



Application for Development Consent

Application Reference Number: WWO10001

Navigational Issues and Preliminary Risk Assessment

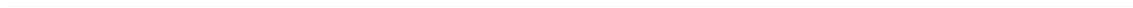
Doc Ref: **7.20.04**

Kirtling Street - Annexes: Hazard Logs

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

Hard copy available in
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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

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Annex A – Hazard log introduction

A.1 Construction Phases

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.

A.2 Risk assessment criteria

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.

Likelihood	1 - Rare	1	2	3	4	5
	2 - Unlikely	2	4	6	8	10
	3 - Possible	3	6	9	12	15
	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 required under the circumstances
15 - 25	Extreme	Intolerable risk. Job is not authorised

A.2.3 **Severity** – The criteria used throughout this assessment has been provided by the 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

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

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

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
1A	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
2A	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
3A	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

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 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
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

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

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	Proposed Additional Mitigation
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.	<ul style="list-style-type: none"> Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 not 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

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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.

2A - 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
2A - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	<p>Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.</p> <p>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.</p> <p>Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service.</p> <p>Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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.

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
<ul style="list-style-type: none"> 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 Notes
<ul style="list-style-type: none"> Post Control score takes into consideration relocated jetty position. Consultation with Cory regarding the location and size of the jetty has been conducted. AIS analysis of Cory track movements has been undertaken. Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

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	<p>The proposed jetty is situated directly in front of Cemex's jetty.</p> <p>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.</p> <p>Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames

Assessment Notes
<ul style="list-style-type: none"> 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 AIS analysis of Cory track movements has been undertaken. Analysis of Cemex current operations at this site 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	Proposed Additional Mitigation
4A - LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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
<ul style="list-style-type: none"> 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 Towing 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
<ul style="list-style-type: none"> 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

5A - 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
5A - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tunnel Jetty.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

6A - 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
6A - LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	<ul style="list-style-type: none"> VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	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
2	3	6	Moderate

Relevant PLA Guidance
<ul style="list-style-type: none"> 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
2	2	4	Minor

Assessment Notes
<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	3	6	Moderate

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice for Craft Towing 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
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Tug Operator Procedures • Emergency Plans & Procedures • Mooring Inspections • Inspection Routine • Qualified Crew 	<ul style="list-style-type: none"> • 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	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
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Proximity of Thames Tunnel jetty to Nine Elms Marina • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • 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

Post 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

Post 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

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

Relevant PLA Guidance

Assessment Notes
Not relevant for this phase of the project

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.	<ul style="list-style-type: none"> • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance • Vessels operating in close proximity 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • BML Local Knowledge Endorsement • Qualified Crew • Vessel Master Experience • Thames AIS • VHF Communications • Tug Operator Procedures • Ship Towing Code of Practice • Aids to Navigation • Emergency Plans & Procedures • COLREGs 	<ul style="list-style-type: none"> • 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> • 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 Towing Operations on the Thames • Code of Practice for Craft Towing Operations on the Thames

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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 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.	<ul style="list-style-type: none"> • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> • 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

Sub Contractors Risk Assessment								
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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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	9	Moderate

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

Relevant PLA Guidance

Assessment Notes
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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	People	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
3B	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/layout 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	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

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

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	Proposed Additional Mitigation
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.	<ul style="list-style-type: none"> Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 not impact on existing navigational safety. 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
2	4	8	Moderate

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Notes
<ul style="list-style-type: none"> 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.

2B - 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
2B- LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	<p>Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.</p> <p>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.</p> <p>Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service.</p> <p>Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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.

Pre Control - 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 - Operational 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
<ul style="list-style-type: none"> 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 Notes
<ul style="list-style-type: none"> Post Control score takes into consideration relocated jetty position. Consultation with Cory regarding the location and size of the jetty has been conducted. AIS analysis of Cory track movements has been undertaken. Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

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	<p>The proposed jetty is situated directly in front of Cemex's jetty.</p> <p>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.</p> <p>Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	Probability	Risk Score	Risk Band
3	4	12	High

Pre Control - Media Attention

Severity	Probability	Risk Score	Risk Band
2	4	8	Moderate

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

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 Towing Operations on the Thames

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
- AIS analysis of Cory track movements has been undertaken.
- Analysis of Cemex current operations at this site 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
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
<ul style="list-style-type: none"> 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 Towing 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
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	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
<ul style="list-style-type: none"> 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 Notes
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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 Notes
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

9B - LTTKS - Mooring breakout

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
9B - LTTKS	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free from temporary/layup moorings.	<ul style="list-style-type: none"> • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • Lost Time Injury / Moderate permanent partial disability injury • Low impact with no lasting effect • Moderate damage to vessel / equipment requiring immediate repairs • Local coverage 	<ul style="list-style-type: none"> • Tug Operator Procedures • Emergency Plans & Procedures • Mooring Inspections • Inspection Routine • Qualified Crew 	<ul style="list-style-type: none"> • Use of reputable marine contractors

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
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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.	<ul style="list-style-type: none"> • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance • Vessels operating in close proximity 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • BML Local Knowledge Endorsement • Qualified Crew • Vessel Master Experience • Thames AIS • VHF Communications • Tug Operator Procedures • Ship Towing Code of Practice • Aids to Navigation • Emergency Plans & Procedures • COLREGs 	<ul style="list-style-type: none"> • 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> • 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 Towing Operations on the Thames • Code of Practice for Craft Towing Operations on the Thames

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare 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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare Amenities							

14B - 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
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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

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

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

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

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

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice Passenger Vessel Operations on the Thames Code of Practice for Craft Towing Operations on the Thames

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare Amenities							

15B - 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
15B - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice Passenger Vessel Operations on the Thames Code of Practice for Craft Towing Operations on the Thames

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare Amenities							

16B - 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
16B - 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	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

17B - LTTKS - Collision with Class V Passenger Vessel - Excavated Material

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	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice for Craft Towing Operations on the Thames Navigational Risk Assessments in the Port of London - Guidance to Operators and Owners

Assessment Notes								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare Amenities							

18B - 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
18B - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
2	3	6	Moderate

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice for Craft Towing 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
2	2	4	Minor

Assessment Notes								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

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	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	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

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

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	Proposed Additional Mitigation
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.	<ul style="list-style-type: none"> Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.

2C - 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
2C - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	<p>Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.</p> <p>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.</p> <p>Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service.</p> <p>Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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 Notes
<ul style="list-style-type: none"> Post Control score takes into consideration relocated jetty position. Consultation with Cory regarding the location and size of the jetty has been conducted. AIS analysis of Cory track movements has been undertaken. Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

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	<p>The proposed jetty is situated directly in front of Cemex's jetty.</p> <p>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.</p> <p>Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames

Assessment Notes
<ul style="list-style-type: none"> 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 AIS analysis of Cory track movements has been undertaken. Analysis of Cemex current operations at this site 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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 Towing 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
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Local coverage 	<ul style="list-style-type: none"> VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Lost Time Injury / Moderate permanent partial disability injury Low impact with no lasting effect Moderate damage to vessel / equipment requiring immediate repairs Regional Coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towage Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	3	6	Moderate

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

11C - 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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
15C - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

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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

Assessment Notes

Not relevant for this phase of the project
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19C - LTTKS - Collision - Thames Tunnel Vessel/Equipment with Nine Elms Marina Vessel

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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	People	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/A
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. Includes the delivery of Jetty construction material.	10	6	10	8
12D	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
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	10
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.	8	6	10	10
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/A
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/A	N/A
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/A
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/A
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/A

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

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	Proposed Additional Mitigation
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.	<ul style="list-style-type: none"> Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 not 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

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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.

2D - 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
2D - LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	<p>Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.</p> <p>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.</p> <p>Any delays to Cory's operations are likely to have a negative impact on their ability to operate this service.</p> <p>Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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.

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

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	Extreme

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> Post Control score takes into consideration relocated jetty position. Consultation with Cory regarding the location and size of the jetty has been conducted. AIS analysis of Cory track movements has been undertaken. Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

3D - 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
3D - LTTKS	Interaction with barges using the Cemex jetty	<p>The proposed jetty is situated directly in front of Cemex's jetty.</p> <p>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.</p> <p>Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible Criminal proceedings National coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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 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
<ul style="list-style-type: none"> 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 Towing 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	Extreme

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

Assessment Notes
<ul style="list-style-type: none"> 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 AIS analysis of Cory track movements has been undertaken. Analysis of Cemex current operations at this site has been conducted.

4D - 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
4D - LTTKS	Contact - Commercial Freight Operator with Jetty	A commercial freight operator makes contact with the projects jetty at this site.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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

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

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

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

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

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

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames

Assessment Notes
<ul style="list-style-type: none"> 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

5D - 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
5D - LTTKS	Contact - High Speed Passenger Vessel with Jetty	A High Speed Passenger Vessel makes contact with the Thames Tunnel Jetty.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

6D - 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
6D - LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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	9	Moderate

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice for Craft Towing 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
<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> • Proximity of Thames Tunnel jetty to Nine Elms Marina • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Vessels operating in close proximity 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
4	3	12	High

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
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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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Single Fatality / Severe permanent partial disability Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
15D- LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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
Not relevant for this phase of the project

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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

Relevant PLA Guidance

Assessment Notes
Not relevant for this phase of the project

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/layout 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

F.2 Worst credible hazard list – Phase B: Jetty operational

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	Proposed Additional Mitigation
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.	<ul style="list-style-type: none"> Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 not impact on existing navigational safety. 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
4	3	12	High

Relevant PLA Guidance
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.

2E - 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
2E- LTTKS	Interaction with Cory Environmental Ltd operations at Cringle Dock	<p>Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.</p> <p>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.</p> <p>Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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.

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames

Assessment Notes
<ul style="list-style-type: none"> Post Control score takes into consideration relocated jetty position. Consultation with Cory regarding the location and size of the jetty has been conducted. AIS analysis of Cory track movements has been undertaken. Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

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	<p>The proposed jetty is situated directly in front of Cemex's jetty.</p> <p>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.</p> <p>Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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 AIS analysis of Cory track movements has been undertaken. Analysis of Cemex current operations at this site 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
4	3	12	High

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

9E - LTTKS - Mooring breakout

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
9E - LTTKS	Mooring breakout	A vessel involved in Thames Tideway Tunnel activities breaks free from temporary/layup moorings.	<ul style="list-style-type: none"> • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Tug Operator Procedures • Emergency Plans & Procedures • Mooring Inspections • Inspection Routine • Qualified Crew 	<ul style="list-style-type: none"> • Use of reputable marine contractors

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
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Vessels operating in close proximity 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare Amenities							

12E - 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
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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
5	3	15	Extreme

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice Passenger Vessel Operations on the Thames Code of Practice for Craft Towing Operations on the Thames

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare Amenities							

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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
5	3	15	Extreme

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare 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 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	<ul style="list-style-type: none"> Single Fatality / Severe permanent partial disability Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare 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	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Nine Elms Marina Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River incident 	<ul style="list-style-type: none"> Multiple fatalities Medium to long term effect / large area affected Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

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

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

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

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

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice Passenger Vessel Operations on the Thames Code of Practice for Craft Towing Operations on the Thames

Sub Contractors Risk Assessment								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
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
16E - 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	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

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

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

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

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

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

17E - LTTKS - Collision with Class V Passenger Vessel - Excavated Material

Hazard ID	Hazard Title	Hazard Description	Likely Hazard Causes	Consequence(s) Most Likely	Existing Safeguards	Proposed Additional Mitigation
17E - 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	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

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

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

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

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

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice for Craft Towing Operations on the Thames Navigational Risk Assessments in the Port of London - Guidance to Operators and Owners

Assessment Notes								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	Welfare 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	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	<ul style="list-style-type: none"> Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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

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

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

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

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

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

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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames Code of Practice for Craft Towing Operations on the Thames Navigational Risk Assessments in the Port of London - Guidance to Operators and Owners

Assessment Notes								
<p>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:</p> <table border="0"> <tr> <td>Working at height</td> <td>Loading / Unloading operations</td> </tr> <tr> <td>Lifting operations</td> <td>Movement of materials</td> </tr> <tr> <td>Slips and trips</td> <td>Mooring</td> </tr> <tr> <td>Fire safety</td> <td>Welfare Amenities</td> </tr> </table>	Working at height	Loading / Unloading operations	Lifting operations	Movement of materials	Slips and trips	Mooring	Fire safety	Welfare Amenities
Working at height	Loading / Unloading operations							
Lifting operations	Movement of materials							
Slips and trips	Mooring							
Fire safety	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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance River Incident 	<ul style="list-style-type: none"> Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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	2	10	High

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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

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 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
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 deconstruction 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

12F	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
13F	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
14F	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
15F	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

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

G.2 Worst credible hazard list – Phase C: Removal of jetty

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	Proposed Additional Mitigation
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.	<ul style="list-style-type: none"> Reduced effective river width Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance Tidal set River Incident 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
4	3	12	High

Relevant PLA Guidance
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.

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	<p>Cory Environmental Ltd operates a daily tug and barge operation to their Cringle Dock waste transfer facility.</p> <p>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.</p> <p>Due to the proximity of the proposed jetty to Cory operations, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of jetty to Cory operations Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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	Extreme

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> Post Control score takes into consideration relocated jetty position. Consultation with Cory regarding the location and size of the jetty has been conducted. AIS analysis of Cory track movements has been undertaken. Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 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	<p>The proposed jetty is situated directly in front of Cemex's jetty.</p> <p>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.</p> <p>Due to the proximity of the Thames Tideway Tunnel jetty to the Cemex jetty, a river incident occurs.</p>	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to Cemex jetty Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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	Extreme

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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

Assessment Notes
<ul style="list-style-type: none"> 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 AIS analysis of Cory track movements has been undertaken. Analysis of Cemex current operations at this site 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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings National coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Tug Operator Procedures Ship Towing Code of Practice Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
4	3	12	High

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

Relevant PLA Guidance
<ul style="list-style-type: none"> 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 Towing Operations on the Thames

Assessment Notes
<ul style="list-style-type: none"> 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

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.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Short to medium term impact Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> BML Local Knowledge Endorsement Qualified Crew Vessel Master Experience Thames AIS VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
6F- LTTKS	Contact - Class V Passenger Vessel with Jetty	A Class V Passenger Vessel makes contact with the Thames Tunnel Jetty.	<ul style="list-style-type: none"> • Proximity of Thames Tunnel jetty to authorised channel • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • Multiple fatalities • Short to medium term impact • Very serious damage to vessel or equipment possible • Criminal proceedings • International coverage 	<ul style="list-style-type: none"> • BML Local Knowledge Endorsement • Qualified Crew • Vessel Master Experience • Thames AIS • VHF Communications • Aids to Navigation • Emergency Plans & Procedures • COLREGs 	<ul style="list-style-type: none"> • 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> • 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

Assessment Notes
<ul style="list-style-type: none"> • 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	Proposed Additional Mitigation
7F - LTTKS	Contact - Private Leisure Vessel with Jetty	A Private Leisure Vessel makes contact with the Thames Tunnel Jetty and associated plant & equipment.	<ul style="list-style-type: none"> Proximity of Thames Tunnel jetty to authorised channel Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> Multiple fatalities Temporary effect / Minor effect to small area Very serious damage to vessel or equipment possible criminal proceedings International coverage 	<ul style="list-style-type: none"> VHF Communications Aids to Navigation Emergency Plans & Procedures COLREGs 	<ul style="list-style-type: none"> 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
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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

Relevant PLA Guidance

Assessment Notes
Not relevant for this phase of the project

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.	<ul style="list-style-type: none"> Misjudgement Inattention Adverse weather conditions Machinery breakdown Collision avoidance 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Tug Operator Procedures Emergency Plans & Procedures Mooring Inspections Inspection Routine Qualified Crew 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> • Proximity of Thames Tunnel jetty to Nine Elms Marina • Misjudgement • Inattention • Adverse weather conditions • Machinery breakdown • Collision avoidance 	<ul style="list-style-type: none"> • Single Fatality / Severe permanent partial disability • Short to medium term impact • Major damage to vessel / equipment and detention • National coverage 	<ul style="list-style-type: none"> • BML Local Knowledge Endorsement • Qualified Crew • Vessel Master Experience • Tug Operator Procedures • Ship Towing Code of Practice • Aids to Navigation • Emergency Plans & Procedures • COLREGs 	<ul style="list-style-type: none"> • 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

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

Relevant PLA Guidance
<ul style="list-style-type: none"> • 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 Towing Operations on the Thames • Code of Practice for Craft Towing Operations on the Thames

Assessment Notes
<ul style="list-style-type: none"> • Assessment based on jetty location as per Thames Tideway Tunnel drawing 100-DH-CNS-PWH11-257110 Rev AF

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • Not relevant for this phase of the project 	<ul style="list-style-type: none"> • 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
15F - LTTKS	Collision with Commercial Freight Operator	A vessel taking excavated material away from the Kirtling Street site collides with a Commercial Freight Operator.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
18F - LTTKS	Collision with Private Leisure Vessel	A vessel taking excavated material away from the Kirtling Street site collides with a Private Leisure Vessel	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

Post 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

Post 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

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

<i>Relevant PLA Guidance</i>

<i>Assessment Notes</i>
Not relevant for this phase of the project

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

<i>Hazard ID</i>	<i>Hazard Title</i>	<i>Hazard Description</i>	<i>Likely Hazard Causes</i>	<i>Consequence(s) Most Likely</i>	<i>Existing Safeguards</i>	<i>Proposed Additional Mitigation</i>
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.	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> Not relevant for this phase of the project 	<ul style="list-style-type: none"> 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

<i>Relevant PLA Guidance</i>

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

<i>Assessment Notes</i>
Not relevant for this phase of the project

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