

London Gateway Port: Channel Clearance and Dredging
Archaeological Methods and Procedures

DRAFT 31/10/07

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1. INTRODUCTION

- 1.1. This document sets out the archaeological methods and procedures that are to accompany channel clearance and dredging for London Gateway Port.
- 1.2. The Port of London Authority (PLA) is to carry out clearance of wrecks in advance of dredging. The dredging is to be carried out by DP World (DPW) in the course of developing London Gateway Port. Both clearance and dredging may have implications for archaeology. Proposals for archaeological investigations are being submitted to the English Heritage Maritime Team (EHMT) for their agreement.
- 1.3. In anticipation of clearance and dredging, PLA has contracted Wessex Archaeology (WA) to provide a series of archaeological services. Further archaeological services accompanying clearance and dredging are being commissioned task-by-task.
- 1.4. Three major phases of work are anticipated:
 - Pre-clearance works, comprising geophysical survey and diving inspections by the PLA, and archaeological investigations by WA.
 - Clearance Operations by the PLA and by salvage contractors, accompanied where necessary by archaeological investigations.
 - Dredging by a dredging contractor, accompanied by a protocol for archaeological discoveries in the course of dredging, and by monitoring of archaeological exclusion zones.
- 1.5. The aim of the archaeological investigations described here is to avoid, reduce and remedy any adverse effects on the maritime historic environment that are attributable to clearance and dredging for London Gateway Port.

2. BACKGROUND

- 2.1. The PLA's powers and responsibilities with respect to clearance and other port-related activities are set out in the Port of London Act 1968 (PoLA 1968). Some of the clearance extends beyond the statutory boundary of the Port of London Act, where the relevant provisions of the Merchant Shipping Act 1995 will apply. The PLA's actions in respect of archaeology are co-ordinated by the PLA River Regime and Environmental Manager (PLA RREM).
- 2.2. London Gateway Port is being developed under a variety of consents, including a Harbour Empowerment Order. The application for consents was accompanied by Environmental Statements, which assessed effects on the historic environment and set out a framework for their mitigation, namely the Archaeological Mitigation Framework (AMF – Appendix T, March 2003). The AMF made provision for the appointment of an Archaeological Liaison Officer (ALO) who is responsible for providing archaeological advice to DPW. The archaeological methods and procedures that accompany clearance and dredging will accord with the AMF.
- 2.3. In addition to curatorial advice sought from EHMT, advice relating to procedures relating to 'wreck' under the Merchant Shipping Act 1995 (MSA 1995), and about the ownership of named wrecks, has been sought from the Receiver of Wreck (RoW). Authorities with continuing interests in some of the named wrecks include Trinity House (TH), Department for Transport (DfT) and the Ministry of Defence (MOD).
- 2.4. None of the wrecks within the clearance and dredging are subject to additional statutory protection under the Protection of Wrecks Act 1973 or the Protection of Military Remains Act 1986.

3. DEVELOPMENT OF MITIGATION STRATEGY

3.1. OUTLINE

3.1.1. The archaeological approach to channel clearance and dredging for London Gateway Port is based upon:

- Studies undertaken in support of the ES that accompanied the London Gateway HEO application.
- Mitigation proposals developed in 2005.
- Clearance Mitigation Statements for individual wrecks and anomalies, initiated in 2006, as informed by geophysical, diving and desk-based investigations.

3.2. MITIGATION STAGES

3.2.1. A general staged approach to mitigation was developed in the course of the EIA, whereby archaeological mitigation overlapped with other forms of investigation or activity. The forms of mitigation that were anticipated were as follows:

| | | |
|----------------------|---|---|
| Pre-Clearance | A | Documentary investigation to establish relative importance. |
| | B | Archaeological inspection by diver and/or remote operated vehicle (ROV) to prove/disprove their character by direct observation. |
| | C | Site-specific multibeam bathymetric survey to quantify site topography. |
| | D | Site-specific geophysical survey comprising sub-bottom and magnetometer survey to establish extents of buried/ferrous material. |
| | E | Intrusive investigation to gauge the complexity of stratigraphy, survival of artefacts, conservation needs and coherence of structural remains. |
| Clearance | F | Avoidance , to include monitoring. |
| | G | Clearance without further archaeological recording. |
| | H | Clearance with limited archaeological observation and recording in the course of dispersal/recovery operations. |
| | I | Archaeological recording (to include limited excavation) prior to controlled dispersal/clearance, recovery being limited to finds rather than structure. |
| | J | Archaeological recovery , i.e. recording (to include excavation) and recovery of all or part of the wreck structure and its contents. |
| Dredging | K | Archaeological Protocol , to alert archaeologists to discoveries made during dredging and provide for their assessment/evaluation and management. |
| | L | Periodic inspection of the base and sections of dredged areas, to include assessing/evaluating and managing sites that are uncovered. |
| | M | Periodic survey of areas (e.g. channel sides) where sediment movement occurs following dredging or following increases in size and volume of traffic, to include assessing/evaluating and managing sites that are uncovered. |

Table 1: Forms of Mitigation

3.2.2. Some of the forms of mitigation set out above have already been implemented.

3.3. SITE GROUPS

3.3.1. As part of the mitigation proposals developed in 2005, wreck sites and features were ascribed to one of the following groups:

| | |
|-----------|--|
| Certain | Used for the small number of sites that are clearly of archaeological interest, with remains present on the seabed that are likely to be considered of high importance. |
| Probable | Used for sites where there are certainly remains present that are likely to be considered at least moderately important, plus sites where the presence of remains is less certain, but if present the remains will be considered moderately-highly important. |
| Possible | Generally used for sites where there are certainly remains present, where those remains may be of low to moderate importance, or important to a specific sector. This category largely comprises known wrecks lost in WWI and WWII, plus debris relating to the submarine boom. The level of importance will depend on the details of the site. |
| Uncertain | Used for anomalies and fouls, that is to say sites where there appears to be anomalous features on the seabed, but where the character of the anomalies is difficult to ascribe with certainty to any of the other categories, archaeological or non-archaeological. The 'uncertain' therefore include sites which may prove to be of archaeological origin/interest, but which may not. |

3.3.2. A number of other wrecks and features were filtered out because no mitigation was required. Typically, these sites lay outside the horizontal footprint of proposed channel dredging, were below the proposed dredge depth, or had been shown to be clear.

3.3.3. Where a wreck site or feature was classed as 'Certain', 'Probable', 'Possible', or 'Uncertain - ?archaeological feature', proposed mitigation was set out that referred to the forms of mitigation in Table 1. Reference was also made to the level of record that the stage of mitigation was intended to achieve, using the system of Recording Levels developed by WA (see Annex I of this document).

3.4. CLEARANCE MITIGATION STATEMENTS

3.4.1. For the sites identified as 'Certain', 'Probable' and 'Possible', site-specific Clearance Mitigation Statements (CMS) were developed. The CMS were intended to cover the point up to which dredging starts, i.e. the dredging contractor could be handed a series of CMS setting out the situation in respect of each site at the end of clearance activities, describing the current form of the site (e.g 'cleared to -15mCD'; 'extensive remains present to north of dredging area') and outlining any work still required (e.g. monitoring; reporting) in the course of construction.

3.4.2. One or two iterations of the CMS was anticipated, setting out the investigations that are required during pre-clearance and clearance, and informed by the investigations that have taken place up to that point. As such, the phasing of the CMS was expected to be as follows:

| | |
|---------------------|---|
| First Draft | Informed by historical and existing data, to include high-res multibeam. To set out scope of any further investigations during pre-clearance or clearance. In some instances, this first draft might conclude that no further pre-clearance or clearance mitigation is required (e.g. where site is to be avoided). |
| Second Draft | Informed by archaeological diving inspection (if required) or other pre-clearance investigations (e.g. documentary research). To set out scope of clearance mitigation (dispersal, recovery, recording etc.). As above, the second draft may conclude that no mitigation is required during clearance. |
| Third (final) Draft | Informed by completed investigations during clearance. To set out scope of actions during dredging. |

3.4.3. First draft CMS were submitted to and agreed by EHMT in April 2006.

3.5. PREPARATIONS 2006-07

- 3.5.1. Proposals to carry out a first tranche of pre-clearance diving (i.e. archaeological inspection (Mit B)) were agreed for May-June 2006. It was anticipated that a further tranche of diving (i.e. intrusive investigation (Mit E)) would commence immediately thereafter, where a need was identified from the first tranche. In the event, this programme was postponed.
- 3.5.2. Subsequent discussion has addressed diving proposals in the light of revisions to the channel alignment and the historical sensitivities of certain sites.
- 3.5.3. Further data has been acquired since the CMS were drafted, through inspections by PLA divers, through a combined PLA/WA diving operation in 2006, and through geophysical survey.
- 3.5.4. The strategy for addressing the sites classed as 'Uncertain - ?archaeological feature' has remained under discussion and is still being developed.
- 3.5.5. New geophysical data from the channel is being reviewed for possible features by the PLA. Results are being incorporated into the archaeological mitigation programme where appropriate.

4. OVERVIEW OF ARCHAEOLOGICAL PROCEDURES

4.1. COMMAND AND COMMUNICATION

- 4.1.1. Mitigation (including any archaeological investigations) during pre-clearance and clearance will be proposed by PLA in discussion with DPW's ALO.
- 4.1.2. Mitigation proposals will be provided to EHMT for agreement. Proposals will make provision for the management of any recovered material. Where the investigation has implications for 'wreck' subject to the MSA 1995, the proposal will also be provided to the RoW for agreement.
- 4.1.3. Archaeological investigations will be implemented by WA on instruction from PLA and in accordance with the Codes, Standards and Guidance of the Institute of Field Archaeologists.
- 4.1.4. This document will be revised periodically by the PLA in discussion with the ALO, with the agreement of EH and RoW.

4.2. DOCUMENTATION

- 4.2.1. In the course of pre-clearance and clearance, the CMS – as revised – will provide the principal form of archaeological documentation.
- 4.2.2. In order to facilitate the rapid communication that is required for operational reasons in the course of pre-clearance diving, the CMS will be supplemented by short reports on the results and recommendations of specific investigations. The reports will be illustrated with photographs, GIS views, screenshots and similar graphics where appropriate. The short reports will be suitable for submission to the PLA and circulation to EHMT and RoW.
- 4.2.3. The content of short reports will be incorporated into subsequent revisions of the relevant CMS.
- 4.2.4. Once archaeological investigations – including any investigations or results arising during dredging – are complete, the CMS will be finalised to include all details of the investigations and their results. The final documents will form part of the project archive.

4.3. ARCHAEOLOGICAL EXCLUSION ZONES

- 4.3.1. Archaeological Exclusion Zones (AEZs) will be implemented and monitored during clearance and dredging with respect to specific sites. Details of the documentation of AEZ monitoring are set out in the relevant Method Statement (see Appendices). The results of monitoring will be appended to the relevant CMS and included in the Archaeological Report.

4.4. ARCHAEOLOGICAL PROTOCOL FOR DREDGING

- 4.4.1. Details of the structure and content of the proposed Archaeological Protocol for Dredging (APD) are set out in the relevant Method Statement (see Appendices). In the event that a site is discovered that warrants archaeological investigation and/or clearance, a CMS will be prepared and revised as necessary.

4.5. POST-EXCAVATION

- 4.5.1. The AMF anticipates an integrated approach to post-excavation assessment, analysis and dissemination encompassing the results of all separate areas / phases of work, both 'wetside' and 'dryside'. Post-excavation methodologies for archaeological investigations from all phases of channel clearance and dredging will accord with the AMF. Integration with the post-excavation programme of 'dryside' archaeological investigations will be co-ordinated by the ALO.
- 4.5.2. In accordance with the AMF, the results of archaeological investigations from all phases of channel clearance and dredging will be subject to post-excavation assessment to establish what further work, if any, is required as part of the post-excavation programme. Post-excavation assessment will draw on the project archive and will address the potential for further analysis and publication, wider dissemination, and detailed arrangements for deposition of the paper, digital and material archive.
- 4.5.3. Where finds (including structure) and samples have been recovered, post-excavation assessment will be initiated within one year of recovery, in order that it can inform decisions by the Receiver of Wreck. The assessment of finds will address the disposal/discard of finds and any further cleaning, stabilisation or other conservation measures required prior to deposition,
- 4.5.4. In view of the overall timetable for pre-clearance, clearance and dredging, post-excavation may be conducted site-by-site and phased where necessary.
- 4.5.5. Post-excavation assessment will include recommendations for the post-excavation programme, and will be submitted to EHMT for agreement.
- 4.5.6. The post-excavation programme will be carried out in accordance with the recommendations of the post-excavation assessment. The post-excavation programme will include:
- Analysis.
 - Conservation.
 - Public Dissemination.
 - Deposition of a publicly accessible paper, digital and material archive, by agreement with a suitable repository.

5. SITES NOT SUBJECT TO FURTHER ARCHAEOLOGICAL MITIGATION

5.1. SITES SUBJECT TO AVOIDANCE

- 5.1.1. The following sites that were subject to CMS in 2006 are to be avoided by changes to navigation, including the positioning of buoys. No further archaeological mitigation is proposed.

| | | |
|------|------------|--|
| 5005 | Letchworth | Additional site-specific sidescan data has been acquired to augment the CMS. |
| 5008 | Argus | Additional site-specific sidescan data has been acquired to augment the CMS. |

5.2. SITES NOT SUBJECT TO FURTHER FIELDWORK

- 5.2.1. Several sites that were subject to CMS in 2006 will not be subject to further mitigation, for the reasons set out below:

| | | |
|------|-----------------|---|
| 5070 | Ryal | No longer within footprint |
| 6595 | Halcrow A5 | No material present; now considered to have been highlighted by Halcrow as a result of a positioning typo. |
| 5041 | Aircraft | No material present |
| 5195 | Submarine Boom | Material within footprint recovered; material outside channel to remain in situ. Documentary research being carried out to enhance existing record. |
| 7543 | German aircraft | Engine recovered and accessioned by Duxford; no further material present. |

- 5.2.2. The following sites subject to CMS in 2006 will be cleared without further mitigation, for the reasons set out below:

| | | |
|------|----------|--|
| 5011 | Atherton | Merchant ship lost 1921. No loss of life. Additional site-specific sidescan data has been acquired to augment the CMS. |
| 5013 | Ash | Admiralty trawler lost 1941. No loss of life. Additional site-specific sidescan data has been acquired to augment the CMS. |
| 5063 | Amethyst | Requisitioned trawler lost 1940. No loss of life. Additional site-specific sidescan data has been acquired to augment the CMS. |
| 5010 | Dovenby | Sailing merchant ship lost 1914. |

6. PRE-CLEARANCE

6.1. ARCHAEOLOGICAL INSPECTION (MIT B)

- 6.1.1. Archaeological inspection by diver is intended to achieve a level of recording that exceeds Level 1b and covers some aspects of Level 2a, within approximately 90-120 minutes of bottom time.
- 6.1.2. In seeking to achieve a Level 1b/2a record, Archaeological Inspection will generally be non-intrusive, limited to light cleaning, probing and basic recording. Bulk removal of plant/animal growth, sediment, or debris will not be attempted.
- 6.1.3. The recovery of finds and samples will be limited to 'spot sampling' to address the objectives above. It is possible, however, that extensive recoveries of small finds may be required to achieve a sample sufficient to establish likely character, date and importance.
- 6.1.4. The sites identified for Archaeological Inspection in the first tranche of diving (from 05/11/07) fall into three principal groups. The first group is as follows:
- | | |
|------|----------------------|
| 5056 | East Oaze Light Ship |
| 5100 | Dynamo |
| 5960 | Storm |
| 5961 | Erna Boldt |
- 6.1.5. As can be seen, the first group are sites that are mostly known by name, lost in the C20th as a result of military action during WWI and WWII. Lives were lost on these wrecks, and not all of the casualties were recovered. At present, two of these wrecks – 5056 and 5100 – are earmarked to be 'resettled' below the dredging depth, rather than being cleared, because of sensitivities in relation to the casualties.
- 6.1.6. Although the primary concern in respect of these wrecks is the loss of life, there is also historical and archaeological interest arising from the East Oaze Light Ship.
- 6.1.7. As the presence, position, type, extent and date of these sites has already been established by geophysical and desk-based investigations, the objectives of the first tranche of diving are principally concerned with confirming their character and importance. The specific objectives are as follows:
- To establish the potential presence of human remains and/or personal effects;
 - To establish the potential presence of munitions;
 - To observe the extent of survival and condition of any features of historical or archaeological interest;
 - To observe the overall structural integrity of the wrecks earmarked for resettling;
 - To establish the scope of further archaeological mitigation, if any.

6.1.8. The second group of sites subject to Archaeological Inspection in the first tranche of diving is as follows:

| | |
|------|--------------------------|
| 5046 | Wreck NW of SR1 |
| 5050 | Mound |
| 5051 | Old Timbers and Concrete |
| 5124 | Unknown Wreck |
| 5185 | Ancient Wreck |
| 5230 | Brick Barge |
| 7345 | Carvel Planking |
| 7404 | 60m Feature |
| 7563 | Complex Anomaly |

6.1.9. None of these sites have been named as yet. Some are certainly wreck sites, whereas some may prove not to be wrecks. The Brick Barge seems likely to be a C19th or C20th loss. All the sites seem likely to be wooden-hulled (if, indeed, they prove to be wrecks) and are consequently less coherent, with structural elements and artefacts likely to be dispersed beyond site boundaries observable in geophysical data. In each case, however, the site position is known. The objectives for this group of sites are as follows:

- To establish the presence and type of site (where this is not yet known);
- To establish the extent, character, date and importance of the site, insofar as is possible within the available time;
- To observe the extent of survival and condition of any features of historical or archaeological interest;
- To establish the scope of further archaeological mitigation, if any.

6.1.10. The third group comprises only one site, the 'Dovenby North' (5012). The presence, position and extent of the site have already been established by geophysical and diving investigations. The 'Dovenby North' may prove to be part of the Dovenby (South) wreck. The objective for this site is:

- To establish whether 5012 is part of the Dovenby.

6.1.11. If 5012 is not a part of the Dovenby, objectives appropriate to its apparent character will apply.

6.2. INTRUSIVE INVESTIGATION (MIT E)

6.2.1. In the event that Archaeological Inspection in the first tranche of diving (from 05/11/07) establishes that a site is of special historical or archaeological interest, then Intrusive Investigation may be required. The intention of Intrusive Investigation is to gauge the complexity of stratigraphy, survival of artefacts, conservation needs and coherence of structural remains. Such diving will seek to achieve recording to Level 2b (intrusive), to include vigorous cleaning, test-pits and/or trenches. Level 2b recording may include recovery (following recording) of structural elements disturbed by investigation.

6.2.2. Provision has been made for Intrusive Evaluation to follow soon after Archaeological Inspection, by a second tranche of diving following directly after the first tranche of diving (from c. 26/11/07).

7. CLEARANCE

7.1. AVOIDANCE: ARCHAEOLOGICAL EXCLUSION ZONES (MIT F)

7.1.1. The following sites are being avoided by changes to the design of the channel on account of their archaeological sensitivity. Mitigation will be achieved by establishing and monitoring Archaeological Exclusion Zones:

5019 'King'

5029 London Additional site-specific sidescan data has been acquired to augment the CMS.

5020 Iron Bar Wreck

7.1.2. The Method Statement for establishing and monitoring Archaeological Exclusion Zones is set out in the relevant Method Statement (see Appendices).

7.2. AVOIDANCE: NAVIGATION MANAGEMENT

7.2.1. As noted in Section 5.1, the Letchworth and the Argus are to be avoided by changes to navigation management, specifically by placing channel marker buoys adjacent to them. No further archaeological recording is to take place.

7.3. CLEARANCE WITHOUT FURTHER ARCHAEOLOGICAL RECORDING (MIT G)

7.3.1. As noted in Section 5.2, the following wrecks are to be cleared without further archaeological recording:

5011 Atherton

5013 Ash

5063 Amethyst

5010 Dovenby

7.3.2. Subject to the results, a number of the sites that are to be subject by Archaeological Inspection in the first tranche of diving are likely to be cleared without further archaeological recording.

7.3.3. It is anticipated that a specialist contractor will be employed by the PLA to carry out clearance of sites that are large and/or retain some degree of structural coherence. The PLA is in the process of putting out a tender to potential contractors. The methodology for clearance will form part of each bidders' proposal.

7.3.4. The objectives of clearance will be non-archaeological.

7.3.5. Where practicable, the PLA will make provision for selected artefacts recovered in the course of clearance to be handed to the PLA by the clearance contractor and retained.

7.3.6. The PLA will carry out clearance of small and/or disarticulated sites using its own resources. Where practicable, selected artefacts recovered in the course of clearance will be retained.

7.4. RESETTLEMENT

7.4.1. As noted in paragraph 6.1.5., the Dynamo and the East Oaze Light Ship may be 'resettled'. The methodology to be adopted in resettling these vessels is still under

development. The scope for archaeological observation, monitoring and/or recording in the course of resettlement has yet to be established, though it is expected that all material will remain on the seabed (i.e. no finds are to be recovered).

7.5. CONTROLLED CLEARANCE (MIT H)

In-Water Archaeological Observation and Recording

- 7.5.1. Provision has been made to carry out in-water archaeological observation and recording in the course of clearance carried out by the PLA.
- 7.5.2. In-water archaeological observation and recording will be achieved by embedding diving archaeologists equipped with acoustic positioning within the PLA diving team.
- 7.5.3. The overall objectives of clearance will be non-archaeological and operations will be directed by the PLA. Clearance will be accompanied by such archaeological observations and recording as are practicable within the PLA's operation.
- 7.5.4. Insofar as is practicable, in-water archaeological observation and recording will seek to achieve a Level 3a record of the site. Generally, the archaeological objectives will be:
 - To establish the overall components, layout (form/distribution) and sequences of the site;
 - To recover and retain diagnostic structural elements, large finds and/or a representative assemblage of small finds from the site;
 - To record (describe, draw, sketch, photograph) structural elements, large finds and small finds that are not retained.
- 7.5.5. Where practicable, the position of material on the seabed will be recorded prior to recovery. Other records may be made following recovery.
- 7.5.6. At present only one site, the Pottery Wreck (5204), has been earmarked for clearance accompanied by in-water archaeological observation and recording.
- 7.5.7. Subject to the results of Archaeological Inspection in the first tranche of diving, a number of other sites may be subject to accompanied by in-water archaeological observation and recording.

Onboard Archaeological Observation and Recording

- 7.5.8. Provision may be made to implement onboard archaeological observation and recording in the course of clearance carried out by the PLA and the PLA's clearance contractor.
- 7.5.9. Onboard archaeological observation and recording will be implemented by way of a watching brief by an archaeologist during clearance. The watching brief may be continuous or intermittent.
- 7.5.10. The overall objectives of clearance will be non-archaeological and operations will be directed by the PLA and/or their clearance contractor. Archaeological observations and recording will be limited to those actions that are operationally practicable.

- 7.5.11. Insofar as is practicable, onboard archaeological observation and recording will seek to achieve a Level 3a record of the site. Generally, the archaeological objectives will be:
- To establish the overall components, layout (form/distribution) and sequences of the site;
 - To recover and retain diagnostic structural elements, large finds and/or a representative assemblage of small finds from the site;
 - To record (describe, draw, sketch, photograph) structural elements, large finds and small finds that are not retained.
- 7.5.12. The position of material on the seabed prior to recovery will not be recorded directly, though the position of clearance equipment relative to previous data (e.g. geophysics) will be noted where possible. Other records will be made following recovery.
- 7.5.13. No sites have currently been earmarked for clearance accompanied by onboard archaeological observation and recording.

7.6. ARCHAEOLOGICAL RECORDING (MIT I)

- 7.6.1. Archaeological Recording (to include limited excavation) in the course of clearance will seek to achieve recording to Level 3a (diagnostic) or 3b (unexcavated).
- 7.6.2. The overall objective of a Level 3 record is to enable an archaeologist who has not seen the site to comprehend its components, layout and sequences. A Level 3a record is expected to achieve a detailed record of selected elements of the site within 7-10 hours of bottom time. A Level 3b record is expected to achieve a detailed record of all elements of the site visible without excavation and may take up to 20 hours bottom time.
- 7.6.3. Recovery will be limited to finds rather than structure. The position of finds on the seabed will be recorded prior to recovery. Other records may be made while finds are *in situ*, or following recovery. Material that is not recovered will be recorded *in situ*.
- 7.6.4. No sites have yet been identified for Archaeological Recording.
- 7.6.5. The recommendation that any particular site is to be subject to Archaeological Recording will be accompanied by detailed objectives for the investigation.

Archaeological Recovery (Mit J)

- 7.6.6. Archaeological Recovery in the course of clearance will include excavation and the recovery of all or part of the wreck structure and its contents, with the intention of achieving a Level 3c record.
- 7.6.7. As noted in paragraph 7.6.2., the objective of a Level 3 record is to enable an archaeologist who has not seen the site to comprehend its components, layout and sequences; a Level 3c record is expected to achieve a detailed record of all elements of the site exposed by open excavation. Level 3c recording may take 50 hours of bottom time.

- 7.6.8. Recovery will include finds and structure. The position of finds and structure on the seabed will be recorded prior to recovery. Other records may be made *in situ*, or following recovery.
- 7.6.9. No sites have yet been identified for Archaeological Recovery.
- 7.6.10. The recommendation that any particular site is to be subject to Archaeological Recovery will be accompanied by detailed objectives for the investigation.

8. DREDGING**8.1. SCOPE OF DREDGING OPERATIONS**

- 8.1.1. Dredging operations will be carried out by a dredging contractor commissioned by DPW. The details (types and numbers of vessels; phasing; methodologies; environmental management) of the dredging have yet to be confirmed.
- 8.1.2. The AEZs introduced for Clearance will continue to apply, and continue to be monitored, during dredging.

8.2. ARCHAEOLOGICAL PROTOCOL FOR DREDGING (MIT K)

- 8.2.1. An Archaeological Protocol for Dredging (APD) will be implemented. The anticipated structure and content of the APD is set out in the relevant Method Statement (see Appendices).

ANNEX I: WA RECORDING LEVELS

| Level | Type | Objective | Sub-level | Character | Scope | Recording Tasks | Recording Focus |
|-------|------------|---|-----------|-----------------------|--|--|--|
| 1 | Assessment | A record sufficient to establish the presence, position and type of site. | 1a | Indirect (desk-based) | From documentary, cartographic or graphic sources, including photographic (incl. AP), geotechnical and geophysical surveys commissioned for purposes other than archaeology. | | |
| | | | 1b | Direct (field) | From geophysical, diving inspection etc., including surveys commissioned specifically for archaeological purposes. | | |
| 2 | Evaluation | A record that provides sufficient data to establish the extent, character, date and importance of the site. | 2a | Non-intrusive | To include light cleaning, probing and spot sampling, but without bulk removal of plant growth, soil, debris etc. and basic recording | Extent: -Acoustic tracking around site with ROV or diver or -Tape measurements of site extents based on geophysical data or -Sketch of extents based on video footage and geophysical data Character & Date - Written description and - Sketch record and - Photographic record or - Video record | Extent: Focus on establishing the full site extent, including possible buried sections and debris fields. Character & Date: Focus on: <u>Build:</u> - Construction (material, fastenings, methods) - Propulsion (sail, steam, diesel or a combination) - Diagnostic features (machinery, fittings, armament) <u>Use</u> - Artefacts/Cargo (dating objects) <u>Survival:</u> General survival of site <u>Investigation:</u> - Traces of any previous work on the site (salvage, excavation, etc. |
| | | | 2b | Intrusive | To include vigorous cleaning, test pits and/or trenches. May also include recovery (following recording) of elements at immediate risk, or disturbed by investigation. | | |

| | | | | | | | | | |
|---|---------------------|---|----|-------------|--|---|---|--|-----------------------------|
| 3 | In situ Recording | A record that enables an archaeologist who has not seen the site to comprehend its components, layout and sequences. | 3a | Diagnostic | A detailed record of selected elements of the site. | Detailed Record: - Written description and - Measured drawings or detailed measured sketches and - Photographs (stand-off and close-ups) and - Detailed video survey or - Photo mosaic for visualisation purposes | Selection of elements to be recorded should be based on Level 2 survey. In general decision based on: - Diagnostic quality of elements - Representative quality of elements (are elements typical for period?) - Rarity (are elements rare and unusual for period?) - Accessibility of elements - State of preservation of elements | | |
| | | | 3b | Unexcavated | A detailed record of all elements of the site visible without excavation. | | | As above but for whole site | All exposed elements |
| | | | 3c | Excavated | A detailed record of all elements of the site exposed by open excavation of part or whole of the site. | | | As above but for whole site after excavation | All elements after exposure |
| 4 | Removal | A record sufficient to enable analytical reconstruction and/or reinterpretation of the site, its components and its matrix. | | | A complete record of all elements of the site in the course of dismantling and/or excavation. | | | | |
| 5 | Inter-site Analysis | A record that places the site in the context of its cultural environment and other comparable sites. | | | A complete record and analysis of all elements of the site, including comparisons with other sites. | | | | |

London Gateway Port: Channel Clearance and Dredging
Appendices: Method Statements

DRAFT 31/10/07

APPENDIX I. ARCHAEOLOGICAL RECORDING

BASICS

1. All recording will be based on the WA unique site identifiers used in the ES and subsequently.
2. All archaeological finds and deposits will be recorded using a pro forma recording system, based on a running matrix of assigned contexts for each site. Numbers will be allocated in blocks that are unique to that site. A number log will be maintained.
3. The spot height of all principal features and levels will be calculated in metres relative to Ordnance Datum, correct to two decimal places. Plans, sections and elevations will be annotated with spot heights as appropriate. The maximum level of principal features and of the seabed will be converted to metres relative to Chart Datum.
4. Plans of each investigation will be prepared at a scale of 1:1250 or larger, showing all investigation areas and their relation to more permanent topographical features. Each plan will show the location of contexts observed and recorded in the course of the investigation.
5. Plans, sections and elevations of archaeological features and deposits will be drawn as necessary at 1:10, 1:20 and 1:50 as appropriate. Drawings will be made in pencil on permanent drafting film, or in an accessible digital format.
6. A full photographic record will be maintained using digital video and stills photography. Recovered material will be subject to photographic recording by monochrome prints and colour transparencies. Additional illustrative photographs will be taken as appropriate.
7. Surveys will be carried out to a single datum and co-ordinate system, namely UTM Zone 31N projected from WGS84.

ACOUSTIC TRACKING

8. The position of the diver will be derived using an acoustic navigation system. The position will be integrated into a diver tracking and recording system where the position of objects on the seabed can be compared to the geophysical data, and the extent, and character of features recorded.
9. An Ultra Short Baseline (USBL) acoustic tracking system SCOUT manufactured by Sonardyne International will be used for acoustic tracking.
10. The SCOUT system consists of three main components: the vessel mounted acoustic transceiver, the diver mounted transponder, and the surface command module running the control software.
11. The position of the diver is calculated by measuring range and bearing from the vessel mounted transceiver to the transponder mounted on the diver's umbilical, using the signal properties of the acoustic energy emitted from the transceiver.
12. The range is calculated from the signal travel time and the bearing is calculated from the phase difference of the return signal across the transducer array within the surface transceiver.

13. The transponder work on frequencies between 35kHz and 55kHz. The stated operating range for the system is 500m and the acoustic coverage is +/- 90 degrees below the transceiver.
14. The SCOUT USBL Transceiver will be mounted on a pole over the side of the diving support vessel.
15. The following peripheral sensors will be integrated with the SCOUT USBL system to provide accurate absolute positioning:
 - GPS receiver operating with either RTK or differential corrections (Leica 500 system);
 - Gyro compass (TSS Meridian Surveyor);
 - Heave Compensator providing data for Heave Pitch and Roll (TSS HRP-10 MRU).
16. Prior to fieldwork, all instruments will be surveyed on the vessel to calculate offsets. The offset values will be configured into the SCOUT software. All external instruments were connected to the SCOUT surface command module. Both external and internal sensors will be calibrated before use
17. In the event of system failure, diver position will be determined by taped measurements from a shotline (positioned by GPS) and/or features mapped from geophysical data.

RECORDING SYSTEM

18. All archaeological recording will undertaken using Wessex Archaeology's bespoke digital recording system 'Diva'. Diva is a real time recording system working with three-dimensional position information. It comprises a Microsoft Access database working in conjunction with ESRI ArcGIS 9.0. The database is used to store the information and the GIS is used to provide a graphic display and to georeference information.
19. The position of the tracked diver is output from the Sonardyne SCOUT surface command module in real world co-ordinates into the Diva system and displayed in real time with geophysical data stored in the GIS system. The diver track can also be displayed and saved separately on the SCOUT system.
20. Observations made by divers will be entered into the database by the archaeological recorder on board the vessel. These observations, stored in the Diva database, include the three-dimensional position, comments typed in by the recorder and mapping labels for display in the GIS system.
21. Diver observations can be displayed as different layers in ArcGIS, grouped for example by mapping labels, observation type, etc.
22. Diver observations will be used to correlate separate records for contexts, finds, samples, photographs and so on.
23. The Diva system can operate independent of acoustic tracking, though positions have to be recorded manually instead of being provided automatically. In the event that Diva fails, paper records will be maintained.

APPENDIX II. DIVING

MANAGEMENT

1. Diving will be carried out under the Diving at Work Regulations 1997.
2. Wessex Archaeology will apply the Approved Code of Practice (ACOP) for *Commercial Diving Projects Inland/Inshore* (HSC 1998).
3. Unless otherwise stated, Wessex Archaeology will be the Diving Contractor and will meet its obligations as such under the applicable regulations.
4. Wessex Archaeology understands that the Port of London Authority will be the Client, and will meet their obligations under the applicable regulations.
5. Wessex Archaeology's operations will be subject to periodic inspection by its Health and Safety Co-ordinator, and by its health and safety consultants.

DIVING PROJECT PLAN

6. Diving operations will be subject to preparation of a diving project plan (DPP) based on a risk assessment, as provided for in the Diving at Work Regulations 1997. Wessex Archaeology prepares its DPP in three parts:
 - Part I (DPP I) is the Generic Risk Assessment and Standard Operating Rules.
 - Part II (DPP II) is the Project Risk Assessment and Diving Project Plan. A DPP II is prepared for each diving project by the Project Manager, and copied to the Supervisor(s), other members of the diving team, other relevant people (boat crew, client etc.) and to Wessex Archaeology's Health and Safety Co-ordinator.
 - Part III (DPP III) is the Operation Risk Assessment and Diving Project Plan for each diving operation, which takes the form of a checklist in the diving operation record. It is to be compiled by the Supervisor at the start of each diving operation. DPP III constitutes an on-site review of the risk assessment and diving project plan.

TEAM SIZE AND STRUCTURE

7. The diving team used by Wessex Archaeology will be no less than four. In addition, an archaeological recorder will be present. The team will alternate, subject to competence, in the following roles: Supervisor; Diver; Standby Diver; Tender; Archaeological Recorder.
8. All members of the diving team will be qualified to HSE III or above and in First Aid at Work, and will have a valid and in-date medical certificate. Supervisors will be appointed in writing and will normally be certified under the ADC Diving Supervisor scheme.
9. The vessel crew will not be counted as part of the diving team. However, as the vessel will be moored during diving operations, the crew will be on hand to render assistance if required.

DIVING PROCEDURES

10. Wessex Archaeology diving operations will be conducted using Surface Supplied Diving Equipment (SSDE). Both diver and standby will be equipped with SSDE. The breathing gas will be air, supplied to the diver via an umbilical from a high-pressure bank on the surface. In addition to the bank there will be a HP reserve on the surface, and the diver/standby will be equipped with a bailout cylinder. The high pressure bank will be recharged with compressed breathing air on the diving vessel between diving operations. Umbilicals will include lifeline, hard wire communications and pneumo.
11. Every dive will be recorded on miniDV tape using a colourwatch digital video system with hat mounted camera.

APPENDIX III. NAVIGATION, SEAMANSHIP AND MARINE SAFETY

1. Wessex Archaeology proposes to contract the 23 metre vessel the *Flat Holm* for the duration of the diving work. The crew and diving team will be accommodated on board the vessel.
2. The vessel is equipped with 2 x 5KVA generators supplying 240V AC. The vessel is managed by Gardline Environmental and registered in Lowestoft, Norfolk, UK.
3. The vessel is MCA CoP Category 2 (60 miles) and is licensed to carry 12 passengers plus two crew. As indicated above, Wessex Archaeology will prepare a specific risk assessment in respect of general boat-based activities. Overall responsibility for navigation, seamanship and marine safety will rest with the vessel Master. The relationship between the Master and crew, Wessex Archaeology's staff and the diving supervisor will be set out explicitly in the DPP II, and in risk assessments for general boat-based activities. Diving operations will be conducted from the starboard side of the vessel.
4. In addition to their previous general experience of marine operations, Wessex Archaeology Coastal and Marine staff receive training in sea survival, VHF operation and navigation/small boat handling. Non- Coastal and Marine staff visiting the diving vessel will be subject to specific health and safety induction. Wessex Archaeology provides its staff with suitable marine PPE, including wet-weather gear, auto-inflating lifejackets and safety footwear.

APPENDIX IV. FINDS MANAGEMENT

DEFINITIONS AND PRINCIPLES

1. The finds anticipated in the course of the London Gateway Wreck Clearance fall into two principal categories
 - Finds that are of archaeological, historical or cultural interest.
 - Finds that are of no archaeological, historical or cultural interest.
2. All finds that are of archaeological etc. interest will form the material archive of the project. Decisions regarding recording, handling, treatment, disposal etc. will be informed by archaeological and archival standards. Records and photographs etc. of such finds will be incorporated within the project archive.
3. Finds that are not of archaeological etc. interest will be discarded by WA and handed to the PLA as soon as is convenient. Any records or photographs obtained by WA will be incorporated within the project archive, noting that the material was discarded.
4. Both categories – finds of archaeological etc. interest and finds of no archaeological interest – are also likely to fall within one or more other categories to which additional legal provisions apply, namely:
 - ‘Wreck’
 - Ordnance
 - Military aircraft
 - Human remains
5. Ordnance, military aircraft and human remains all warrant special procedures, which are detailed below.
6. ‘Wreck’ includes all forms of material lost or deposited from a vessel, including (elements of) hull, propulsion, fittings, cargo, personal possessions etc. ‘Wreck’ also includes material lost or deposited from aircraft.
7. It has been agreed that wreck that is not of archaeological etc. interest will be subject to the PLA’s powers to dispose of wreck as set out in Section 120 of the Port of London Act 1968.
8. Wreck that is of archaeological etc. interest will be subject to the procedures relating to wreck in the Merchant Shipping Act 1995.
9. Finds that are not wreck include items deposited other than by a vessel or aircraft, including prehistoric finds deposited at the coast or on former landsurfaces, and (elements of) coastal, navigational and military infrastructure constructed on the shore or seabed.
10. For the purposes of these procedures, ‘disposal’ is taken to mean the handover of finds to the organisation or individual that is taking responsibility for their subsequent curation or care, which may be the owner or another party. ‘Discard’ is taken to mean that finds will not be subject to further curation or care. WA regards itself as being responsible for any finds that it discovers up until the point of disposal or discard.

11. It is anticipated that the archive (finds; paper; digital) arising from LG Wreck Clearance will be deposited on the basis of agreement prior to fieldwork between the PLA and a recognised archival institution. WA will observe the requirements of the archival institution in numbering and ordering project finds and documentation in the course of fieldwork. It is anticipated that the archive will be deposited following implementation of the proposals for analysis and publication made in the post-excavation assessment.
12. Procedures for finds and samples will be guided by the IFA *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials*, 2001, and guidance provided by the archival institution.

GENERAL PROCEDURES

13. Except in the case of ordnance etc., military aircraft and human remains (see below), the procedures set out here will generally come into effect upon recovery of the find to the surface.
14. Finds will normally be held by WA. For extensive assemblages and large, unwieldy or otherwise sensitive finds, provision may be made – by prior agreement – for finds to be transferred to and held by an appropriate institution.
15. Finds that are not ‘wreck’ and which are of archaeological, historical or cultural interest will be held by WA pending decisions on ownership, disposal and/or discard. Normally, the owner of the seabed will be the owner of finds that are not wreck. The permission of the landowner to donate finds that are not wreck to the organisation curating the archive will be sought.
16. Finds that are ‘wreck’ and which are of archaeological, historical or cultural interest are subject to the Merchant Shipping Act 1995. It is the PLA’s responsibility to notify the Receiver about wreck that is of archaeological interest found or taken into possession of WA in the course of its services to PLA. WA will prepare a droit and a list of wreck on behalf of the PLA, to be signed and sent to the receiver by the PLA’s River Regime and Environment Manager. Such droits and lists will be prepared and submitted periodically (e.g. monthly or at the close of the relevant phase of site investigations) by WA to the PLA RREM. At the end of the project a list of finds will be provided to the RoW by the PLA.
17. It is noted that owners have up to one year to make a claim to the Receiver in respect of wreck and it is anticipated that the Receiver will not generally make a decision about disposal in less than one year. However, an earlier decision will be sought under Section 240 of the Merchant Shipping Act 1995 if the wreck is so perishable that early disposal (to a museum capable of providing active conservation, for example) will favour the survival of the find.
18. Pending the decision of the Receiver, wreck will be held by WA on behalf of the PLA. WA will, on behalf of PLA, comply with directions given by the Receiver. WA will inform the Receiver of any change in the location where the finds are held.

FINDS: ORDNANCE, MILITARY AIRCRAFT AND HUMAN REMAINS

19. Procedures for reporting ordnance, military aircraft and human remains will normally come into effect upon discovery, i.e. with the material still on the seabed, unless the character of the find only becomes apparent upon recovery.

20. Any finds that are suspected of being ordnance, firearms, explosives etc. will be reported immediately by WA to the PLA's River Regime and Environment Manager (PLA RREM). The PLA RREM will inform the Joint Services EOD Operations Centre. Any subsequent actions will be guided by advice received from JS EOD.
21. Any finds that are suspected of being military aircraft will be reported immediately to the PLA RREM. The PLA RREM will inform the Service Personnel and Veterans Agency (SPVA: Joint Casualty and Compassionate Centre – SO3 Historic Casualty Casework). Any subsequent actions will be guided by *Crashed Military Aircraft of Historical Interest: Licensing of Excavations in the UK – Guidance Notes for Recovery Groups*, April 2007, and by advice received from SPVA. In the case of a military aircraft being investigated under licence, any human remains will be reported immediately in accordance with paragraph 14 of *Guidance Notes for Recovery Groups*, April 2007.
22. In the case of any other human remains, as of 1st June 2007 the requirement for issuing and conditions attached to licences for the excavation of human remains is subject to legal review.
23. Until such time as the legal position has been clarified by the Ministry of Justice, WA will, in the event of discovery of human remains, immediately inform the PLA RREM. The PLA RREM will inform the Coroner, the Police and the Ministry of Justice via submission of the relevant application form.
24. The human remains will initially be left *in situ*, covered and protected. Where a licence for their excavation is issued by the Ministry of Justice, the requirements of that licence will be followed.
25. Where the Ministry of Justice is unable to issue a licence and it is reasonably determined that the remains are likely to be subject to further unavoidable disturbance or deterioration, the PLA RREM will advise the Ministry of Justice of their intention to excavate the remains with due decency and in accordance with the general conditions formerly attached to licences issued for excavation of human remains under similar circumstances.
26. Should human remains be excavated and recovered, all excavation and post-excavation will be in accordance with the standards set out in the IFA *Technical Paper No 7 Guidelines to the Standards for Recording Human Remains* (IFA 2004).
27. The final placing of human remains following analysis will be subject to the requirements of the Ministry of Justice Licence.
28. As ordnance, military aircraft and human remains may also be of archaeological etc. interest, and constitute or be immediately associated with 'wreck', then the general procedures set out below will also apply, insofar as they are compatible with the special procedures set out above.

HOLDING AND TRANSPORTING FINDS

29. WA will provide and maintain suitable facilities onboard the diving vessel for a reasonable quantity of small and medium sized finds to be held passively. Generally, WA will keep finds onboard until there is a suitable opportunity to transport the material to its Salisbury base.
30. Where extensive recoveries are anticipated, additional onboard provision will be made.

31. If necessary, WA will set up a suitable temporary local facility onshore, within which the finds will remain the responsibility of WA.
32. WA will seek to transport finds between the diving vessel, any local facility, and WA's Salisbury base in the course of its normal operations. However, WA will arrange additional transport of finds if necessary due to volume, storage constraints, urgent treatment etc.
33. In the case of large, unwieldy or otherwise sensitive finds, special arrangements will be made for handling, storing, transporting etc. the find. Where possible, these arrangements will be made prior to the find being recovered from the seabed.
34. WA maintains facilities at its Salisbury base to hold passively a reasonable quantity of small and medium sized finds. This provision will be maintained for up to one year after recovery pending implementation of decisions on disposal/discard. WA may hold finds for more than one year after recovery if decisions and/or their implementation are delayed.

FINDS PROCESSING

35. All retained finds will be registered in WA's Finds Management database and any special requirements noted. A monitoring and maintenance programme will be prepared and implemented.
36. All retained finds will be processed in accordance with the Institute of Field Archaeologists' *Standard and guidance for the collection, documentation, conservation and research of archaeological material* (2005). All finds will be recorded and labelled appropriately.
37. Objects that require immediate conservation treatment to prevent deterioration will be treated according to guidelines laid down in *First Aid for Underwater Finds* (Robinson 1998). WA will make a full record of any treatment given and these records will form part of the archive.
38. Finds handling and initial processing will normally be carried out by WA's field staff, with telephone/email support from WA Finds Staff based in Salisbury. In the event that finds need to be assessed by WA Finds Staff onboard or at any local facility, or external advice is required onboard or at any local facility, WA will make appropriate provision.

CONSERVATION OF FINDS

39. All material held by WA will be subject to a Conservation Assessment within four weeks after recovery to gauge whether special measures are required while the material is being held. This Conservation Assessment will be carried out by WA with advice from Wiltshire Conservation Centre and/or other appropriate specialists. In some cases it may be more appropriate to carry out all or part of the Conservation Assessment at an earlier stage - in advance of recovery, or onboard immediately following recovery, for example.
40. WA will implement recommendations arising from the Conservation Assessment for the duration that finds are held by WA.

41. Where no special measures are recommended, finds will be conserved, bagged and boxed in accordance with guidelines set out in the United Kingdom's Institute for Conservation's *Conservation Guidelines No 2* (UKIC 1984).

SAMPLES

42. Deposits (i.e. sediments) of archaeological/historical/cultural interest that do not comprise artefactual remains will not be considered to be 'finds' but may be subject to sampling. Any artefactual material subsequently discovered in the course of processing such samples will be treated as finds thereafter.
43. Selection of palaeoenvironmental samples for processing will be undertaken on the advice of WA's Environmental Staff. Between 50% and 100% of samples will be processed. Processing and assessment of samples shall follow the following guidelines:
 - Bulk samples selected for processing will be wet-sieved/floated and washed over a 500 μ mesh for the recovery of palaeobotanical and other organic remains, and refloated to maximise recovery;
 - Non-organic residues will be washed through a nest of sieves of 10mm, 5mm, 2mm and 1mm mesh to maximise finds recovery;
 - Both organic and non-organic residues will be dried under controlled conditions;
 - The dried inorganic residues will be sorted for small finds or any non-buoyant palaeoenvironmental remains and scanned with a magnet to recover ferrous debris such as hammerscale;
 - The dried organic fractions will be sorted under a light microscope to identify the range of species or other material on a presence/absence basis, the degree of preservation of the bio-archaeological material and the rough proportions of different categories of material present;
 - In the event that waterlogged deposits are sampled, further processing will be undertaken as appropriate, including paraffin flotation to recover insect remains. Any such remains will be scanned to identify and assess their potential;
 - All organic residues will be stabilised and preserved for storage.

APPENDIX V. ARCHAEOLOGICAL PROTOCOL FOR DREDGING (APD)

To follow.

APPENDIX VI. ARCHAEOLOGICAL EXCLUSION ZONES

To follow.