH11-

3C - LTTKS - Interaction with barges using the Cemex jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
3C - LTTKS	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
2	4	8	Moderate

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	4	8	Moderate

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions

• River (Amendment) Byelaws 2006 - Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41

• Ship Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
2	3	6	Moderate

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF
- AIS analysis of Cory track movements has been
- Analysis of Cemex current operations at this site

t Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-
n undertaken.
te has been conducted.

4C - LTTKS - Contact - Commercial Freight Operator with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
4C - LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People							
Severity Probability Risk Score Risk Band							
3	3	9	Moderate				

Pre Control - EnvironmentSeverityProbabilityRisk ScoreRisk Band236Moderate						
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Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3	9	Moderate				

Pre Control - Media Attention								
Severity Probability Risk Score Risk Band								
2	2 3 6 Moderate							

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People						
Severity Probability Risk Score Risk Band						
3 2 6 Moderate						

Post Control - Environment						
Severity Probability Risk Score Risk Band						
2	4	Minor				

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
3 2 6 Moderate						

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
2 2 2 4 Minor						

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

ocated jetty position. mes Tideway Tunnel drawing 100-DH-CNS-

5C - LTTKS - Contact - High Speed Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
5C - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People							
Severity Probability Risk Score Risk Band							
3 3 9 Moderate							

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	3	6	Moderate		

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
2	3	6	Moderate		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London •
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners •
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2	Minor				

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

6C - LTTKS - Contact - Class V Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
6C - LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
3	3	9	Moderate		

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	3	6	Moderate		

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
2	3	6	Moderate		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London •
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Environment				
Severity Probability Risk Score Risk Band				
2	2	4	Minor	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
2 2 4 Minor					

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

7C - LTTKS - Contact - Private Leisure Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
7C - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tunnel Jetty and associated plant & equipment.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Regular communication and information provided to local leisure users to keep users abreast of Thames Tideway Tunnel activities. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People					
Severity Probability Risk Score Risk Band					
3	3 3 9 Moderate				

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
1	1 3 3 Minor					

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3	3 3 9 Moderate				

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
3 3 9 Moderate				

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- River Thames Recreational Users Guide
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Port Entry Guide

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
1	2	2	Slight	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3	2	6	Moderate		

- Jetty location is not within the authorised channel and the set of the set
- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF

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inel.
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-

8C - LTTKS - Contact - Thames Tunnel Vessel with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
8C - LTTKS	Contact - Thames Tunnel Vessel with Nine Elms Marina	A vessel conducting Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	• Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Relevant PLA Guidance				

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

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9C - LTTKS - Mooring breakout

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
9C - LTTKS	Mooring breakout	A vessel involved in Thames Tunnel activities breaks free temporary/layup moorings.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Temporary effect / Minor effect to small area Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	 Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	 Use of reputable marine contractors Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People							
Severity Probability Risk Score Risk Band							
3 3 9 Moderate							

Pre Control - Environment							
Severity Probability Risk Score Risk Band							
2 3 6 Moderate							

Pre Control - Operational Impact							
Severity Probability Risk Score Risk Band							
3 3 9 Moderate							

Pre Control - Media Attention							
Severity Probability Risk Score Risk Band							
2 3 6 Moderate							

Relevant PLA Guidance

• Code of Practice for the Safe Mooring of Vessels on the Thames 2010

Post Control - People							
Severity Probability Risk Score Risk Band							
3 2 6 Moderate							

Post Control - Environment							
Severity Probability Risk Score Risk Band							
2 2 4 Minor							

Post Control - Operational Impact							
Severity Probability Risk Score Risk Band							
3 2 6 Moderate							

Post Control - Media Attention							
Severity Probability Risk Score Risk Band							
2 2 4 Minor							

Assessment Notes

 Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

10C - LTTKS - Contact - Thames Tunnel Deconstruction Vessel/Equipment with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
10C - LTTKS	Contact - Thames Tunnel deconstruction vessel/equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty and associated infrastructure makes contact with the Nine Elms Marina complex	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional Coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People							
Severity Probability Risk Score Risk Band							
2 3 6 Moderate							

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
1	3	6	Moderate	

Pre Control - Operational Impact							
Severity Probability Risk Score Risk Band							
2	2 3 6 Moderate						

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
2	2	4	Minor	

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
2	2	4	Minor	

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
3	2	6	Moderate	

Assessment

 Assessment based on jetty location as per Thar PWH11-257110 Rev AF

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• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
11A - LTTKS	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project
		site. Includes the delivery of Jetty construction material.				

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance	
	Relevant PLA Guidance

Post Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

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12C - LTTKS - Collision - Thames	Tunnel Vessel/Equipment with	High Speed Passenger Vessel
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Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
12C - LTTKS	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Relevant PLA Guidance		

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

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Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
13C - LTTKS	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Relevant PLA Guidance					

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

۲	Notes
	NULES

14C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
14C - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Relevant PLA Guidance			

Post Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment

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	NULES

15C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Commercial Freight Operator

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
15C - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People							
Severity Probability Risk Score Risk Band							
Not Assessed	Not Assessed Not Assessed Not Assessed						

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Relevant PLA Guidance

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment

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16C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
16C - LTTKS	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Assessment

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17C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
17C - LTTKS	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Assessment

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18C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Private Leisure Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
18C - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Post Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment

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19C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Nine Elms Marina Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
19C - LTTKS	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Relevant PLA Guidance

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment

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Annex E– Worst credible hazard log: Phase A - Construction of jetty

E.1 Worst credible summary hazard list: Phase A - Construction of jetty

Hazard Id	Hazard Title	Hazard Description		Environment	Operational	Media
1D	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	10	6	10	10
2D	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	15	9	15	12
3D	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	15	9	15	12
4D	Contact - Commercial Freight Operator with Jetty	A Commercial Freight Operator makes contact with the Thames Tunnel Jetty.	10	6	10	8
5D	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	10	6	10	10
6D	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	10	6	10	10
7D	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel jetty.	10	4	10	10

8D	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Thames Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	8	4	8	6
9D	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free temporary/layup moorings.	8	4	8	6
10D	Contact - Thames deconstruction equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	N/A	N/A	N/A	N/
11D	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site.	10	6	10	8
12D	Collision with High Speed Passenger Vessel	Includes the delivery of Jetty construction material. A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	10	6	10	1
13D	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	10	6	10	1
14D	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.		6	10	1
15D	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	N/A	N/A	N/A	N
16D	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel		N/A	N/A	N
17D	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	N/A	N/A	N/A	N
18D	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	N/A	N/A	N/A	N
19D	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	N/A	N/A	N/A	N

Wost credible hazard list – Phase A: Construction of jetty **E.2**

1D - LTTKS - Restricted Working - Working Jetty in close proximity to authorised channel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	
1D - LTTKS	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	 Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications VTS Navigational Broadcast Permanent / Temporary Notice to Mariners Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation General Directions Emergency Plans & Procedures COLREGs 	 The deat Kirtle the autority being so channed safety. Notice duration Marined jetty to risk asset the jet

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London

Pilotage Directions

- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
3	2	6	Moderate		

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	2	8	Moderate	

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF
- the distance to the authorised channel reduces to approximately 15m.

Proposed Additional Mitigation

design and layout of the proposed new jetty rtling Street is greater than 15m away from authorised channel and is there assessed as g sufficiently away from the authorised nnel as to not impact on existing navigational ty.

ce to Mariners to inform river users of tion and extent of works at this site.

ine contractors tasked with constructing to provide method statement and conduct ssessment activities for the construction of etty and associated infrastructure

• The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
2D - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	 Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs

2D - LTTKS - Interaction with Cory Environmental Ltd operations at Cringle Dock

Pre Control - People					
Severity Probability Risk Score Risk Band					
5	4	20	Extreme		

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
3	4	12	High		

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	4	20	Extreme		

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	4	16	Extreme		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	
5	3	15	Extreme	

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	3	15	Extreme		

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	3	12	High		

- Post Control score takes into consideration relocate
- Consultation with Cory regarding the location and si
- AIS analysis of Cory track movements has been under
- Assessment based on jetty location as per Thames 257110 Rev AF

Proposed Additional Mitigation
 Final location of jetty takes into consideration effect on operations of all stakeholders.
 Notice to Mariners to inform river users of duration and extent of works at this site.
 Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

Notes
ed jetty position.
size of the jetty has been conducted.
dertaken.
Tideway Tunnel drawing 100-DH-CNS-PWH11-

	3D - LTTKS -	Interaction with	barges using	the Cemex	jetty
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Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
3D - LTTKS	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Relocation of jetty to takes into consideration effect on operations of all stakeholders. Jetty relocated to the east, away from Cemex facilities. Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

	Pre Contro	ol - People	
Severity	Probability	Risk Score	Risk Band
5	4	20	Extreme

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	4	12	High

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
5	4	20	Extreme

	Pre Control - N	Iedia Attention	
Severity	Probability	Risk Score	Risk Band
4	4	16	Extreme

Relevant PLA Guidance	
 General Directions for Navigation in the Port of London 	
 Schedule to the General Directions for Navigation in the Port of London 	
Pilotage Directions	
• River (Amendment) Byelaws 2006 - Thames AIS Byelaws and Revocation of River By	yelaws 6, 8 and
41	

• Ship Towage Operations on the Thames

	Post Contr	ol - People	
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

	Post Control -	Environment	
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
4	3	12	High

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF
- AIS analysis of Cory track movements has been
- Analysis of Cemex current operations at this site

t Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-
n undertaken.
te has been conducted.

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
4D - LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs

4D - LTTKS - Contact - Commercial	Freight Operator with Jetty
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Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Pre Control - Operational Impact				
Severity	Risk Score	Risk Band		
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Post Control - Environment						
Severity Probability Risk Score Risk Band						
3	2	6	Moderate			

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	2	8	Moderate		

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

Proposed Additional Mitigation
 The design and layout of the proposed new jetty at Kirtling Street is greater
than 15m away from the authorised
channel and is therefore assessed as being sufficiently away from the
authorised channel as to have a minimal impact on existing navigational safety.
Notice to Mariners to inform river users
of duration and extent of works at this site.
Marine contractors tasked with
constructing jetty to provide method

statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
5D - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
5 3 15 Extreme					

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
3 3 9 Moderate					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
5 3 15 Extreme						

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended) ٠
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5 2 10 High					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
5	2	10	High	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5 2 10 High				

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

- The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is therefore assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety.
- Notice to Mariners to inform river users of duration and extent of works at this site.
- Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

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6D - LTTKS - Contact - Class V Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
6D - LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
5 3 15 Extreme					

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended) ٠
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People				
Severity	Severity Probability Risk Score			
5	2	10	High	

Post Control - Environment				
Severity	Severity Probability Risk Score		Risk Band	
3	2	6	Moderate	

Post Control - Operational Impact				
Severity	Risk Score	Risk Band		
5	2	10	High	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

- The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety.
- Notice to Mariners to inform river users of duration and extent of works at this site.
- Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure.

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7D - LTTKS - Contact - Private Leisure Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
7D - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tunnel Jetty and associated plant & equipment.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Regular communication and information provided to local leisure users to keep users abreast of Thames Tideway Tunnel activities.

Pre Control - People						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Pre Control - Environment						
Severity	Probability	Risk Score	Risk Band			
2	3	6	Moderate			

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Pre Control - Media Attention						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- River Thames Recreational Users Guide
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Port Entry Guide

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Post Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
5	2	10	High			

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

8D - LTTKS - Contact - Thames Tunnel Vessel with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
8D - LTTKS	Contact - Thames Tunnel Vessel with Nine Elms Marina	A vessel conducting Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Single Fatality / Severe permanent partial disability Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings Regional coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon.

Pre Control - People						
Severity	Probability	Risk Score	Risk Band			
4	3	12	High			

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	3	6	Moderate		

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
3	3 3 9 Moderate				

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2	2	4	Minor		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

9D - LTTKS - Mooring breakout

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
9D - LTTKS	Mooring breakout	A vessel involved in Thames Tunnel activities breaks free temporary/layup moorings.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Single Fatality / Severe permanent partial disability Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings Regional coverage 	 Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	 Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure

Pre Control - People				
Severity Probability Risk Score Risk Band				
4 3 12 High				

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
4	3	12	High	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Relevant PLA Guidance

• Code of Practice for the Safe Mooring of Vessels on the Thames 2010

Post Control - People					
Severity Probability Risk Score Risk Band					
4 2 8 Moderat					

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment Notes

 Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

10D - LTTKS - Contact - Thames Tunnel Deconstruction Vessel/Equipment with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
10D - LTTKS	Contact - Thames Tunnel deconstruction vessel/equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

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11D - LTTKS – Collision with Commercial Freight Operator - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
11D - LTTKS	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Vessels operating in close proximity 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure Sub-Contractors Risk Assessment

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Pre Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

	Pre Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
4	3	12	High

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
4	2	8	Moderate

An a this Cont and the

Sub Contractors Risk Assessment				
additional control measure 'Sub Contractors Risk Assessment' has been identified during				
s assessment. The 'Sub Contractor	's Risk Assessment' is to be produced by the Sub			
ntractor appointed by the Thames	Tunnel Project Team to conduct tug & barge operations			
d berth / jetty management activit	berth / jetty management activities. The assessment is to include (but is not limited to)			
e following activities:				
Working at height Loading / Unloading operations				
Lifting operations	Movement of materials			
Slips and trips Mooring				
Fire safety	Welfare Amenities			

12D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
12D - LTTKS	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Permanent / Temporary Notice to Mariners Aids to Navigation VTS Navigational Broadcast HSC Code Passage Planning COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure
					 VHF Communications Emergency Plans & Procedures 	 Sub-Contractors Risk Assessment

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Pre Control - Environment					
Severity Probability Risk Score Ris					
3	3	9	Moderate		

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Pre Control - Media Attention Severity Probability Risk Score Risk Band					

Relevant PLA Guidance				
 General Directions for Navigation in the Port of London 				
 Schedule to the General Directions for Navigation in the Port of London 				
River Byelaws 1978 (as amended)				
Permanent Notice to Mariners				
Ship Towage Operations on the Thames				

- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Environment						
Severity Probability Risk Score Risk Band						
3	2	6	Moderate			

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
5	2	10	High			

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
5	2	10	High			

Sub Contractors Risk Assessment						
An additional control measure 'Sub	An additional control measure 'Sub Contractors Risk Assessment' has been identified during					
this assessment. The 'Sub Contracto	ors Risk Assessment' is to be produced by the Sub					
,	es Tunnel Project Team to conduct tug & barge operations ities. The assessment is to include (but is not limited to)					
Working at height	Loading / Unloading operations					
Lifting operations	Movement of materials					
Slips and trips Mooring						
Fire safety Welfare Amenities						

13D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
13D - LTTKS	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure Sub-Contractors Risk Assessment

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
5	3	15	Extreme	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
3	Moderate			

Post Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5 2 10 High					

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
5	2	10	High	

An a this Con and the

Sub Contractors Risk Assessment				
additional control measure 'Sub Contractors Risk Assessment' has been identified during				
s assessment. The 'Sub Contractors R	lisk Assessment' is to be produced by the Sub			
ntractor appointed by the Thames Tu	Innel Project Team to conduct tug & barge operations			
berth / jetty management activities. The assessment is to include (but is not limited to)				
e following activities:				
Working at height	Loading / Unloading operations			
Lifting operations	Movement of materials			
Slips and trips Mooring				
Fire safety	Welfare Amenities			

14D - LTTKS - Collision with Nine Elms Marina Vessel - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
14D - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Single Fatality / Severe permanent partial disability Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Marine contractors tasked with constructing jetty to provide method statement and conduct risk assessment activities for the construction of the jetty and associated infrastructure Sub-Contractors Risk Assessment

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5 3 15 Extreme				

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
4	2	8	Moderate	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
5 2 10 High					

An a this Cont and the

Sub Con	Sub Contractors Risk Assessment					
additional control measure 'Sub Cor	ntractors Risk Assessment' has been identified during					
s assessment. The 'Sub Contractors I	Risk Assessment' is to be produced by the Sub					
ntractor appointed by the Thames T	unnel Project Team to conduct tug & barge operations					
berth / jetty management activities. The assessment is to include (but is not limited to)						
e following activities:						
Working at height	Loading / Unloading operations					
Lifting operations	Lifting operations Movement of materials					
Slips and trips Mooring						
Fire safety	Welfare Amenities					
-						

15D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Commercial Freight Operator

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
15D- LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People						
Severity	Probability	Risk Score	Risk Band			
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

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16D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
16D - LTTKS	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Relevant PLA G	uidance
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Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Post Control -	Environment	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Post Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment

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17D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
17D - LTTKS	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

	Pre Contro	ol - People	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control -	Environment	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

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Post Control - People					
Severity	Probability	Risk Score	Risk Band		
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

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18D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Private Leisure Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
18D - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed						

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

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19D - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Nine Elms Marina Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
19D - LTTKS	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

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Annex F– Worst credible hazard log: Phase B – Jetty operational

F.1 Summary worst credible hazard list: Phase B – Jetty operational

Hazard Id	Hazard Title	Hazard Description	People	Environment	Operational	Media
1E	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	10	6	10	8
2E	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	10	6	10	8
3E	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	10	6	10	8
4E	Contact - Commercial Freight Operator with Jetty	A Commercial Freight Operator makes contact with the Thames Tunnel Jetty.	10	6	10	8
5E	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	10	6	10	10
6E	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	10	6	10	10
7E	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel jetty.	10	4	10	10

8E	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Thames Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	N/A	N/A	N/A	N/A
9E	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free temporary/layup moorings.	8	4	8	6
10E	Contact - Thames deconstruction equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	N/A	N/A	N/A	N/A
11E	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	10	6	10	8
12E	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	10	6	10	10
13E	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	10	6	10	10
14E	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	8	6	10	10
15E	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	10	8	10	8
16E	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	10	6	10	10
17E	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	10	6	10	10
18E	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	10	4	10	10
19E	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	10	6	10	10

Worst credible hazard list - Phase B: Jetty operational **F.2**

1E - LTTKS - Restricted Working - Working Jetty in close proximity to authorised channel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	
1E - LTTKS	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	 Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications VTS Navigational Broadcast Permanent / Temporary Notice to Mariners Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation General Directions Emergency Plans & Procedures COLREGs 	 The jetty from asse auth navig Notion dura

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

	Assessment Notes
•	Post Control score takes into consideration relocated jetty

- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF
- The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m.

Proposed Additional Mitigation

e design and layout of the proposed new ty at Kirtling Street is greater than 15m away m the authorised channel and is there essed as being sufficiently away from the thorised channel as to not impact on existing vigational safety.

tice to Mariners to inform river users of ration and extent of works at this site.

ty position.

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
2E- LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory	 Proximity of Thames Tunnel jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Final location of jetty takes into consideration effect on operations of all stakeholders. Jetty moved approximately 40m to the east from original proposed location. Notice to Mariners to inform river users of duration and extent of works at this site.
		operations, a river incident occurs.				

	Pre Contro	ol - People	
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

	Pre Control -	Environment	
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

	Pre Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
4	3	12	High

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

	Post Contr	ol - People	
Severity	Probability	Risk Score	Risk Band
5	2	10	High

	Post Control -	Environment	
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

	Post Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
5	2	10	High

	Post Control - N	Nedia Attention	
Severity	Probability	Risk Score	Risk Band
4	2	8	Moderate

- Post Control score takes into consideration relocate
- Consultation with Cory regarding the location and si
- AIS analysis of Cory track movements has been under
- Assessment based on jetty location as per Thames 257110 Rev AF

Notes
ed jetty position.
size of the jetty has been conducted.
dertaken.
Tideway Tunnel drawing 100-DH-CNS-PWH11-

3E - LTTKS - Interaction with barges using the Cemex jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
3E - LTTKS	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Relocation of jetty to takes into consideration effect on operations of all stakeholders. Jetty relocated approximately 40m east, away from Cory and Cemex facilities. Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Pre Control - Environment				
Severity Probability Risk Score Risk Ba				
3	3	9	Moderate	

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Pre Control - Media Attention					
Severity Probability Risk Score Risk Ban					
4	3	12	High		

Relevant PLA Guidance
 General Directions for Navigation in the Port of London
 Schedule to the General Directions for Navigation in the Port of London
Pilotage Directions
• River (Amendment) Byelaws 2006 - Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and
41
 Ship Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment						
Severity Probability Risk Score Risk Band						
3	2	6	Moderate			

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	2	8	Moderate		

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Tham PWH11-257110 Rev AF
- AIS analysis of Cory track movements has been
- Analysis of Cemex current operations at this site

t Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-
n undertaken.
te has been conducted.

4E - LTTKS - Contact - Commercial Freight Operator with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
4E- LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety. Notice to Mariners to inform river users of duration and extent of works at this site. Update PLA charts

Pre Control - People						
Severity Probability Risk Score Risk Band						
5	5 3 15 Extreme					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5 2 10 High					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5 2 10 High					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

- Post Control score takes into consideration rele
- Assessment based on jetty location as per Thar PWH11-257110 Rev AF

t Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-

5E - LTTKS - Contact - High Speed Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
5E - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety. Notice to Mariners to inform river users of duration and extent of works at this site. Update PLA charts

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
5 3 15 Extreme					

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
3	3	9	Moderate	

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5 3 15 Extreme					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
5 3 15 Extreme					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People					
Severity Probability Risk Score Risk Band					
5 2 10 High					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5 2 10 High				

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
5 2 10 High					

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

ţ	Ν	0	te	S

6E - LTTKS - Contact - Class V Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
6E- LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 The design and layout of the proposed new jetty at Kirtling Street is greater than 15m away from the authorised channel and is there assessed as being sufficiently away from the authorised channel as to have a minimal impact on existing navigational safety. Notice to Mariners to inform river users of duration and extent of works at this site. Update PLA charts

	Pre Control - People					
Severity Probability Risk Score Risk Band						
	5	3	15	Extreme		

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
3	3 3 9 Moderate					

Pre Control - Operational Impact						
Severity Probability Risk Score Risk Band						
5	5 3 15 Extreme					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
5 3 15 Extreme					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

7E - LTTKS - Contact - Private Leisure Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
7E - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel Jetty and associated plant & equipment.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention 	 Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience 	• Notice to Mariners to inform river users of duration and extent of works at this site.
			 Adverse weather conditions Machinery breakdown Collision avoidance 	vessel or equipment possible criminal proceedings • International coverage	 Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Regular communication and information provided to local leisure users to keep users abreast of Thames Tideway Tunnel activities. Update PLA charts

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners •
- River Thames Recreational Users Guide
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Port Entry Guide

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

8E - LTTKS - Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
8E - LTTKS	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	• Not relevant for this phase of the project

Pre Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed			

Relevant PLA Guidance	

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment Notes

9E - LTTKS - Mooring breakout

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
9E - LTTKS	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free from temporary/layup moorings.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Single Fatality / Severe permanent partial disability Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings Regional coverage 	 Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
4 3 12 High				

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
2	2 3 6 Moderate					

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
4	3	12	High		

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
3 3 9 Moderate					

Relevant PLA Guidance

• Code of Practice for the Safe Mooring of Vessels on the Thames 2010

Post Control - People					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
2 2 2 4 Minor					

Post Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
4 2 8 Moderate					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Assessment Notes

 Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF



10E - LTTKS - Contact - Thames Tunnel Deconstruction Vessel/Equipment with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
10E - LTTKS	Contact - Thames Tunnel deconstruction vessel/equipment Vessel with Nine Elms Marina	A vessel/equipment conducting Tideway Tunnel deconstruction activities makes contact with the Nine Elms Marina complex.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
Not Assessed Not Assessed Not Assessed					

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed Not Assessed Not Assessed Not Assessed				

Relevant PLA Guidance	

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Assessment Notes

Proposed Additional Mitigation
 Not relevant for this phase of the project

11E - LTTKS - Collision with Commercial Freight Operator - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
11E - LTTKS	Collision with Commercial Freight Operator - Delivery Vessel	A vessel delivering Tideway Tunnel construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Vessels operating in close proximity 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Sub-Contractors Risk Assessment

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

	Post Contr	ol - People	
Severity	Probability	Risk Score	Risk Band
5	2	10	High

	Post Control -	Environment	
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

	Post Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
5	2	10	High

	Post Control - N	Iedia Attention	
Severity	Probability	Risk Score	Risk Band
4	2	8	Moderate

Sub Contractors Risk Assessment

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Moveme
Slips and trips	Mooring
Fire safety	Welfare A

/ Unloading operations ent of materials

Amenities

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
12E - LTTKS	Collision with High Speed Passenger Vessel - Delivery Vessel	A vessel delivering Tideway Tunnel construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Permanent / Temporary Notice to Mariners Aids to Navigation VTS Navigational Broadcast HSC Code Passage Planning COLREGs VHF Communications Emergency Plans & Procedures

	Pre Contro	ol - People	
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

	Pre Control -	Environment	
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

	Pre Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

ſ	Relevant PLA Guidance
	General Directions for Navigation in the Port of London
	 Schedule to the General Directions for Navigation in the Port of London
	River Byelaws 1978 (as amended)

- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5 2 10 High					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
5 2 10 High					

S	ub Contractors Risl
An additional control measure 'Sub	Contractors Risk As
assessment. The 'Sub Contractors Ri	sk Assessment' is to
by the Thames Tunnel Project Team	to conduct tug & b
activities. The assessment is to inclu	de (but is not limite
Working at height	Loading / Unl
Lifting operations	Movement of
Slips and trips	Mooring
Fire safety	Welfare Amer

Proposed Additional Mitigation
• Notice to Mariners to inform river users of duration and extent of works at this site.
Use of reputable marine contractors
• Sub-Contractors Risk Assessment

sk Assessment

ssessment' has been identified during this to be produced by the Sub Contractor appointed barge operations and berth / jetty management ted to) the following activities:

- nloading operations
- of materials

enities

13E - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
13E - LTTKS	Collision with Class V Passenger Vessel - Delivery Vessel	A vessel delivering Tideway Tunnel construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Use of reputable marine contractors Sub-Contractors Risk Assessment

Pre Control - People					
Severity	Probability	Risk Score	Risk Band		
5	5 3 15 Extreme				

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
3	3 3 9 Moderate				

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
5	5 3 15 Extreme				

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Sub Contractors Risk Assessment

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Moveme
Slips and trips	Mooring
Fire safety	Welfare A

/ Unloading operations ent of materials

Amenities

14E - LTTKS - Collision with Nine Elms Marina Vessel - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
14E - LTTKS	Collision Thames Tunnel Vessel with Nine	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention 	 Single Fatality / Severe permanent partial disability Short to medium term impact Very serious damage to vessel or 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience 	• Notice to Mariners to inform river users of duration and extent of works at this site.
	Elms Marina Vessel – Delivery Vessel	vicinity of the Kirtling Street site.	 Adverse weather conditions Machinery breakdown Collision avoidance River incident 	equipment possible criminal proceedings • International coverage	 Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice 	 Use of reputable marine contractors Sub-Contractors Risk Assessment
					 Aids to Navigation Emergency Plans & Procedures COLREGs 	• Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon.

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
4	3	12	High

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Pre Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Relevant PLA Guidance	

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
4	2	8	Moderate

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
5	2	10	High	

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Sub Contractors Risk Assessment

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Movemer
Slips and trips	Mooring
Fire safety	Welfare A

g / Unloading operations nent of materials

Amenities

15E - LTTKS - Collision Thames Tunnel Vessel with Commercial Freight Operator - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
15E - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	 Multiple fatalities Medium to long term effect / large area affected Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
4	3	12	High

Pre Control - Operational Impact				
Severity Probability Risk Score Risk Band				
5	3	15	Extreme	

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
4	3	12	High

Relevant PLA Guidance		
General Directions for Navigation in the Port of London		
 Schedule to the General Directions for Navigation in the Port of London 		
River Byelaws 1978 (as amended)		
Permanent Notice to Mariners		
Shin Towago Operations on the Thamas		

- Ship Towage Operations on the Thames
- Code of Practice Passenger Vessel Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Environment			
Severity Probability Risk Score Risk Band			
4	2	8	Moderate

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
4	2	8	Moderate

Sub	Contractors Risk Assessment				
An additional control measure 'Sub	Contractors Risk Assessment' has been identified during				
this assessment. The 'Sub Contracto	ors Risk Assessment' is to be produced by the Sub				
Contractor appointed by the Thame	es Tunnel Project Team to conduct tug & barge operations				
and berth / jetty management activ	ities. The assessment is to include (but is not limited to)				
the following activities:					
Working at height	Loading / Unloading operations				
Lifting operations	Movement of materials				
Slips and trips	Mooring				
Fire safety	Welfare Amenities				

16E - LTTKS - Collision with High Speed Passenger Vessel - Excavated Material

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
H F	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	3	9	Moderate

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
3	2	6	Moderate

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Assessment

- Post Control score takes into consideration relocated jetty position.
- PWH11-257110 Rev AF

Notes	

• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-

17E - LTTKS - Collision with Class V Passenger Vessel - Excavated Material

Hazard ID Ha	azard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
Clas Pass Vess	ssenger ssel - cavated	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Pre Control - Environment						
Severity	Probability	Risk Score	Risk Band			
3	3	9	Moderate			

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Pre Control - Media Attention						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Permanent Notice to Mariners ٠
- Code of Practice Passenger Vessel Operations on the Thames ٠
- Ship Towage Operations on the Thames •
- Code of Practice for Craft Towage Operations on the Thames •
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners •

Post Control - People						
Severity	Probability	Risk Score	Risk Band			
5	2	10	High			

Post Control - Environment						
Severity	Probability	Risk Score	Risk Band			
3	2	6	Moderate			

Post Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Media Attention						
Severity	Probability	Risk Score	Risk Band			
5	2	10	High			

Assessment Notes

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height	Loading /
Lifting operations	Movemei
Slips and trips	Mooring
Fire safety	Welfare A

/ Unloading operations ent of materials

Amenities

18E - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Private Leisure Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
18E - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	 Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Light Warnings - providing visual warning that barge is about to depart jetty Sound Warnings - providing audio warning that barge is about to depart jetty Use of reputable and experienced marine contractor Sub-Contractors Risk Assessment Berth Master Notice to Mariners to inform river users of duration and extent of works at this site.

Pre Control - People						
Severity	Probability	Risk Score	Risk Band			
5	3	15	Extreme			

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
2	3	6	Moderate		

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Permanent Notice to Mariners
- Code of Practice Passenger Vessel Operations on the Thames
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Post Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Assessment Notes

An additional control measure 'Sub Contractors Risk Assessment' has been identified during this assessment. The 'Sub Contractors Risk Assessment' is to be produced by the Sub Contractor appointed by the Thames Tunnel Project Team to conduct tug & barge operations and berth / jetty management activities. The assessment is to include (but is not limited to) the following activities:

Working at height Lifting operations Slips and trips Fire safety Loading / Unloading operations Movement of materials Mooring Welfare Amenities

19E - LTTKS - Collision Thames Tunnel Vessel with Nine Elms Marina Vessel - Excavated Material

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
19E - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel - Excavated Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	 Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon.

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
2	3	6	Moderate		

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Code of Practice Passenger Vessel Operations on the Thames
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
2	2	6	Minor	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
5	High				

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- PWH11-257110 Rev AF

• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-

Annex G– Worst credible hazard log: Phase C – Removal of jetty

G.1 Worst credible summary hazard list: Phase C - Removal of jetty

Hazard Id	Hazard Title	Hazard Description	People	Environment	Operational	Media
1F	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	10	6	10	8
2F	Interaction with Cory Environmenta I Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	15	9	15	12
3F	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	15	9	15	12

4F	Contact - Commercial Freight Operator with Jetty	A Commercial Freight Operator makes contact with the Thames Tunnel Jetty.	10	6	10	8
5F	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	10	6	10	10
6F	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tideway Tunnel jetty.	10	6	10	10
7F	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tideway Tunnel jetty.	10	4	10	10
8F	Contact - Thames Tideway Tunnel Vessel with Nine Elms Marina	A vessel conducting Thames Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	N/A	N/A	N/A	N/A
9F	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free temporary/layup moorings.	8	4	8	6
10F	Contact - Thames deconstructio n equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty makes contact with the Nine Elms Marina complex	8	4	8	10
11F	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	N/A	N/A	N/A	N/A

High Speed materials collides with a High Speed Passenger Passenger Vessel in the vicinity of the Kirtling N/A 12F Vessel N/A N/A N/A Street site. Includes the delivery of Jetty construction material. A vessel delivering project construction Collision with Class V materials collides with a Class V Passenger Passenger Vessel in the vicinity of the Kirtling Street 13F Vessel site. N/A N/A N/A N/A Includes the delivery of Jetty construction material. A vessel delivering project construction Collision Thames material collides with a Nine Elms Marina **Tunnel Vessel** House Boat in the vicinity of the Kirtling 14F N/A N/A N/A N/A with Nine Street site. Elms Marina Vessel Collision with A vessel taking excavated material away from the Kirtling Street site collides with a Commercial 15F N/A N/A N/A N/A Freight Commercial Freight Operator Operator

A vessel delivering project construction

	•					
16F	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	N/A	N/A	N/A	N/A
17F	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	N/A	N/A	N/A	N/A
18F	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	N/A	N/A	N/A	N/A
19F	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	N/A	N/A	N/A	N/A

Collision with

Worst credible hazard list – Phase C: Removal of jetty **G.2**

1F - LTTKS - Restricted Working - Working Jetty in close proximity to authorised channel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	
1F - LTTKS	Restricted Working - Working jetty in close proximity to authorised channel	The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m. Intrusion into authorised channel constrains available water space for existing traffic. Due to the reduced channel width a river incident occurs.	 Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 Boat Masters Licence BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications VTS Navigational Broadcast Permanent / Temporary Notice to Mariners Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation General Directions Emergency Plans & Procedures COLREGs 	 Notice duration Marino jetty to risk as jetty a

Pre Control - People					
Severity	Risk Band				
5	3	15	Extreme		

Pre Control - Environment					
Severity	Probability	Risk Score	Risk Band		
3	3	9	Moderate		

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	3	12	High		

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
3	2	6	Moderate		

Post Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
4	2	8	Moderate		

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- 257110 Rev AF
- The jetty will be approximately 25m from the authorised channel, with a barge alongside the jetty the distance to the authorised channel reduces to approximately 15m.

Proposed Additional Mitigation

ce to Mariners to inform river users of tion and extent of works at this site.

ine contractors tasked with removing the to provide method statement and conduct assessment activities for the removal of the and associated infrastructure.

• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-

2F - LTTKS - Interaction with Cory Environmental Ltd operations at Cringle Dock

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
2F - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility. It is expected that Thames Tideway Tunnel barges and Cory barges will be operating in the area in close proximity and at the same time. Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service. Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.	 Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	4	20	Extreme	

Pre Control - Environment					
Severity	Risk Band				
3	4	12	High		

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	4	20	Extreme	

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	4	16	Extreme		

Relevant PLA Guidance
General Directions for Navigation in the Port of London
 Schedule to the General Directions for Navigation in the Port of London

- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5	3	15	Extreme		

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3	3	9	Moderate		

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
5 3 15 Ext						

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4	3	12	High		

Assessment Notes
eration relocated jetty position.
e location and size of the jetty has been conducted.
ts has been undertaken.
as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-

- Post Control score takes into consideration relocate
- Consultation with Cory regarding the location and
- AIS analysis of Cory track movements has been un
- Assessment based on jetty location as per Thames 257110 Rev AF

3F - LTTKS - Interaction with barges using the Cemex jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
3F - LTTKS	Interaction with barges using the Cemex jetty	The proposed jetty is situated directly in front of Cemex's jetty. This jetty is used by barges for the delivery of aggregates. The position of the jetty would make it extremely difficult to manoeuvre barges onto the Cemex jetty. Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.	 Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People				
	Severity	Probability	Risk Score	Risk Band
	5	4	20	Extreme

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	4	12	High	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	4	20	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	4	16	Extreme	

Γ	Relevant PLA Guidance
	General Directions for Navigation in the Port of London
	 Schedule to the General Directions for Navigation in the Port of London

- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Post Control - Environment				
Severity	Risk Band			
3	3	9	Moderate	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	3	15	Extreme		

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
4	3	12	High	

Assessment

- Post Control score takes into consideration relo
- Assessment based on jetty location as per Than PWH11-257110 Rev AF
- AIS analysis of Cory track movements has been
- Analysis of Cemex current operations at this site

Notes
ocated jetty position.
mes Tideway Tunnel drawing 100-DH-CNS-
n undertaken.
te has been conducted.

4F - LTTKS - Contact - Commercial Freight Operator with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
4F - LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
3	3 3 9 Moderate					

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
5	5 3 15 Extreme					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
4 3 12 High					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- Pilotage Directions
- River (Amendment) Byelaws 2006 Thames AIS Byelaws and Revocation of River Byelaws 6, 8 and 41
- Ship Towage Operations on the Thames

Post Control - People					
Severity	Probability	Risk Score	Risk Band		
5 2 10 High					

Post Control - Environment					
Severity Probability Risk Score Risk Band					
3 2 6 Moderate					

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5 2 10 High					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
4 2 8 Moderate					

Assessment Notes

- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

ocated jetty position. mes Tideway Tunnel drawing 100-DH-CNS-

5F - LTTKS - Contact - High Speed Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
5F - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People					
Severity Probability Risk Score Risk Band					
5	5 3 15 Extreme				

Pre Control - Environment					
Severity Probability Risk Score Risk Band					
3 3 9 Moderate					

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
5	5 3 15 Extreme					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
5 3 15 Extreme					

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People			
Severity	Probability	Risk Score	Risk Band
5	2	10	High

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
5 2 10 High					

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

6F - LTTKS - Contact - Class V Passenger Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
6F- LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
5	3	15	Extreme

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	3	9	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Code of Practice Passenger Vessel Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
3	2	6	Moderate	

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
5	High				

Assessment Notes

- Jetty location is not within the authorised channel.
- Post Control score takes into consideration relocated jetty position.
- Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

7F - LTTKS - Contact - Private Leisure Vessel with Jetty

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
7F - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tunnel Jetty and associated plant & equipment.	 Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	 VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs

Pre Control - People				
Severity Probability Risk Score Risk Band				
5	3	15	Extreme	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

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				_			

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- River Thames Recreational Users Guide
- Navigational Risk Assessments in the Port of London Guidance to Operators and Owners
- Port Entry Guide

Navigational Issues and Preliminary Riask Assessment

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
5	2	10	High	

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	2	4	Minor	

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
5	2	10	High		

Post Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5 2 10 High				

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- Jetty location is not within the authorised chann
- Post Control score takes into consideration reloc
- Assessment based on jetty location as per Tham PWH11-257110 Rev AF

Proposed Additional Mitigation
 Notice to Mariners to inform river users of duration and extent of works at this site.
 Regular communication and information provided to local leisure users to keep users abreast of Thames Tideway Tunnel activities.
• Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Notes	
nel.	
ocated jetty position.	
nes Tideway Tunnel drawing 100-DH-CNS-	

8F - LTTKS - Contact - Thames Tunnel Vessel with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
8F - LTTKS	Contact - Thames Tunnel Vessel with Nine Elms Marina	A vessel conducting Tideway Tunnel construction activities makes contact with the Nine Elms Marina complex.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	• Not relevant for this phase of the project

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance					

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Assessment Notes

9F - LTTKS - Mooring breakout

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
9F - LTTKS	Mooring breakout	A vessel involved in Thames Tunnel activities breaks free temporary/layup moorings.	 Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Single Fatality / Severe permanent partial disability Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings Regional coverage 	 Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	 Use of reputable marine contractors Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People							
Severity	Probability	Risk Score	Risk Band				
4	3	12	High				

Pre Control - Environment							
Severity	Probability	Risk Score	Risk Band				
2	3	6	Moderate				

Pre Control - Operational Impact							
Severity	Probability	Risk Score	Risk Band				
4	3	12	High				

Pre Control - Media Attention						
Severity	Probability	Risk Score	Risk Band			
3 3 9 Moderate						

Relevant PLA Guidance
 Code of Practice for the Safe Mooring of Vessels on the Thames 2010

Post Control - People							
Severity	Probability	Risk Score	Risk Band				
4	2	8	Moderate				

Post Control - Environment							
Severity	Probability	Risk Score	Risk Band				
2	2	4	Minor				

Post Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
4	2	8	Moderate			

Post Control - Media Attention						
Severity	Probability	Risk Score	Risk Band			
3	2	6	Moderate			

Assessment Notes

• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

10F - LTTKS - Contact - Thames Tunnel Deconstruction Vessel/Equipment with Nine Elms Marina

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
10F- LTTKS	Contact - Thames Tunnel deconstruction vessel/equipment with Nine Elms Marina	A vessel/equipment involved in the deconstruction of the Jetty and associated infrastructure makes contact with the Nine Elms Marina complex	 Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	 Single Fatality / Severe permanent partial disability Short to medium term impact Major damage to vessel / equipment and detention National coverage 	 BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	 Notice to Mariners to inform river users of duration and extent of works at this site. Extend 'Impact Protection Piles' (as shown on Marina drawings) to the outer limits of the northern most pontoon. Marine contractors tasked with removing the jetty to provide method statement and conduct risk assessment activities for the removal of the jetty and associated infrastructure.

Pre Control - People							
Severity	Probability	Risk Score	Risk Band				
4	3	12	High				

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
2	3	6	Moderate	

Pre Control - Operational Impact					
Severity	Probability	Risk Score	Risk Band		
4	3	12	High		

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
5	3	15	Extreme	

Relevant PLA Guidance

- General Directions for Navigation in the Port of London
- Schedule to the General Directions for Navigation in the Port of London
- River Byelaws 1978 (as amended)
- Permanent Notice to Mariners
- Ship Towage Operations on the Thames
- Code of Practice for Craft Towage Operations on the Thames

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
4	2	8	Moderate	

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
2	2	4	Minor		

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
4	2	8	Moderate		

Post Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
5	2	10	High		

Assessment Notes

PWH11-257110 Rev AF

• Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-

11F - LTTKS – Collision with Commercial Freight Operator - Delivery Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
11F - LTTKS	Collision with Commercial Freight Operator	A vessel delivering project construction material collides with a commercial freight operator in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention					
Severity	Probability	Risk Score	Risk Band		
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Relevant PLA Guidance					

Post Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed					

Post Control - Environment						
Severity Probability Risk Score Risk Band						
Not Assessed						

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Media Attention						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment Notes

Proposed Additional Mitigation
t relevant for this phase of the oject

12F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
12F - LTTKS	Collision with High Speed Passenger Vessel	A vessel delivering project construction materials collides with a High Speed Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People						
Severity Probability Risk Score Risk Band						
Not Assessed						

Pre Control - Environment						
Severity Probability Risk Score Risk Band						
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed					

Relevant PLA Guidance					

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity	Probability	Risk Score	Risk Band		
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment Notes

Proposed Additional Mitigation
t relevant for this phase of the oject

13F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
13F - LTTKS	Collision with Class V Passenger Vessel	A vessel delivering project construction materials collides with a Class V Passenger Vessel in the vicinity of the Kirtling Street site. Includes the delivery of Jetty construction material.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact						
Severity	Probability	Risk Score	Risk Band			
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed					

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Relevant PLA Guidance				

Post Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment Notes

Proposed Additional Mitigation
t relevant for this phase of the oject

14F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
14F - LTTKS	Collision Thames Tunnel Vessel with Nine Elms Marina Vessel	A vessel delivering project construction material collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Media Attention				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Assessment Notes

Proposed Additional Mitigation
t relevant for this phase of the oject

15F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Commercial Freight Operator

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
15F - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Pre Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed	Not Assessed Not Assessed Not Assessed Not Assessed				

Relevant PLA Guidance	

Post Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Environment				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Operational Impact				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Assessment Notes

Proposed Additional Mitigation • Not relevant for this phase of the project	
-	Proposed Additional Mitigation
	-

16F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with High Speed Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
16F - LTTKS	Collision with High Speed Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a High Speed Passenger Vessel	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Relevant PLA Guidance	

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Assessment Notes

Proposed Additional Mitigation	
 Not relevant for this phase of the project 	

17F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Class V Passenger Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
17F - LTTKS	Collision with Class V Passenger Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Class V Passenger Vessel	• Not relevant for this phase of the project	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

	Pre Control -	Environment	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - Op	erational Impact	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Pre Control - N	ledia Attention	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Relevant PLA Guidance	

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

	Post Control -	Environment	
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment Notes

Proposed Additional Mitigation	
 Not relevant for this phase of the project 	

18F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Private Leisure Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
18F - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	• Not relevant for this phase of the project	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Environment				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Pre Control - Media Attention				
Severity Probability Risk Score Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Relevant PLA Guidance	

Post Control - People					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Post Control - Environment					
Severity	Risk Band				
Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Post Control - Operational Impact						
Severity Probability Risk Score Risk Band						
Not Assessed Not Assessed Not Assessed Not Assessed						

Post Control - Media Attention					
Severity Probability Risk Score Risk Band					
Not Assessed Not Assessed Not Assessed Not Assessed					

Assessment Notes

Proposed Additional Mitigation	
 Not relevant for this phase of the project 	

19F - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Nine Elms Marina Vessel

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards
19F - LTTKS	Collision of project Vessel with Nine Elms Marina Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Nine Elms Marina House Boat in the vicinity of the Kirtling Street site.	 Not relevant for this phase of the project 	 Not relevant for this phase of the project 	 Not relevant for this phase of the project

Pre Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Operational Impact			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Pre Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Relevant PLA Guidance	

Post Control - People			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Environment			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Post Control - Operational Impact				
Severity	Probability	Risk Score	Risk Band	
Not Assessed	Not Assessed	Not Assessed	Not Assessed	

Post Control - Media Attention			
Severity	Probability	Risk Score	Risk Band
Not Assessed	Not Assessed	Not Assessed	Not Assessed

Assessment Notes

Proposed Additional Mitigation	
 Not relevant for this phase of the project 	

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