7982: *London* Protected Wreck Site: Tracked Diver Survey & Affiliated Volunteer Capacity Building

TENDER
for
Historic England

MSDS Marine
December 2020

MSDS19127

Cover Images

Top Row, Left to Right:
Licensee Steven Ellis recording finds from the *London* during the 2014 – 2016 excavation project. MSDS Marine were the archaeological fieldwork and diving project managers.

Affiliated volunteers Steven Ellis and Steve Meddle alongside MSDS Marine archaeologists and divers following recovery of the gun carriage in 2015.

Sidescan survey image of the *London* site 1. Data collected and processed by MSDS Marine, on behalf of Cotswold Archaeology funded by Historic England in 2016.

Middle Row, Left to Right:
An MSDS Marine diver excavating the *London* during the 2014 – 2016 excavation project.

Steven Ellis, Licensee, diving on the site of the *London* with MSDS Marine providing the role of Dive Contractor during filming for National Geographic Drain the Oceans.

Mark James, MSDS Marine, assisting Licensee Steve Ellis, alongside team member Carol Ellis on site in 2014.

Bottom Row, Left to Right:
Extents of *London* site 2 as identified during HE Project 7892.

Sally Evans, Senior Project Officer, on site in 2016 recording excavated material.

Steven Ellis and Michael Pitts filming for National Geographic Drain the Oceans on the *London* in 2019.

London Protected Wreck Site: Tracked Diver Survey and Affiliated Volunteer Capacity Building

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1.0 Project Summary

1.0.1 This project will enable the team of affiliated volunteers working on the *London* protected wreck site to be embedded within the MSDS Marine HSE dive team to enable a tracked diver survey of the site. The Stage 3 multibeam bathymetry collected in May 2020 will form the base map for the diver tracked survey in this project. A specialist archaeologist from MSDS Marine will then work with the affiliated team of volunteers during the post-fieldwork recording process to digitise the existing site plan and to combine the multibeam bathymetry for the site with the existing site plan and dive track data. Training and equipment will be provided that will ensure the team of affiliated volunteers are able to maintain, and add to, the site records in future.

1.0.2 Covid-19 planning and mitigation has been addressed throughout this Tender document.

2.0 Background

2.0.1 The *London* is an important 17th Century Protected Wreck Site comprising two areas of extensive submerged archaeological remains lying in the Thames Estuary off Southend on Sea. First designated in October 2008, the site(s) has been subject to detailed, but limited, archaeological investigation in order to provide specific information to manage items at risk from natural and anthropogenic erosion and accretion. Recovered material has formed a key feature of a new gallery in the Central Museum in Southend on Sea and significant artefacts have been loaned to the National Maritime Museum's gallery on Tudor and Stuart Seafarers.

2.0.2 The wreck is managed by Historic England for the Department for Digital, Culture, Media and Sport (DCMS). Despite a recent programme of evaluation and regular monitoring by the highly-motivated voluntary Licensed team led by Steven Ellis, with oversight provided by the Nominated Archaeologist Mark Beattie-Edwards, the site is still classed as at risk on the Heritage at Risk Register.

2.0.3 In 2019 Historic England identified a lack of knowledge regarding the extent and depth of buried archaeological remains across the two designated areas as a key gap in their understanding of the *London* Protected Wreck Site. Following a tender process, MSDS Marine were contracted to provide a short programme of geophysical survey across both sites in order to provide full and definitive information about the nature and extent of buried deposits associated with the *London* protected wreck site.

2.0.4 The staged project included a review of existing data-sets and reprocessing of existing data to gain as complete a picture of the wreck as possible. The Stage 2 report submitted in September 2019 made a series of recommendations to help enable Historic England, and their partners, to move from reactive management to proactive management of the wreck site. Recommendation two was a diver survey with acoustic tracking[1].

Recommendation 2 – Diver Survey with Acoustic Tracking

Since the start of intrusive investigations in 2014, there has been no survey of the site using an acoustic diver tracking system. Whilst this was planned during the excavation in 2016, time and equipment constraints made this not feasible in practice at the time. As a result, all survey has been undertaken using traditional methods; this coupled with the poor visibility and challenging conditions means that positional accuracy of features cannot be guaranteed. Discussions with the current licensee suggest not all of the outlying, and unidentified features have been investigated due to limited dive time and challenging conditions for navigation.

The second recommendation is that a program of ground truthing and feature positioning be undertaken on both sites following the collection of current multibeam data. This will allow divers to be guided, using the multibeam as a base map, to outlying features for identification. It will further allow the accurate positioning of known feature on the site to create a

[1] MSDS Marine, 2019, 7892: *London* Protected Wreck: Remote Sensing. Stage 2: Assessment of 2009 and 2016 Datasets, unpublished report for Historic England. Ref. 2019/MSDS19115/2

comprehensive digital site plan. In addition, it will help inform future management and the possible re-designation of the sites to include all archaeological material related to the *London*.

2.0.5 Stage 3 involved the collection of high resolution multibeam bathymetry data in May 2020. This was reported on in August 2020[2].

2.0.6 This project follows on from the earlier stages of 7892 as an additional stage following a single tender action from Historic England. It addresses Recommendation 2 made in September 2019 and will help inform future management and the possible re-designation of the sites to include all archaeological material related to the *London*.

2.0.7 Given the current global Covid-19 pandemic this Project has been designed to be Covid-19 Secure and will follow all current guidance to ensure a Covid-secure workplace for all participants.

[2] MSDS Marine, 2020 *HE Project 7892* London *Protected Wreck Site: Remote Sensing. Stage 3: High Resolution Multibeam Bathymetry Report*, unpublished report for Historic England. Ref 2020/MSDS19115/3

3.0 Aims & Objectives

3.1 Aims

3.1.1 The aims of the project are to:

1. Undertake a tracked diver survey of the *London,* ensuring that the team of affiliated volunteers are engaged and supported
2. Create a digitised and accurately positioned site plan
3. Provide training and equipment to the team of affiliated volunteers to enable them to have the skills required to maintain the site plan in future and to enable increased accuracy in the positioning of finds and features

3.2 Objectives

3.2.1 Aim 1 will be achieved by the mobilisation of an HSE compliant dive team by MSDS Marine which embeds Steven Ellis and Steve Meddle from the affiliated volunteer team and Mark Beattie Edwards, the sites nominated archaeologist. Acoustic tracking will be provided that enables key features and artefacts within the site to be tracked accurately.

3.2.2 Aim 2 will be informed by the results of fieldwork. MSDS Marine will work with the affiliated volunteer team to create a digitised and accurately positioned site plan that can be imported into the existing Site Recorder project for the site. This will provide an accurate site plan up to the end of fieldwork taking place. It will be created in such a way that the affiliated volunteer team can add to it and maintain it using existing control points which will be plotted in during the tracked diver survey.

3.2.3 Aim 3 will be achieved by providing the training and equipment that the affiliate volunteer team need to maintain the site plan in future. MSDS Marine will host an intensive three-day training session that enables the team to develop the skills they need internally to maintain the site plan going forwards. In addition, MSDS Marine will provide support services to the team once they are back in their own setting and as they start to use the system. This will ensure the knowledge learned during the training becomes fully imbedded and that the team have the skills needed to put the knowledge into practice and are supported in their development.

4.0 Business Case

4.1 Heritage 2020 and the Historic England Corporate Plan

4.1.1 Heritage 2020 sets out how heritage organisations will work together to benefit the historic environment. It is coordinated on behalf of the whole sector by the Historic Environment Forum. The Historic England Corporate Plan[3] forms the contribution of Historic England to Heritage 2020.

4.1.2 The project directly addresses the strategic challenge identified in the Historic England Corporate Plan of engaging with new audiences. It actively supports Aim 1.3 of the Historic England Corporate Plan which seeks to support people who want to care for or stand up for an area or place - in this case the team of local affiliated volunteers who are involved in caring for the *London* protected wreck site. MSDS Marine will be proactive in working with the affiliated volunteer team through the life cycle of the project, and beyond, to ensure that they are engaged and working in partnership with the heritage sector for the benefit of the historic environment as a whole.

4.1.3 The project directly addresses the strategic challenge identified in the Historic England Corporate Plan of strengthening national capacity and the resilience of the heritage sector. The project actively supports Aim 4.1 by Historic England providing a grant and working collaboratively with MSDS Marine, the Nautical Archaeology Society, the *London* Shipwreck Trust and the affiliated volunteer team to sustain and strengthen capability and increase the effectiveness of the local community group who are actively working on the site.

4.2 Tailored Review of Historic England 2020

4.2.1 The Tailored Review of Historic England was published in November 2020. Tailored Reviews (TRs) provide assurance to Ministers and departmental Principal Accounting Officers of the on-going need for the functions of its Non-Departmental Public Bodies, (NDPBs) also known as Arm's Length Bodies (ALBs) and provide an opportunity for ALBs themselves to reflect on their work and how they operate.

4.2.2 The Review identified that consultation had revealed it was felt Historic England are not doing enough to protected wreck sites[4].

4.2.3 As a high-profile project this will show the wider sector that Historic England are addressing maritime heritage and responding to threats through positive action.

[3] *Historic England Three Year Corporate Plan 2018 – 21* https://historicengland.org.uk/images-books/publications/he-corp-plan-2018-21/three-year-corp-plan-2018-21/, accessed 4th November 2019.
[4] 2020, *Tailored Review of Historic England*

4.3 Historic England Marine and Coastal Vision Statement 2018

4.3.1 The proposed project is consistent with Historic England's priorities identified in the 2017 Marine and Coastal Vision Statement[5] published in January 2018

4.3.2 Priority 3 aims to:

> Engage stakeholders in the protection and enhancement of marine and coastal heritage assets through appropriate designation and management, including enhancing access to marine records held by Historic England (as part of the cross-sector Heritage Information Access Strategy (HIAS).

4.3.3 It will help achieve Priority 3 and ensure that stakeholders are engaged with the protection of marine and coastal heritage assets.

4.3.4 Priority 6 aims to:

> Enable informed conservation through capacity-building, through an enhanced and more accessible National Maritime Record for England and through expert-led assessment of the significance of marine archaeological remains.

4.3.5 It will help achieve Priority 6 and ensure that there is increased capacity and skills within the team of affiliated volunteers and that there is increased expert-led assessment of the significance of the site through the survey leading to an enhanced understanding of the site.

4.4 National Planning Policy Framework

4.4.1 The National Planning Policy Framework (NPFF) 2018[6] sets out the Government's planning policies for England and how they should be applied. The NPFF recognises the need to protect and manage marine cultural heritage in a manner appropriate to its significance.

4.4.2 The project will contribute to the aims of the NPFF by providing up-to-date evidence about the historic environment that will enable local authorities, and others, to assess the significance of the *London.*

4.5 DEFRA Marine Strategy Part 1

4.5.1 The Department for Environment, Food & Rural Affairs (DEFRA) has published the strategy; Marine Strategy part one: UK updated assessment and Good Environmental Status to achieve a better protection of UK seas[7].

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[5] Historic England, 2018, *Historic England's Marine and Coastal Network Vision Statement and Priorities*

[6] National Planning Policy Framework, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf, 5th November 2019.

[7] DEFRA, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/841246/marine-strategy-part1-october19.pdf, accessed 5th November 2019.

4.5.2 The strategy includes recognition of the significance of marine heritage: There is increasing awareness of the importance of our underwater cultural heritage and the historic environment which has significant social/cultural value. Plans are in place to consider whether social and cultural indicators and targets could be developed, and this will include a consideration of marine cultural heritage and the historic environment. The Strategy recognises that the involvement of communities in marine conservation and planning and its local benefits is important. Central to the ethos of this project is engaging members of the local community to deliver benefits to the marine historic environment.

4.6 Public Value Framework

4.6.1 In 2018/19 Historic England will receive £91.6m in grant-in-aid from the Department for Digital, Culture, Media and Sport[8]. As a public body Historic England need to ensure they turn public expenditure into outcomes that citizens value. The 2017 report led by Sir Michael Barber on behalf of UK Treasury introduced the concept of the Public Value Framework and establishing a set of criteria that, if fulfilled, would mean the chance of optimal public spending being delivered from a particular area of spending were maximised.

4.6.2 This Tender document has been created with the following twenty public value framework questions from Historic England in mind and has addressed them fully where possible. The project will seek to ensure optimum value for money and that public value is delivered in all areas.

PILLAR 1 Assured Alignment	PILLAR 2 Appropriate Resourcing	PILLAR 3 Public Support	PILLAR 4 Capacity Development
Clarity of goals: How well does the project address the published goals of HE?	**Measurement of unit costs:** Has good use been made of unit costs to allow easy assessment of efficiency?	**Stakeholder needs:** Have key stakeholders been identified clearly and are their needs well understood?	**Well-designed evaluation:** Is a proportionate evaluation built into the project* to enable learning about what works and for whom?
Appropriate KPIs: Is performance measurable at different points in the delivery chain?	**Detailed resource plan:** Does the financial plan show how costs will be met, including unexpected costs?	**Public perceptions:** Are the drivers of public support understood and is support evidenced?	**Use of new technologies:** Has the project looked for opportunities to experiment and improve?

[8] Taken from the Historic England website https://historicengland.org.uk/about/who-we-are/how-we-are-funded/, accessed 17THOctober 2019.

Links to other work: Are interdependencies recognised and any consequent risks managed	**Timely information to managers:** will decisionmakers be given the right information at the right time?	**User experience:** To what extent does the project demonstrate an appreciation of the value of great user experiences?	**Clear accountability:** Is everyone involved going to be clear about their roles and responsibilities?
Quality of track record: Are any concerns about project staff addressed appropriately?	**Optimised funding mix:** Have funding options been properly explored?	**Public participation:** Has enough effort been made to enable public participation?	**Cross-boundary collaboration:** Has the potential for collaboration been properly explored?
Measures drive good behaviour: Might the measures create perverse incentives?	**Awareness of knock-on costs:** Has the risk of cost shifting been assessed and mitigated?	**Stakeholder influencing:** How will stakeholders be made aware of the project and its results	**Resilience:** Is it clear how the system is going to be fitter for the future as a result of the project?

Table 1: Historic England's public value framework 20 questions in full[9].

4.7 *London* Conservation Statement and Management Plan

4.7.1 The *London* Conservation Statement and Management Plan[10] was produced to enable local and regional stakeholder involvement to help Historic England achieve its aspirations for the conservation management of the *London* so as to balance protection with economic and social needs. The principal aim of the Plan is to identify a shared vision of how the values and features of the *London* can be conserved, maintained and enhanced.

4.7.2 This project contributes to the following aims of the plan:

Policy 3 - Mechanisms will continue to be identified and implemented so as to continue to develop shared ownership and partnership working.

4.7.3 This project is very much a partnership project with members of the licensed team and the Nominated Archaeologist embedded within the core MSDS Marine team.

Policy 5 - Works will be undertaken, where required, that will enable work on the site to be undertaken in accordance with relevant standards and guidance using licensed divers; this will enable remaining questions to be addressed.

4.7.4 All work will be undertaken following all archaeological standard as outlined in this tender document. The licensed dive team have been included within the core MSDS Marine dive team.

[9] Historic England, 2019 Guidance for Tendered Projects: Heritage Protection Commissions Programme

[10] Evans, S, 2017 *The London: Updated Conservation Statement and Management Plan,* Historic England Research Report 86/2017

Policy 6 - All stakeholders will continue to support and provide guidance for a programme of environmental monitoring, sediment monitoring and targeted recording.

4.7.5 This project is to facilitate targeted recording on the site and involves all stakeholders thus addressing Policy 6.

Policy 9 - If site monitoring indicates that significant remains are being lost, or that preservation in situ is not feasible, a programme of staged archaeological work should be considered subject to the submission of a suitable Project Design.

4.7.6 This project will look at the remains on the seabed against those seen on the Multibeam bathymetry data. It will enable an independent archaeological assessment of the remains on the seabed and enable management decisions to be made by Historic England for the future.

5.0 Stakeholders and Interfaces

5.1 Interfaces

5.1.1 This project interfaces with the forthcoming publication on the *London* that is being led by Cotswold Archaeology and funded by Historic England following on from the excavation that took place between 2014 and 2016. Where possible, any results from the remote sensing will be made available to the publication team to help inform the publication.

5.1.2 The project interfaces with the *London* Conservation Statement and Management Plan by ensuring that it contributes to the management policies identified within the Plan at every possible opportunity.

5.1.3 This project interfaces with the report by Rob Hedge and Aisling Nash commissioned by Historic England, *Assessing the Value of Community Generated Historic Environment Research.* This project determined the value of community generated research in contributing to the knowledge base of the sector and made a number of recommendations, which included greater transparency in the roles, responsibilities and processes within the historic environment sector. The recommendations given in this report will be adhered to where possible in the planning of this project to ensure that the voluntary groups engaged with are made aware of applicable research frameworks notably the *Maritime and Marine Historic Research Framework*[11].

5.1.4 This project interfaces with the *Historic England Affiliated Volunteer Recruitment and Engagement Project* (HE Project 7867) that MSDS Marine are currently undertaking, commissioned by Historic England. In the marine environment the role of a voluntary Licensee and their team has long been recognised as essential to the system that helps to manage historic wreck sites in England's territorial waters. However, it is also recognised throughout the sector that the demographic of licensee teams is one of an ageing population. This project will use any lessons learnt in the course of the 7867 project and build on the networks established.

5.1.5 This project interfaces with all current work on sites designated under the Protection of Wrecks Act 1973. MSDS Marine already regularly provide advice and support to Licensees, Affiliated Volunteers and their teams. We are recognised as an approachable organisation and regularly receive requests for our advice and support - and give it freely. MSDS Marine employees are all given an additional two weeks paid annual leave that can be used at the discretion of the Directors of MSDS Marine to help support work on protected wreck sites. Our employees have used this to work on sites including *Hazardous* and *Invincible*. In addition, we have links to many ongoing projects funded by Historic England, notably the work of Pascoe Archaeology Services on the Goodwin Sands to survey the *Northumberland*. These existing networks will be used to engage with stakeholders in the course of this project.

5.1.6 Following sign-off from Historic England reports will contribute to the enhancement of the National Record of the Historic Environment.

[11] Adams et al, 2013 *Maritime and Marine Historic Research Framework*

5.2 Capacity Building

5.2.1 MSDS Marine have experience employing early career professionals and providing dedicated CPD programmes to aid their development. Three current MSDS Marine employees, two Maritime Archaeologists and a Conservator, were recruited as early career professionals and are being aided in their career progression. In addition, MSDS Marine actively support students and early career professionals in the sector notably through providing work placement opportunities, volunteer fieldwork opportunities, and an annual grant for students to be used for training and equipment purchase[12].

5.2.2 Where possible, in the course of the project, opportunities for capacity and professional development will be taken. For example, MSDS Marine staff who have identified that they would like to undertake continuing professional development in post fieldwork data processing will be given the opportunity to attend the training sessions and become involved in the data processing. In addition, the opportunity for CPD will be extended to Steven Ellis and Mark Beattie Edwards as Licensee and Nominated Archaeologist for the site.

5.3 Stakeholders:

5.3.1 MSDS Marine have a proven track record of managing stakeholder relationships through involvement and consultation. Our experience working with a multitude of different stakeholders, in relation to our work on protected wreck sites in particular, has shown that positive relationships can be key to the ongoing successful management of heritage assets. Thus, we will ensure carefully managed and engaging stakeholder relationships are built throughout the course of the project. A communications plan produced by MSDS Marine, and signed off by Historic England, at the commencement of the project will ensure that all stakeholders are identified and that the level of engagement is agreed in advance.

5.3.2 The *London* wreck has its own unique set of stakeholders, which includes, but is not limited to the list in Table 1 below. Other individuals may, on occasion, wish to engage in the work. In this instance, Historic England will provide contact details as appropriate.

5.3.3 A key stakeholder for the project, and the wreck of the *London*, is Steven Ellis the current Licensee. MSDS Marine have been in contact with Steven prior to the submission of this project tender, Steven was fully supportive of the MSDS Marine tender and wishes to work with us to enhance the understanding of the site and the outcomes of the project.

5.3.4 The Nominated Archaeologist for the site is Mark Beattie-Edwards, Mark has also been contacted and is supportive of the MSDS Marine tender and also wishes to work with us to enhance the understanding of the site and the outcomes of the project.

[12] https://msdsmarine.com/en/awards/student-awards/, accessed 5th November 2019.

Stakeholder	Involvement
Historic England	Historic England will be the Client. Their input will be sought at all stages of the project. Hefin Meara will be the key contact throughout the project. Advice and input from specialist colleagues at Historic England will be sought at all stages of the project. Although the recovery of material is not a key aim of the project it is note that some high-risk material may be recovered during the course of the project. The mechanism for recovery is outlined further in 6.0 Methods and Scope. If material is recovered then Angela Middleton, Conservator at Historic England will be consulted. Any issues will be reported to Historic England. They will also be provided with a Highlight Report and End-of-Project Report.
The *London* Shipwreck Trust	The mission statement of the *London* Shipwreck Trust is to ***advance, promote and provide for the preservation of the "London" Shipwreck and its artefacts for the public benefit and to protect it for future generations.*** The project team will inform the *London* Shipwreck Trust of the project and offer a representative the opportunity to join the remote sensing team on site.
MoD	As the owners of the *London*, the MoD will be contacted via Historic England to inform them of the proposed work and to invite them to participate in fieldwork.
Affiliated volunteers, Licensee Teams, Nominated Archaeologists	Access to some designated assets in inshore waters is restricted, including on the *London*. Access is enabled on an individual or corporate basis through a statutory licensing regime. Such individuals and corporations are recognised as Historic England Affiliated Volunteers and are therefore key partners who may wish to be included on some field assessments and share knowledge. Project Manager, Alison James, has considerable experience of working with volunteers, as well as a Level 3 qualification in the Management of Volunteers from the Institute of Leadership and Management. As such, Alison will be able to work with volunteers to ensure the best long-term relationship with them for Historic England and the management of the historic environment. MSDS Marine have considerable experience of working with Licensees, Nominated Archaeologists and their teams. MSDS Marine have a proven track record of working with the Licensee team led by Steven Ellis and the sites Nominated Archaeologist Mark Beattie-Edwards. The Licensee team and Nominated Archaeologist will be invited to participate in work wherever possible and form part of the project team.
Nautical Archaeology Society	Mark Beattie-Edwards from the Nautical Archaeology Society (NAS) is the current nominated archaeologist for the site. In addition, the NAS are currently fundraising for the *London* through the Save the *London* campaign. Mark Beattie-Edwards will be invited to participate in work wherever possible and form part of the project team.

Protected Wreck Association	The project will ensure that the Protected Wreck Association (PWAssoc) are informed at all stages of the project and that opportunities for PWAssoc members are identified where possible to enable them to develop skills as deemed appropriate by Historic England.
Port of London Authority	Contact with the PLA will be two-fold: The PLA will be contacted in order to dovetail the diver fieldwork into any activity currently on-going within the estuary in order to try and minimise disturbance. The PLA will also be contacted prior to works to obtain any necessary permissions.
Southend of Sea Borough Council	The project team will inform Southend on Sea Borough Council of the project and offer a representative the opportunity to join team on site.
Southend Museums	The project team will inform Southend Museum of the project. Subject to agreement from Historic England, and the fieldwork schedule, a talk about the fieldwork will be offered to local the Museum during the project at no additional cost to Historic England.
Kent and Essex Inshore Fisheries & Conservation Authority	Ten regional IFCAs manage the marine inshore environment around the coast of England. The IFCAs create and enforce local byelaws, as well as enforcing relevant national and European fisheries legislation. IFCA officers conduct patrols and inspections at sea as well as regular patrols around the coast, visiting ports and harbours. IFCA officers have the power to board vessels, inspect places of work, vessels and vehicles to determine if a fisheries offence has been committed. If officers believe an offence has been committed, they have the power to seize and detain catch, gear and equipment and to order vessels to return to port where they can be detained. Representatives of Kent and Essex IFCA's will be contacted in advance of work and invited to attend fieldwork to help foster links that ensure future good management of heritage assets.
Historic Environment Team, Essex County Council	The project team will inform Essex County Council Historic Environment Team of the project and offer a representative the opportunity to join the fieldwork team on site.
Marine Management Organisation	The Marine Management Organisation (MMO) licence, regulate and plan marine activities in the seas around England so that they're carried out in a sustainable way. It is anticipated that the project will not require a marine licence issued by the MMO. However, contact with the MMO will be maintained to ensure any necessary licence permissions are in place. MMO staff will be invited to attend fieldwork to help foster links that ensure future good management of heritage assets.

Land Owners	The Crown Estate are the principal landowners of the seabed around England including the seabed on which the *London* lies. MSDS Marine will ensure that any necessary permissions from the Crown Estate, and other landowners as relevant, will be sought prior to commencement of work, however, it is no licensing requirements are anticipated.
Previous Contractors	Wessex Archaeology and Cotswold Archaeology have previously undertaken work on the site as identified in the *London* Conservation Statement and Management Plan. Where needed, they will be contacted during the planning phase to ensure all data relating to the site is in place.
Broadcast and Written Media	It is anticipated that due to the nature of the project it will be of interest to the broadcast and written media. This interest will be encouraged in order to promote the project. Interaction with the media will only be in association with Historic England's press office and the Historic England Project Manager. A communications plan will be produced by MSDS Marine for agreement with Historic England at the start of the project.
Social Media	Social media is likely to play a key role in the dissemination of the project. Subject to Historic England agreement, the project will use a suitable hashtag such as #WreckInvestigation, #MaritimeArchaeology or #MarineHeritageAsset along those already in use including #ProtectedWreck and #LondonWreck1665.A communications plan will be produced by MSDS Marine for agreement with Historic England at the start of the project.

Table 2: Project stakeholders

6.0 Methods and Scope

6.1 Stage 1 -3

6.1.1 Stages 1 -3 have already been completed as part of HE Project 7982. For completeness the Stages were:

Stage 1: Desk Based Assessment

6.0.2 The Stage 1 Desk Based Assessment identified extant geophysical data covering the *London Protected* Wreck Site. The report was followed by a stakeholder meeting to determine the next steps for Stage 2.

Stage 2: Sub-Bottom Profiler Assessment

6.1.1 Stage 2 was a side-by-side review of the sub-bottom profiler data held by MSDS Marine and Wessex Archaeology to enable a more informed approach to data collection and to identify the benefit of further data collection in Stage 3. The assessment established the extents of the wreckage, both on the surface and sub-surface, and made recommendations for further work which were discussed at a subsequent stakeholder meeting.

Stage 3: High Resolution Multibeam Bathymetry survey

6.1.2 Stage 3 was a high resolution multibeam bathymetry survey that formed Recommendation 1 in the Stage 2 report. This was undertaken in May 2020 and reported on in August 2020.

6.2 Stage 4a – Project Initiation

6.2.1 A Project team meeting will be held at the outset of the project with further project meetings taking place throughout the project life cycle as appropriate.

6.2.2 Liaison with identified stakeholders via email and phone calls will take place at the outset of the project. This will enable the identification of further potential stakeholders.

6.2.3 Highlight reports will be produced throughout the life cycle of the project at agreed stages.

6.3 Stage 4b – Tracked Diver Survey

6.3.1 The project will undertake a five-day tracked diver survey to record and position key features and artefacts on both sites of the *London,* referred to throughout as Site 1 and Site 2. It should be noted that this project methodology has been developed to take into account the existing budget from Historic England. Five days diving is an extremely short window to fully survey both areas of wreckage. MSDS Marine believe it can be done but priority will be given to Site 2 which is adjacent to the shipping channel and therefore considered at higher risk of immediate loss. Diving will be undertaken using SCUBA equipment owned by MSDS Marine. MSDS Marine will be the Diving Contractor and provide a full dive team for the project.

6.3.2 Affiliated volunteers Steven Ellis and Steve Meddle, and Nominated Archaeologist Mark Beattie-Edwards, will be imbedded within the MSDS Marine dive team. By using the Licensee and members of his team at the core of the project it ensures that they receive a high level of

one-to-one training, which will be of lasting benefit to the site. In addition, Michael Pitts, award winning underwater videographer, has been included within the core dive team. There is very limited underwater footage of the site currently, mainly due to the extremely poor visibility on the site. Michael Pitts has worked extensively with MSDS Marine in similar environments and has consistently shown his ability to capture underwater footage in difficult conditions. The footage will help increase knowledge of the site and be able to be used by all stakeholders to educate and engage people with the site. The footage can also be used to monitor change to the sites and as a baseline for future survey work.

6.3.3 For diving undertaken on SCUBA there will be a six-person dive team which will comprise of a supervisor, surface recovery diver, and four divers. If the risk assessment allows, and it is anticipated from prior site experience that it will, it may be possible to have two waves of two divers in the water during some slack water periods. Two slack water periods will be dived per day with divers working up to ten-hour days on the diving support vessel. On the short slack water, it is anticipated a single pair of divers will be deployed, and on the longer slack water four divers in two -pairs will be deployed dependant on conditions.

6.3.4 The experience of the dive team, and equipment owned by MSDS Marine, also allows for SSDE operations if required, although it is recognised that this would mean that members of the volunteer dive team would be unable to participate in the diving and would not be the preferred option.

6.3.5 It is anticipated the diving will be undertaken from the diving support vessel *Wessex Explorer* operated by Hayes Marine. *Wessex Explorer* is an MCA Category 2 workboat licensed to carry 12 personnel up to 60nm from a safe haven. The vessel has a large wheelhouse at deck level with a large survey desk and seating for four. The vessel is equipped with a galley, shower and toilet and heating throughout. The vessel operators have considerable experience of using *Wessex Explorer* for a number of full commercial diving applications included archaeological work. The vessel has a dive ladder, space for a compressor, a store area for diving equipment and a large indoor area for diving control.

6.3.6 To enable effective acoustic tracking the vessel will be anchored on a two or three-point mooring to enable a fixed position over the site to be achieved. The vessel crew have considerable experience in mooring in this configuration on archaeological projects, notably operating as the main vessel for diving contract work with Wessex Archaeology for a number of years.

6.3.7 MSDS Marine understand that operators such as Hayes Marine are unable to commit their time to a short project such as this as far in advance as this Tender. However, they have stated that *Wessex Explorer* have confirmed they will undertake the work if they can. If, however, they have other work which falls during the best diving window available then MSDS Marine will use *Spectrum 1* which is operated by Spectrum Offshore or *Assassin* operated by Predator Charters. MSDS Marine have existing relationships with both vessel operators and have worked with them extensively on other projects on protected wreck sites on behalf of Historic England. *Spectrum 1* is a 16.9m aluminium Category 2 MCA workboat. *Assassin* is a 15.25m Damen 1500 pushycat that again is MCA Category 2 coded.

6.3.8 The fixed nature of the diving support vessel means that a smaller safety support vessel, or RHIB, is required to enable recovery of any divers who may come off the site during the course of operations. The project will use the RHIB of Licensee Steven Ellis as a diving tender. This also enables the Licensee to easily access work when the main vessel will be based out of Queensborough in Essex, due to the restrictions of the tidal harbour at Leigh on Sea.

6.3.9 All members of the proposed diving team will be qualified to HSE SCUBA or equivalent and will have a valid and in-date HSE medical certificate. Supervisors will be appointed in writing by MSDS Marine. Provision will be made for Historic England employees and, where requested, other stakeholders including heritage specialists to dive as part of the dive team or as part of the dive operation, subject to possession of a valid medical and all of the requirements of applicable regulations and ACoPs being met.

6.3.10 SCUBA diving operations will be conducted using OTS Guardian full face masks with a 15-litre cylinder and a 3 litre (300 bar) bail out, or other suitable equipment as deemed appropriate for the depth, duration and environment. Communications with the surface will be via either through-water comms or hard-wired comms. High quality communications are essential to archaeological diving operations, not just for diver safety, but to ensure that information during the dive can be passed to the vessel for recording. Unfortunately, communications are also generally the least reliable item of equipment. To this end MSDS Marine solely use the OTS-2010 diver transceivers and STX-101 topside unit which we have used extensively and have found to be the most reliable.

6.3.11 A diving project plan has been produced for the project, see Annex G. This will be updated and reviewed prior to fieldwork commencing.

6.3.12 Each dive will be recorded digitally using GoPro cameras capable of or recording HD footage or Paralenz HD video cameras with communications recorded through the STX-101 topside unit.

6.3.13 The use of a four-person SCUBA team typically allows only one pair of divers to enter the water per slack water period, although there are exceptions on sites with longer slack water periods. Wherever feasible, MSDS Marine will always aim to field a six-person SCUBA team which allows two pairs of divers to enter the water in succession on each slack water period significantly increasing overall productivity, where tasks such as diver tracking are being undertaken an additional person will be required to enable the equipment to be operated independently of the core dive team. The increase in diving productivity is achievable through ensuring that a minimum of four full sets of equipment (plus spares) are available on each project.

6.3.14 Acoustic tracking will be used throughout diving fieldwork activities. The application of acoustic tracking technology for the accurate recording and positioning of marine archaeological sites has become more common in its use and has revolutionised the survey and positioning of underwater sites. During its development for archaeology, the use of tracking as a tool to 'draw' a site has frequently been envisaged. While this is not possible without considerable investment in equipment above that used in archaeology, the technology remains an extremely valuable component of underwater archaeological recording enabling:

- The location of targets in low visibility in-water conditions;

- Navigation around sites;
- The interrogation and geo-referencing of existing site plans and geophysical data;
- High levels of accuracy for the positions, and extent, of sites and search areas;
- The creation of fast accurate site 'sketch' plans, including the location of the main elements of the site;

6.3.15 MSDS Marine will use an Ultra Short Base Line (USBL) system to track in-water diver movements. This will be a Sonardyne Micro-Ranger 2 system, which has superseded the well-known SCOUT system. The system requires the mounting of a vessel-based transceiver which tracks a transponder attached to the divers. In addition, fixed beacons can be mounted to features to enable higher levels of accuracy to be obtained by the mobile tracking devices mounted to divers. This has been specified in consultation with acoustic tracking specialist Peter Holt. Peter will attend the mobilisation day to set up the system and ensure it is working correctly.

6.3.16 The USBL system works by calculating the range and bearing of the diver-mounted transponder to the transceiver. The transceiver will be mounted to the vessel below the water line on a side-mounted survey pole, which ensures repeatable accuracy in its location. The system will be coupled to a Vector Heading Sensor DGPS receiver ensuring a high level of positional accuracy. The system chosen will be capable of tracking up to four divers at a range of up to 500m. To ensure further positional accuracy the tracking system will be used alongside a programme that will provide an average position and smooth errors.

6.3.17 The diving will require a licence from the Department for Digital, Culture, Media and Sport (DCMS) issued on the recommendation of Historic England under the Protection of Wrecks Act, 1973. MSDS Marine will apply for a Corporate licence to undertake the work.

6.3.18 In addition, the project will require appropriate permissions from the Port of London Authority (PLA). MSDS Marine will contact the PLA to acquire permissions.

6.3.19 It should be noted that the *London* is heavily exposed and considered high risk in part due to the exposure of high-risk archaeological material that is lost through tidal action and marine boring organisms. MSDS Marine's overarching policy would be to not recover any archaeological material during the course of the contract, however, whilst it is not the intention of this project to recover archaeological material, discussions with the Licensee, Nominated Archaeologist and Hefin Meara at Historic England have indicated that some material may need to be recovered. The recovery of material would only take place when there is a clear, agreed, and ethical reason for doing so and only where an objective cannot be achieved with the material remaining *in situ*. This could include for research purposes in order to address gaps in knowledge identified in the sites Conservation Statement and Management Plan[13] or to aid in the management of the site. To this end five days of MSDS Marine conservation time have been built into the project for the recovery of mobile artefacts considered at high risk. Discussions

[13] Evans, S, 2017 *The London: Updated Conservation Statement and Management Plan,* Historic England Research Report 86/2017

with Historic England have agreed that it is preferable to plan for this in advance rather than at short notice during fieldwork.

6.3.20 It should be noted that agreement is already in place for the recovery of human remains. If human remains are discovered in the course of this project they will be positioned and recovered and will then fall into the existing protocol for the recovery of human remains with conservation being undertaken by Angela Middleton, Senior Conservator, at Historic England.

6.3.21 Exposed artefacts will be recorded by tracked diver survey and recorded in situ where possible and if time allows. If it is apparent that they are at danger of immediate loss they will be recovered to the diving support vessel. This ensures that valuable time is not lost on subsequent dives trying to relocate material that is likely to have moved and ensures that the diver tracking is the main focus of the project. Options for conversations with Historic England and the Dive Supervisor whilst the diver is in the water have been considered but it is felt not practical for a number of reasons:

- The Dive Supervisor needs to be focused on diver safety and tracking and this is a distraction that cannot be justified
- The location of the project means that a mobile phone reception cannot be guaranteed
- The nature of the diving means that diving is likely to take place outside of normal working hours, experience has shown that work can take place from 4am up to 11pm, and the Historic England Marine Archaeologist with responsibility for the site may not be available at all times.

6.3.22 Immediately following recovery, a conversation will then take place between Historic England and MSDS Marine as to if they should be recorded further on the diving support vessel and returned to site or recovered to the conservation facility at Fort Cumberland for conservation by MSDS Marine conservator Heather Stewart.

6.3.23 All recoveries will be made within the limits of the Marine and Coastal Access Act (2009). During the course of the project this will require all recoveries to be made by hand. All finds will be reported to the Receiver of Wreck as required under the Merchant Shipping Act (1995).

6.3.24 If finds are to be returned to the site, they will be recorded on the dive vessel with a photograph with a scale and returned to the site on the next dive.

6.3.25 If finds are to be kept, they will be assigned an identifier unique to the site and the project. Initial conservation will follow the guidance detailed in First Aid for Underwater Finds[14] and guidance from the Historic England and MSDS Marine conservators. MSDS Marine were the archaeological diving contractors for the excavation of the *London* wreck over the course of three years and the project managers for the *Rooswijk* excavation which took place over a period on site of five months over two years. As such, our team have a great deal of direct

[14] Robinson, R. 1998 *First Aid for Underwater Finds,* Archetype Publications

experience in the recording, recovery, processing, storage and conservation of finds of all sizes: The *Rooswijk* alone has resulted in over 2000 finds.

6.3.26 MSDS Marine have a stock of packaging material but Historic England have also kindly indicated that boxes and bags can be made available through Angela Middleton. MSDS Marine will liaise closely with Angela prior to fieldwork to ensure suitable packaging is in place.

6.3.27 Once material is at Fort Cumberland Angela Middleton will liaise with Historic England specialists to undertake a brief assessment of the material. Specialists will be asked to confirm material and date of recovered artefacts.

6.3.28 Following this assessment conservation will commence. The conservation required will depend on the nature of any artefacts recovered and will be agreed with the Historic England conservator before any treatment commences. It is assumed that most conservation processes will follow the processes in place for material from the *Rooswijk.*

6.3.29 The conservation of marine finds is complex and can take a lengthy period to complete due to the need for desalination prior to further conservation work. The conservation will be completed by the end of the project timetable where possible. Where items are more complex conservation will continue beyond the life of the project.

6.3.30 Southend Museum will be the ultimate repository for all recovered finds post conservation.

6.3.31 Should the conservation time not be required then the five days' time will be held in hand to complete the conservation of items from the wreck site in future or the project can be varied down at the request of Historic England.

6.4 Stage 4c - Creating a digital site plan and training

6.4.1 Following fieldwork an intensive three-day training programme and post-fieldwork recording session will be held at the MSDS Marine office in Holbrook, Derbyshire. The purpose of this is two-fold. Firstly, all of the diver tracking data collected during fieldwork, and the Multibeam collected in November 2019, will be processed and digitised into a Site Recorder project. In addition, the team of affiliated volunteers will be provided with training in digitisation and provided with the skills to maintain the system in future as the site changes and more is uncovered and discovered.

6.4.2 During this process the existing site plan created by Steven Ellis will be digitised using an iPad and stylus and uploaded into Site Recorder. It is proposed that two members of the licensed team will be involved in the training to ensure that an appropriate number of the team have the skills required. Discussions with the team have suggested that Steven Ellis and Carol Ellis will attend the training. Should other team members like to attend then provision will be made for this but the project will be unable to back fill their day jobs through payment.

6.4.3 At the end of the three days all digitised data will be handed to the Licensee in a useable format. Three days' additional support and training, that will be provided as required, in Southend on Sea are built into the project to ensure the knowledge learned during the training is fully embedded and supported.

6.4.4 MSDS Marine recognise the current uncertainty caused by Covid-19 and have identified risks to the project from it in the Risk Log (see Annex A). We have a Zoom Professional subscription that would allow the training to take place remotely using Zoom Webinar or Zoom Meeting should Covid-19 restrictions continue. Additionally, we have full Microsoft subscriptions for all employees that allow access to shared working platforms such as Microsoft Teams and Microsoft Forms. However, it is the preference of all team members that training takes place in person.

6.5 Stage 4d - Dissemination and completion

6.5.1 A report presenting results and evaluating the project will be created at the conclusion of the project. It will include an analysis of the project methodology and its effectiveness together with the results of stages 4a - 4c.

6.5.2 To facilitate more widespread dissemination of the project, two articles will be created for publication; one for Historic England's Research News and one for the International Journal of Nautical Archaeology.

6.5.3 At project completion the project archive will be submitted to the Archaeological Data Service and an OASIS report will be completed.

6.6 Scope

6.6.1 This project will only focus on the designated areas of the *London* protected wreck site[15].

[15] https://historicengland.org.uk/listing/the-list/list-entry/1000088, accessed 5th November 2019.

7.0 Assessing Impact

7.0.1 It is important that all projects commissioned by Historic England make an impact. The 2017 report Delivering better outcomes for citizens: practical steps for unlocking public value[16] recognised the importance of measuring and improving public sector productivity - doing more with less – and one way of ensuring improved public value it to assess the impact of a project. The report, led by Sir Michael Barber, recommended that for every major area of public expenditure it should be customary that good data is gathered and analysed in a timely manner to allow informed decisions to be made by those responsible for blocks of expenditure. MSDS Marine will ensure that good data is gathered and analysed to assess impact as part of this project. This evaluation will be comprehensive but proportionate.

7.0.2 Impact assessment is a means of measuring the effectiveness of activities and projects and judging the significance of the changes or benefits brought about by these actions. Impact can be gauged in terms of reach (e.g. how many people/organisations were influenced by the work) and significance (e.g. the difference it made to these people/organisations).

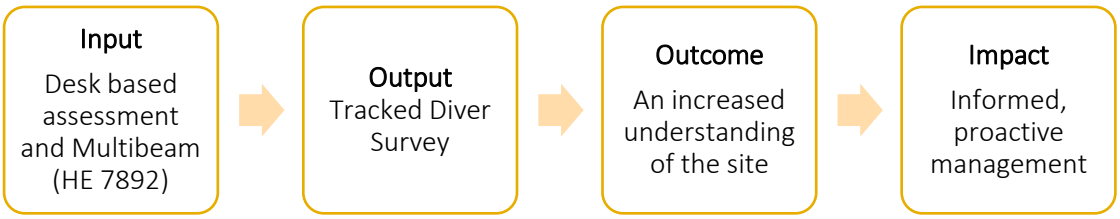
7.0.3 Here, 'impact' is defined as the broad or longer-term effects of this project. This can include effects on people who are direct users of a project or Historic England's work, effects on those who are not direct users, or effects on a wider field such as heritage policy. Gathering, assessing and presenting evidence of impact is therefore part of this project under the following three broad headings: Individuals & Communities; Organisations; Practice & Policy.

7.1 Our Approach to Assessing Impact

7.1.1 MSDS Marine will assess the impact of the project to ensure we are making a real difference and so that we are in the best possible position to show that we offer excellent public value.

7.1.2 Impact evaluation will be undertaken using both quantitative and qualitative methods, as appropriate, in order to map out links across different levels of change, from input to impact.

7.1.3 For this project this may look like this:



[16] *Delivering better outcomes for citizens: practical steps for unlocking public value* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/660408/PU2105_Delivering_better_outcomes_for_citizens_practical_steps_for_unlocking_public_value_web.pdf, accessed 1st November 2019.

7.1.4 Significance will be assessed by case study. Should it become apparent that the project has had a significant impact upon an individual, organisation, or practice and policy during the life cycle of the project, this will be reported on in case-study form in the end of project report.

Individuals and Communities

7.1.5 Impact in terms of 'reach' will be assessed through use of social media statistics relating to the contact points set out in the Communications and Engagement Plan, the total number of volunteers engaged with the project, and the total number of enquiries we receive relating to the project. At the end of the project, we will gather and present data on the number of likes, retweets, shares, and views posts relating to the project have received. This evidence is likely to be available within the time frame of the project as, although these numbers would likely increase over time, the flurry of social media activity tends to be found soon after the initial post is made hence results would be apparent quickly. These statistics form a quantitative method of evaluating the reach of the work and can be applied to understand reach to individuals and communities, as well as organisations.

7.1.6 Stakeholders will also be asked to feedback on their relationship with MSDS Marine during the lifetime of the project. This will enable MSDS Marine to continue to improve the way we work with stakeholders and help provide quality assurance on our work to Historic England.

7.1.7 Statistics and case studies demonstrating impact will be submitted in the form of a report, which will be submitted to Historic England. The report will analyse the reach of the project and the significance of the impact. The kinds of outcomes/impact which might be recognised include:

- The reach on social media
- The number of volunteers/community groups and organisations who participated in the project
- The number of days training provided in the course of the project
- The impact on stakeholders during the project
- The significance of any impact

Organisations

7.1.8 As with communities and individuals, reach in terms of organisations will also be evaluated by analysis of social media statistics, with a view to ascertaining how many organisations responded to the posts. This will involve analysis of which organisations shared, liked and retweeted the posts.

7.1.9 Additionally, at the end of the project Historic England will also be provided with a list of all organisations 'reached' directly via contact during the project. These may include Museums, Government Agencies, Charitable Trusts etc.

Practice and Policy

7.1.10 The contribution of this project to practice and policy will be constantly evaluated during the course of the project. Opportunities will be identified for the Project Manager to share best practice identified in the course of the project with the wider archaeological community through papers given at conferences and workshops, subject to Historic England agreement.

8.0 Products, Communication, Engagement and Archiving

8.1 Products

8.1.1 In addition to the products already detailed in this Tender document, two articles will be produced to facilitate more widespread dissemination. The articles are proposed for Historic England's Research News and the International Journal of Nautical Archaeology.

No	Product	Stage
1	Communications Plan	4a
2	Highlight Reports	4a – 4c
3	Tracked diver survey	4b
4	Conservation of recovered finds	4b
5	A digital site plan	4c
6	Training	4c
7	Training support	4c
8	Final Report	4d
9	Two articles for publication (one for Research News and one for the International Journal of Nautical Archaeology)	4d
10	OASIS submission	4d
11	Archive submission	4d

Table 3: Products

9.0 Stages and Tasks

9.0.1 The following named individuals are identified within the stages below and associated task lists:

Initial	Name	Role
AJ	Alison James	Project Manager
AM	Angela Middleton	Historic England Senior Conservator
CE	Carol Ellis	Licensed Team Member
HM	Hefin Meara	Historic England Marine Archaeologist
HS	Heather Stewart	Conservator
MBE	Mark Beattie Edwards	Nominated Archaeologist/ Dive Team Member
MJ	Mark James	Project Executive/ Diving Supervisor
MP	Michael Pitts	Dive Team Member
PH	Pete Holt	Surveyor
SE	Steven Ellis	Licensee/ Dive Team Member
SM	Steve Meddle	Licensed Team Member/ Dive Team Member
TH	Tom Harrison	Senior Project Officer/ Dive Team Member

Table 4: Initials, Names and Roles

9.1 Stages and Tasks

9.1.1 The following tasks and stages have been identified in relation to the project:

Task	Task Details	Person Responsible	Number of Days	Product
Stage 4a: Project Initiation				
1	Project Management and Co-ordination	AJ	0.5	
2	Project Initiation Meeting (Telephone)	AJ	0.2	
		HM	0.2	
		SE	0.2	
		MBE	0.2	
		MJ	0.2	
3	Finalise communication plan	AN	1	1
4	Stakeholder liaison	AJ	1	
5	Apply for licences and permissions	AJ	0.5	3
6	Book vessel, accommodation and co-ordinate fieldwork arrangements	AJ	0.5	3
7	Quality Assurance	MJ	0.25	
Stage 4b: Tracked Diver Survey				
1	Project Management and Co-ordination	AJ	0.5	
8	Diving fieldwork preparation	TH	2	3
		MJ	1	3

9	Mobilisation of diving equipment, vessel and tracking system	TH	1	3
		MJ	1	
		PH	2	
10	Five days tracked diver survey	MJ	5	3
		TH	5	3
		MBE	5	3
		SE	5	3
		SM	5	3
		MP	5	3
11	Demobilisation	TH	1	3
		MJ	1	3
12	Co-ordination of Historic England Specialists assessment of recovered material	AM	1	3
13	Conservation of finds	HS	5	4
14	Highlight Report	AJ	1	2
7	Quality Assurance	MJ	0.25	
Stage 4c: Creating a Digital Site Plan and Training				
1	Project Management and Co-ordination	AJ	0.5	
15	Preparation for training	TH	1	6
		AJ	1	
16	Training delivery and site plan creation	TH	3	6, 7
		SE	3	
		CE	3	
17	Site plan creation ongoing support	TH	3	7
7	Quality Assurance	MJ	0.25	
Stage 4c: Creating a Digital Site Plan and Training				
1	Project Management and Co-ordination	AJ	0.5	
18	Production of final project report	MJ	2	8
		TH	1	
19	Production of two articles for publication	AJ	3	9
		MBE	1	
		TH	2	
20	Submission to ADS and OASIS	AJ	0.25	10, 11
7	Quality Assurance	MJ	0.25	

Table 5: Stages and Tasks

10.0 Ownership and Copyright

10.1 Material Produced Under the Contract

10.1.1 As detailed within the tender brief, all hard copy and digital documentation produced under the contract will be the copyright of Historic England. Copyright on all reports submitted will reside with Historic England, however, a third-party in-perpetuity licence will automatically be given for reproduction of the works by the originator, subject to agreement in writing from Historic England.

10.2 Material Originating from External Sources

10.2.1 Wherever external images or material are obtained for reports or for the purposes of dissemination appropriate copyright permissions will be obtained. It is noted that reports may be reproduced online and copyright permissions for this purpose will be obtained. Where restrictions may apply Historic England will be made aware of these and alternatives suggested.

10.2.2 Where material and information are obtained from external sources, be this written, photographic, data or verbal sources, this will be fully acknowledged and where appropriate permissions for reproduction obtained.

10.3 Document Protection

10.3.1 Measures will be taken to limit the possibility of extraction of content, including Ordnance Survey (OS) and UKHO data, from documents intended for dissemination via the internet. This can include flattening the document, applying password security, the application of watermarks, and reducing the resolution of images to a suitable level for display on a screen but too low for meaningful reproduction.

10.4 Confidentiality

10.4.1 MSDS Marine understand that certain elements of all projects may be considered sensitive and not for public dissemination. Prior to the undertaking of any works we will seek to establish any sensitivities with Historic England. Details of the project will not be made public without prior consent.

10.4.2 Where there may be a need to discuss sensitive elements of the project outside of the organisation, e.g. for obtaining additional data, this will be discussed and agreed with Historic England in advance.

11.0 Project Team

11.1 Historic England

11.1.1 The project will be directly managed and administrated by Historic England. Historic England Project Assurance and routine monitoring of standards and progress will be undertaken by an HPC Project Assurance Officer.

11.1.2 The MSDS Marine Project Manager, Alison James, will be responsible for liaison with the Historic England Project Assurance Officer and expected to produce highlight reports and maintain communication with Historic England.

11.2 Licensed Team

11.2.1 Steven Ellis is the Licensee for the *London* and leads the team of Historic England Affiliated Volunteers on site. Mark Beattie-Edwards is the Nominated Archaeologist and works closely with Steven and his team. Steve Meddle and Carol Ellis are key members of the affiliated volunteer team. As Steven, Mark, Carol and Steve are integral to the project their contribution is highly important and they have been included within the project at all stages as key stakeholders. To recognise this, and to allow them to provide cover in their day jobs, they are paid members of the team for this project. This also ensures minimal risk to the project as it ensures they are able to allocate the required time to the project.

11.3 MSDS Marine

11.3.1 MSDS Marine Ltd (MSDS Marine) are a marine and coastal archaeological contractor specialising in the management and support of archaeological projects. MSDS Marine offer a full range of archaeological services including, but not limited to consultancy, research, desk-based services, remote sensing, conservation, ground-truthing, and diving services.

11.3.2 Our team includes individuals with specialisms in remote sensing, diving, historic vessels, heritage management, historic and archival research, assessments and management of significance, surveying, conservation, and stakeholder engagement. As such, MSDS Marine are ideally placed to undertake the work set out in this Project Proposal. MSDS Marine and our team have extensive experience of working on the *London.*

Specific Team Experience on the *London*

11.3.3 MSDS Marine and our team have extensive experience working on projects relating to the *London.* Project Manager, Alison James, has ten years' experience working for Historic England where she recruited the affiliated volunteers who are now instrumental in the management of the site. Alison was responsible for developing, and contributing to, several projects, with external contractors, on behalf of Historic England that have contributed to the management of the site, notably:

- Historic England Project 7374 – Interpretation for divers on the *London* (Cotswold Archaeology)

- Historic England Project 6400 – Managing change on wreck sites through community-based recording: The *London* recording project (Wessex Archaeology)
- Historic England Project 6784 – Supporting community-based recording: The *London* recording project (Wessex Archaeology)
- Historic England Project 6901 – *London* Protected Wreck, Site, Thames Estuary: Excavation of Material at Risk (Cotswold Archaeology)

11.3.4 Project Executive and Diving Supervisor, Mark James managed all fieldwork operations, including archaeological diving and remote sensing, for the Cotswold Archaeology work on site from 2014 – 2016 funded by Historic England. In addition, Mark undertook the sub-bottom profiling funded by Southend-on-Sea Borough Council in 2016. MSDS Marine Senior Project Manager, Sally Evans, was the Cotswold Archaeology Project Manager responsible for the Historic England funded Project from 2014 – 2016. Sally and Mark were heavily involved in producing the virtual trail for the *London* in 2017.

11.3.5 Alison, Mark and Sally have all contributed extensively to various iterations of the *London* Conservation Statement & Management Plan with Sally producing the most recent version whilst at Cotswold Archaeology. Sally joined the MSDS Marine team in June 2017.

11.3.6 MSDS Marine can further demonstrate experience and competence within the industry through recent and current projects including the geophysical and hydrographic survey and interpretation of a large number of wrecks designated under the Protection of Wrecks Act 1973; the production of Virtual Trails for three designated wrecks and most notably the appointment as Project Managers for the archaeological excavation of the wreck of the *Rooswijk* sunk on the Goodwin Sands in 1740. The *Rooswijk* excavation is a collaboration of an international team of maritime archaeologists and specialists to survey, excavate, record, and conserve the wreck and excavated finds. The project is primarily funded by the Dutch Government's Cultural Heritage Agency, with Historic England as a project partner, and has been on-going since 2016.

11.3.7 MSDS Marine's approach to contract management is to ensure that the most appropriate members of staff are assigned to the project from start to finish. This approach ensures the consistency of all deliverables and an informed view of the project as a whole to ensure that any advice given takes into consideration all available information and includes previous, current and future works.

11.3.8 The Project Executive will be Mark James. Mark is one of the Directors of MSDS Marine, a full time, permanent member of staff and based at the companies registered address. Mark has been managing large scale marine archaeological projects and fieldwork for the last ten years, including the management of the New Forest National Park Authority Coastal Heritage Project and large-scale offshore development works and the excavation of the *Rooswijk* and *London* designated wreck sites. Mark's experience and technical expertise is wide-ranging allowing for the effective fulfilment of the Project Executive role and the effective delegation of works to the Project Manager. Mark provides quality assurance for the project.

11.3.9 The project will be managed by Alison James, one of the Directors of MSDS Marine. Alison is a full time, permanent member of staff based at the companies registered address. Alison has

extensive experience in project management, and extensive knowledge of the site through her previous role at Historic England. Alison will be the point of contact between Historic England and MSDS Marine.

11.3.10 Sally Evans is a Senior Project Manager at MSDS Marine. Sally has extensive experience of work relating to the *London* through her previous role at Cotswold Archaeology and work updating the *London* Conservation Statement and Management Plan. Sally will not directly be involved in the project but is able to provide support and cover both Alison and Marks roles if required.

11.3.11 Alison, Mark and Sally can each fulfil each other's roles in the event of illness or a change in circumstances and all will be kept updated with the project progress. The proposed teams experience is further outlined below.

Mark James, MCIfA - Project Executive

Key Skills:

- Large scale project management
- Quality assurance
- SCUBA and SSDE Operations
- Geophysical data collection and processing

11.3.12 Mark is a qualified and experienced marine archaeologist with particular expertise in archaeological geophysics and survey, the archaeological interpretation of data, the archaeological support of infrastructure projects and the project management of large-scale fieldwork. Mark has extensive experience in data collection, data processing, and data interpretation and has previously worked for the archaeological regulator, English Heritage (now Historic England), both in the Marine Designation and Marine Planning Departments prior to forming MSDS Marine. This combination of experience culminates in an informed and proactive approach to historic environment contract management.

11.3.13 Mark has project managed a number of large-scale archaeological projects on behalf of MSDS Marine including the recent international multi-agency excavation and preservation of the *Rooswijk* project and continues to provide project management through the conservation work MSDS Marine are undertaking on the finds and structure recovered.

Alison James, MCIfA – Project Manager

Key Skills:

- Project management
- Social media and communications
- Stakeholder engagement and volunteer management
- Heritage management

11.3.14 Alison James will be the Project Manager for this contract. Alison joined MSDS Marine in June 2018 having formerly been a Maritime Archaeologist at Historic England within the Listing Group. During her time at Historic England Alison gained extensive Project Management

experience, managing high profile projects such as the *London* and *Rooswijk* on behalf of Historic England and acting as a Project Assurance Officer for several Historic England funded organisations. Alison has also written and contributed to a number of Conservation Statements and Management Plans for England's Protected Wreck Sites including the *Amsterdam, Rooswijk* and *London.*

11.3.15 At Historic England Alison managed the Protected Wreck Affiliated Volunteers, the largest number of volunteers within the organisation. Alison has an established, and successful, working relationship with the affiliated volunteer team working on the *London*. Alison has extensive experience of working with stakeholder groups at all levels ranging from community groups to Government departments. She provides advice, guidance, and encouragement to them as well as ensuring they are working in line with best practice.

11.3.16 Alison has extensive experience of heritage legislation, the processes used to protect marine heritage assets in England and the *London* wreck site itself. This background makes her extremely well placed to manage this project.

Tom Harrison – Senior Project Officer

Key Skills:

- Dive team member
- UXO identification and research
- Historic shipwrecks
- Technical drawing and computer aided design

11.3.17 Tom holds HSE SCUBA and HSE SSDE (with offshore top up) qualifications. In addition, Tom is an SSI Advanced Open Water SCUBA Instructor and PADI Open Water SCUBA Instructor. Tom is a qualified Kirby Morgan, OTS and Apex Service Technician. Tom is also a certified technician with the Association of SCUBA Service Engineers and Technicians (A.S.S.E.T) certified to work on all SCUBA equipment, compressors and compressed air systems.

11.3.18 Tom has extensive experience in site plan digitisation and computer aided design as well as creating Site Recorder systems. This experience was most recently used on the *Rooswijk* excavation.

Heather Stewart – Conservator

Key Skills:

- Conservation
- Marine metals
- Waterlogged wood
- Finds assessment

11.3.19 Heather Stewart is a conservator specialising in historic vessels and wreck material. Heather is joined MSDS Marine as the Project Conservator for the *Rooswijk* excavation in February 2020 and is responsible for the assessment, conservation, and monitoring of the excavated material

from *Rooswijk* as well as other material through other MSDS Marine projects notably the bell of the USS *Osprey* on behalf of the US Embassy and a WWII flag found on a development control project.

11.3.20 The *Rooswijk* material includes waterlogged timbers from the ship's structure as well as an assemblage of over two thousand inorganic and organic small finds

Pete Holt – Surveyor

Key Skills:

- Surveying
- Geophysics
- Data management
- Diver tracking

11.3.21 Peter Holt spent 20 years with Sonardyne International Ltd. designing subsea navigation systems for the oil industry and military. Between 2010 and 2016 Peter directed the SHIPS Project, a wide ranging study of the maritime history of Plymouth funded by the US research foundation ProMare. Since 1989 Peter has worked on maritime archaeology projects all over the world in all depths from the foreshore down to 1,200m. He has written a number of papers on surveying, geophysics and data management and has written a number of books. Peter was a visiting research fellow at Plymouth University from 2010 to 2016, supervising numerous MSc Hydrography projects each year. Peter is a Chartered Engineer, a Member of the Chartered Institute for Archaeologists, a Member of the Hydrographic Society, a NAS Senior Tutor, he is the NAS south-west regional co-ordinator and is on the International Shipwreck Conference organising committee.

11.3.22 Peter has extensive experience in diver tracking technology and is recognised as a leader in the field. As such, Peter is included on the team to provide quality assurance to all parties in setting up the diver tracking.

Michael Pitts – Diver and Cameraman

Key Skills:

- **Emmy award winning cameraman**
- **Extensive experience working on protected wreck sites**
- **Filming in low visibility environments**
- **Dive Team Member**

11.3.23 Michael Pitts is an award-winning cameraman with extensive experience working with MSDS Marine, notably on the *Rooswijk* excavation as well as on the development of the Thorness Bay dive trail. Michael is a qualified HSE SCUBA and SSDE diver and will be embedded within the core MSDS Marine dive team in order to ensure high quality video footage is collected to increase knowledge of the site and to enable increased public presentation of the site.

Steven Ellis - Licensee

Key Skills:

- ***London* site knowledge**
- **Local area knowledge**
- **A key stakeholder**
- **Dive Team Member**

11.3.24 Steven is the Licensee for the *London* and lead a team of Historic England Affiliated Volunteers on the site. His understanding of the site has been gained through many dives on the site since and he has been integral to all work on the site since becoming involved as Licensee.

11.3.25 Steven was a member of the dive team that excavated the *London* between 2014 and 2016. Steven joins the Project Team to offer his knowledge of the site.

Mark Beattie-Edwards – Nominated Archaeologist

Key Skills:

- ***London* site knowledge**
- **A key stakeholder**
- **Dive Team Member**

11.3.26 Mark is the Nominated Archaeologist for the *London* and works closely with Steven and his team of Historic England Affiliated Volunteers on the site. Mark is also Chief Executive Officer of the Nautical Archaeology Society and an experienced maritime archaeologist.

11.3.27 Mark was a member of the dive team that excavated the *London* between 2014 and 2016. Mark joins the Project Team to offer his knowledge of the site and to join the dive team.

Steve Meddle – Licensed Team Member

Key Skills:

- ***London* site knowledge**
- **Local area knowledge**
- **A key stakeholder**
- **Dive Team Member**

11.3.28 Steve is a key member of the *London* licenced team and a Historic England Affiliated Volunteer. His understanding of the site has been gained through many dives on the site since and he has been integral to all work on the site since becoming involved at the same time as Steve Ellis.

11.3.29 Steve was a member of the dive team that excavated the *London* between 2014 and 2016. Steve joins the Project Team to offer his knowledge of the site.

Carol Ellis – Licensed Team Member

Key Skills:

- ***London* site knowledge**
- **Local area knowledge**
- **A key stakeholder**
- **Volunteer Team Member**

11.3.30 Carol is a key member of the *London* licenced team and a Historic England Affiliated Volunteer. Her understanding of the site has been gained through many dives on the site since and she has been integral to all work on the site since the volunteer team began work. Carol is currently unable to dive on the site but is active in dive planning and post-dive recording work.

11.3.31 Carol was a member of the dive team that excavated the *London* between 2014 and 2016. Carol joins the Project Team to offer her knowledge of the site and to contribute to the ongoing recording post diving.

12.0 Communications, Review and Evaluation

12.0.1 The project will be undertaken by MSDS Marine with members of the Licensed Team, including the Nominated Archaeologist, embedded within the core team. For the purposes of this project they are considered an internal member of the MSDS Marine team and all procedures outlined in this section apply.

12.1 Internal Communications

12.1.1 The project team have well-established internal systems for communication which includes a mixture of face to face meetings, phone calls and email. As a large number of the team are homeworkers, MSDS Marine holds quarterly team meetings at our main office to ensure face-to-face relationships are maintained. The team has extensive experience of working together on similar projects and these forms of communication have been effective.

12.1.2 MSDS Marine operate and maintain a line management system that allows for weekly update meetings and regular review of workload between project managers and project officers. This ensures issues to the project are identified at an early stage and that systems can be put in place to address any issues before they cause a risk to the project.

12.1.3 A PDR system, including clear job plans and personal development plans, for all employees ensures that all team members are clear on what is required of them at all times as well as identifying opportunities for continuing professional development.

12.2 External Communications

12.2.1 Ongoing communication with Historic England will be via email and phone call, and through face to face meetings as required. Prior to the commencement of any dissemination a communications plan will be developed and agreed with Historic England and all members of the project team. The communications plan will ensure a streamlined and consistent message will be disseminated.

12.3 Review

12.3.1 During the project, the Project Manager will encourage a culture of ongoing critical review or results against the Projects original aims and objectives. The review process will take the form suggested in MoRPHE of Act, Report, Plan, Decide, Act as this flexible approach is consistent with the unpredictable nature of marine historic environment research. This will operate both formally, at each stage, and more informally on an ongoing basis within the Project Team.

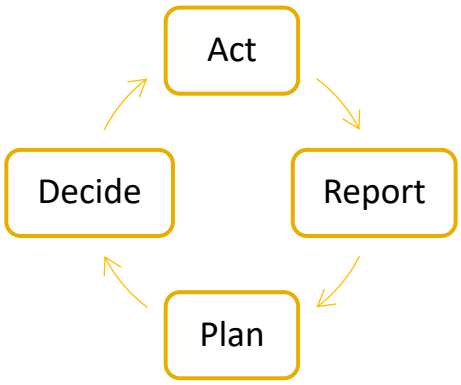


Table 6: Cycle of continuous review as suggested in the MoRPHE Project Managers Guide.

12.4 Risk Log

12.4.1 The Project Manager will maintain the risk log, given in Annex A, throughout the course of the project. It will be checked when reviewing progress to assess whether the likelihood of any risk has changed and whether any anticipated risks are occurring. An up-to-date risk log will be submitted with highlight reports.

12.5 Issues Log

12.5.1 Once the project is commissioned an issues log will be created and maintained by MSDS Marine. It will provide a record, in a single document, of all unseen events, results and discoveries, discussion or review outcomes and other Issues that might otherwise be dispersed within other project documents. It will be updated by the Project Manager whenever an issue is raised and again when the issue is resolved. An example issues log is given in Annex B.

12.6 Highlight Report and Review Points

12.6.1 The end of each project stage will form a review point which, where indicated in the task list, will result in a Highlight Report being produced and submitted to Historic England.

12.6.2 It will also result in a telephone meeting with Historic England and other stakeholders as deemed appropriate. Highlight Reports will follow the format set out for Highlight Reports in the MoRPHE Project Managers Guide.

12.6.3 Headings will include, but are not limited to:

- Project Name and Number
- Author
- Date
- Circulated to
- Period Covered
- General Progress
- Timetable
- Budget
- Resources
- Product and Tasks completed during the period
- Products and Tasks to be completed during the next period

- Project Risks
- An up to date report by task against the task list

12.6.4 Any issues will be reported to Historic England in a timely manner.

12.7 Internal Quality Assurance

12.7.1 The Project Executive, Mark James is a Member of the Chartered Institute for Archaeologists (MCIfA). The Project Manager, Alison James, is a Member of Chartered Institute for Archaeologists (MCIfA).

12.7.2 MSDS Marine Ltd endorses the various Codes of Conduct and Practice of CIfA.

12.7.3 MSDS Marine are an ISO 9001 : 2015 Quality management systems accredited organisation and operate and maintain a ISO 9001 : 2015 quality management system. MSDS Marine are a CIfA Registered Organisation and a member of the Association of Diving Contractors.

12.7.4 Where applicable to the project, and the works undertaken, MSDS Marine will comply with all requirements set forth by Historic England. Quality Assurance is the responsibility of the Project Executive.

12.7.5 The Project Manager will ensure the delivery of the project to the agreed specification, on time and to budget. Upon approval of the Project Design a project Issues Log will be created, and the Project Manager will maintain this during the course of the project. The Project Executive is responsible for Quality Assurance.

12.8 External Quality Assurance

12.8.1 External contractors will be expected to comply by MSDS Marines internal quality assurance systems. Where external contractors are used, they will always work under the direct supervision of an MSDS Marine team member.

12.9 Evaluation

12.9.1 An end of Project Report will set out highlights, challenges, and recommendations which might help MSDS Marine or Historic England when planning future projects

12.9.2 The end of Project Report will include an impact assessment of the project as set out in Section 7.

13.0 Health and Safety

13.0.1 The MSDS Marine certified ISO 45001 : 2018 Occupational Health and Safety Management System fulfils our objectives of maintaining the excellent record of MSDS Marine in relation to health and safety and to ensure all our legal requirements as an employer are met.

13.0.2 MSDS Marine have an exemplary safety record with no reportable injuries or incidents and a Lost Time Injury Frequency Rate of zero since the inception of the company. Although thousands of hours have been spent at sea and hundreds of dives have been undertaken, our knowledge of the environment and regulations, and our approach to Health and Safety ensures our offshore safety record remains unsurpassed.

13.0.3 Our safety record also extends to all other areas our work covers, including in the intertidal zone, terrestrially and during desk-based activities. Our pride in our safety record and the welfare of our employees drives our approach to Occupational Health and Safety and is guided by the policies detailed within this section.

13.0.4 MSDS Marine has a zero-tolerance policy for any form of modern slavery, coerced labour or human trafficking, both within its own business and within its supply chain.

13.0.5 Our full Health and Safety Policy is given in Annex C.

13.0.6 A Diving Project Plan has been created for the project to fulfil obligations under the Diving at Work Regulations 1997. This is given in full in Annex G. Please note that this document pertains only to the diving elements of the project and will be reviewed and updated prior to the commencement of fieldwork.

13.0.7 Given the global Covid-19 pandemic, MSDS Marine have reviewed all operations to ensure we remain Covid-19 compliant both in our offices and when on fieldwork. Small changes have been put in place, for example increased cleaning routines and the provision of hand sanitiser on every desk and in communal areas, that allow us to maintain a Covid-19 secure workplace. At present, all staff are working at home as directed by the UK Government. Our existing systems to enable homeworking have allowed this to happen with no additional infrastructure required. As soon as we are able to get the team back in the office we will do so.

13.0.8 We are hopeful that the development of a vaccine and the warmer spring weather will allow fieldwork to commence in the timescales indicated in this Tender document. We are however mindful that Covid-19 secure practices will need to be followed for the foreseeable future. To this end, pre fieldwork risk assessments will identify the changes that need to be put into place with our regular practices to ensure we remain compliant. Simple changes like providing hand sanitiser and not allowing visitors to the boat will help lower risk but these will be considered closer to the time as the situation is rapidly evolving. All guidance issued by Historic England, the Chartered Institute for Archaeologists, FAME and the Association of Diving Contractors will be followed, alongside that issued directly from Government.

15.0 Timescale

15.0.1 Key project dates are as follows:

Stage	Commencement Date	Completion Date
Stage 4a Project Initiation	February 2021	March 2021
Stage 4b: Tracked Diver Survey	March 2021	June 2021
Stage 4c: Creating a Digital Site Plan and Training	June 2021	August 2021
Stage 4d: Dissemination and Completion	August 2021	October 2021

Table 7: Estimated Timescale

15.0.2 The below chart is an indicative timetable for the completion of the main tasks within each stage based on the project starting in February 2021.

	February	March	April	May	June	July	August	September	October
Project Management and Co-ordination									
Quality Assurance									
Stage 4a: Project Initiation									
Project Initiation Meeting									
Produce communications plan									
Stakeholder liaison									
Apply for licences and permissions									
Book vessel, accommodation and co-ordinate fieldwork arrangements									
Stage 4b: Tracked Diver Survey									
Diving Fieldwork preparation									
Mobilisation									
Tracked Diver Survey									
Demobilisation									
Assessment of recovered material									
Conservation of recovered material									
Highlight Report									
Stage 4c: Creating a Digital Site Plan and Training									
Preparation for training									
Training delivery and site plan creation									
Site plan creation ongoing support									
Stage 4d: Dissemination and Completion									
Production of final project report									
Production of two articles for publication									
Submission to ADS and OASIS									

Table 8: Stages and Dates

Annex A - Risk Log

Risk Number	Description	Probability	Impact	Counter measures	Estimated/ Time cost	Owner	Date this entry last updated
1	Illness of Project Team Members	Low	Low	Alison James, Mark James and Sally Evans can all fulfil the role of Project Manager. The large size of the wider MSDS Marine team, both internal and external, that ensures time will not be lost due to illness.	Nil	Project Manager	25/11/2020
2	Loss of data through IT failure	Low	High	The project Data Management Plan, see Annex G, fully identifies how data will be dealt with in the course of the project. Data will be stored on the MSDS Marine server during the life of the project. This server is set to auto back up using a RAID system and also backs up nightly to a commercial Microsoft remote backup centre.	Nil	Project Manager	25/11/2020
3	Conservation process takes longer than anticipated	Medium	Medium	Monthly meetings following fieldwork to review between MSDS Marine and HE.	Negligible	Alison James, Angela Middleton	25/11/2020
4	A third Covid-19 lockdown makes lab access impossible	Medium	Medium	The MSDS Marine conservator is based at Fort Cumberland. HE will MSDS Marine immediately if lab access is further restricted. There is no fixed timescale for the conservation of material as there is no publication etc that will be impacted.	High	Alison James, Angela Middleton	25/11/2020

5	Covid-19 global pandemic secure working measures reduces productivity	High	High	The whole team are aware of the challenges of Covid-19 working and will work together to co-ordinate plans to minimise disruption. Covid-19 productivity is a standing item on the monthly team management meeting agenda at MSDS Marine.	Negligible	Alison James,	25/11/2020
6	Covid-19 global pandemic secure delays fieldwork	High	High	MSDS Marine have systems in place to enable Covid-19 secure fieldwork to take place but all Government restrictions and regulations will be adhered to.	Negligible	Alison James	25/11/2020
7	Dive Team members unfamiliar with equipment	Low	Medium	MSDS Marine have selected a team who have dived as part of the MSDS Marine dive team before. All divers will be given a re-familiarisation with equipment prior to diving commencing.	Negligible	Project Manager	25/11/2020
8	Adverse weather results in cancellation of diving sessions	Medium	Low	MSDS Marine maintain a flexible approach to undertaking diving operations. Prior to mobilisation the weather will be assessed and the diving session rescheduled if required. All effort will be taken to determine suitable weather windows and ensure time is not lost.	TBC	Project Manager	25/11/2020
9	Visibility results in the dive team being unable to locate the site underwater	Medium	Low	The MSDS Marine dive team are used to working in low visibility environments, notably on the *London* and *Rooswijk.* Prior to fieldwork the Diving Supervisor will assess normal visibility for the area, as well as using current regional expert knowledge to ensure the team are prepared for likely conditions on the site. Use of acoustic diver tracking systems, and guidance from the surface will help to ensure low visibility will not affect work.	Negligible	Project Manager	25/11/2020

10	The Diving Support Vessel breaks down	Low	Low	MSDS Marine ensure that we charter well maintained vessels to reduce this risk.	Negligible	Project Manager	25/11/2020
11	Diving Support Vessel unable to effectively anchor on site	Low	Low	MSDS Marine have a strong track record of working with a number of external vessels that have suitable equipment and skills to ensure that anchor deployment is not an issue.	Negligible	Project Manager	25/11/2020
12	UXO identified by divers on the seabed	Low	Medium	MSDS Marine routinely works with UXO data in our commercial offshore renewables work. The team all have experience in identifying UXO material and are aware of the strict protocols in place when encountered. The Project Manager will ensure UXO is reported, and dealt with, swiftly to ensure minimal loss of time on site.	Negligible	Project Manager	25/11/2020
13	Equipment failure results in lack of productivity	Low	High	MSDS Marine hold a large pool of equipment with plenty of spares to ensure that equipment can be replaced at short notice. Additionally, our relationship with Go Dive Ltd ensures we have direct links to suppliers and can replace equipment normally on the same day. This all ensures that although equipment failure would have a high impact on the project the risk of it occurring is extremely low.	Nil	Project Manager	25/11/2020

Annex B – Issues Log

Issue Number	Description of the Issue	Raised by	Date raised	Resolution	Date entry last updated	Status	Priority

Annex C - Occupational Health & Safety, Equality & Diversity and Environmental Policies

1 Occupational Health and Safety (OH&S): Summary

1.1 The MSDS Marine certified ISO 45001 : 2018 Occupational Health and Safety Management System fulfils our objectives of maintaining the excellent record of MSDS Marine in relation to health and safety and to ensure all our legal requirements as an employer are met.

1.2 MSDS Marine have an exemplary safety record with no reportable injuries or incidents and a Lost Time Injury Frequency Rate of zero since the inception of the company. Although thousands of hours have been spent at sea and hundreds of dives have been undertaken, our knowledge of the environment and regulations, and our approach to Health and Safety ensures our offshore safety record remains unsurpassed.

1.3 Our safety record also extends to all other areas our work covers, including in the intertidal zone, terrestrially and during desk-based activities. Our pride in our safety record and the welfare of our employees drives our approach to Occupational Health and Safety and is guided by the policies detailed within this section.

1.4 MSDS Marine has a zero-tolerance policy for any form of modern slavery, coerced labour or human trafficking, both within its own business and within its supply chain.

2 Occupational Health and Safety (OH&S): Policy

Purpose of policy

MSDS Marine Ltd (the Employer) takes health and safety issues seriously and is committed to protecting the health and safety of its staff and all those affected by its business activities and attending its premises. This policy is intended to help the Employer achieve this by clarifying who is responsible for health and safety matters and what those responsibilities are.

This is a statement of policy only and does not form part of your contract of employment. This policy may be amended at any time by the Employer in its absolute discretion. The Employer will review this policy at regular intervals to ensure that it is achieving its aims effectively and to ensure a process of continuous improvement.

Objectives

To maintain the excellent record of MSDS Marine in relation to health and safety and to ensure all legal requirements as an employer are met.

Who is responsible for workplace health and safety?

Achieving a healthy and safe workplace is a collective task shared between the Employer and staff. This policy and the rules contained in it apply to all staff of the Employer, irrespective of seniority, tenure and working hours, including all employees, directors and officers, consultants and contractors, casual or agency staff, trainees, homeworkers and fixed-term staff and any volunteers. Specific responsibilities of staff are set out in the section headed "Responsibilities of all staff" below.

Employer responsibilities

The Employer is responsible for:

a) taking reasonable steps to safeguard the health and safety of staff, people affected by the Employer's business activities and of people visiting its premises;
b) identifying health and safety risks and finding ways to manage or overcome them;
c) providing a safe and healthy place of work and safe entry and exit arrangements, including during an emergency situation;
d) providing and maintaining safe working areas, equipment and systems and, where necessary, appropriate protective clothing;
e) providing safe arrangements for the use, handling, storage and transport of articles and substances;
f) providing adequate information, instruction, training and supervision to enable all staff to do their work safely, to avoid hazards and to contribute positively to their own health and safety at work. The Employer will give you the opportunity to ask questions and advise who best to contact in respect of those questions, if you are unsure about how to safely carry out your work;
g) ensuring any health and safety representatives receive appropriate training to carry out their functions effectively;
h) providing a health and safety induction and appropriate safety training to your role, including:

    - manual handling;

- electrical safety;
- the use of personal protective equipment (PPE);
- training will be given as relevant to employees job descriptions;
- promoting effective communication and consultation between the Employer and staff concerning health and safety matters and will consult with staff directly relating to health and safety;
- if an epidemic or pandemic alert is issued, providing instructions, arrangements and advice to staff as to the organisation of business operations and steps to be taken to minimise the risk of infection; and
- regularly monitoring and reviewing the management of health and safety at work, making any necessary changes and bringing those to the attention of all staff.

The board of directors of the Employer has overall responsibility for health and safety and has appointed the Archaeological Director as the Principal Health and Safety Officer with day-to-day responsibility for health and safety matters. MSDS Marine have a commitment to fulfil all legal and other requirements in the operation of our business.

Any concerns about health and safety matters should be notified to the Principal Health and Safety Officer.

Responsibilities of all staff:

1) General staff responsibilities

All staff must:

a) take reasonable care for their own health and safety and that of others who may be affected by their acts or omissions;

b) co-operate with the Principal Health and Safety Officer and the Employer generally to enable compliance with health and safety duties and requirements;

c) comply with any health and safety instructions and rules, including instructions on the safe use of equipment;

d) keep health and safety issues in the front of their minds and take personal responsibility for the health and safety implications of their own acts and omissions;

e) keep the workplace tidy and hazard-free;

f) report all health and safety concerns to the Principal Health and Safety Officer promptly, including any potential risk, hazard or malfunction of equipment, however minor or trivial it may seem; and

g) co-operate in the Employer's investigation of any incident or accident which either has led to injury or which could have led to injury, in the Employer's opinion

2) Staff responsibilities relating to equipment

All staff must:

a) use equipment as directed by any instructions given by representatives of management or contained in any written operating manual or instructions for use and any relevant training;
b) report any fault with, damage to or concern about any equipment (including health and safety equipment) or its use to the Director, who is responsible for maintenance and safety of equipment;
c) ensure that health and safety equipment is not interfered with; and
d) not attempt to repair equipment unless suitably trained and authorised.

3) Staff responsibilities relating to accidents and first aid

All staff must:

a) promptly report any accident at work involving personal injury, however trivial, to the Principal Health and Safety Officer so that details can be recorded in the Accident Book and cooperate in any associated investigation;
b) familiarise themselves with the details of first aid facilities and trained first aiders, which are displayed on the notice board in the toilet and available from the Principal Health and Safety Officer;
c) if an accident occurs, dial 07751877821 and ask for the duty first aider, giving name, location and brief details of the problem.
d) The Principal Health and Safety Officer is responsible for investigating any injuries or work-related disease, preparing and keeping accident records, and for submitting reports under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR), where required.

4) Staff responsibilities relating to national health alerts

All staff must:

a) If an epidemic or pandemic alert is issued, all staff must comply and co-operate with all instructions, arrangements and advice issued by the Employer as to the organisation of business operations and steps to be taken by staff to minimise the risk of infection. Any questions should be referred to the Principal Health and Safety Officer.

5) Staff responsibilities relating to emergency evacuation and fire

All staff must
a) familiarise themselves with the instructions about what to do if there is a fire which are available from the Principal Health and Safety Officer r;
b) ensure they are aware of the location of fire extinguishers; fire exits and alternative ways of leaving the building in an emergency;
c) comply with the instructions of fire wardens if there is a fire, suspected fire or fire alarm (or a practice drill for any of these scenarios);
d) co-operate in fire drills and take them seriously (ensuring that any visitors to the building do the same), fire drills will be held at least once every 12 months;
e) ensure that fire exits or fire notices or emergency exit signs are not obstructed or hidden at any time;
f) notify the Principal Health and Safety Officer immediately of any circumstances (for example, impaired mobility) which might hinder or delay evacuation in a fire. This will allow the Principal Health and Safety Officer to discuss a personal evacuation plan for you, which will be shared with the fire wardens and colleagues working near to you

g) On discovering a fire, all staff must:

a. immediately trigger the nearest fire alarm and, if time permits, call the Archaeological Director and notify the location of the fire; and

b. attempt to tackle the fire ONLY if they have been trained or otherwise feel competent to do so. Nominated members of staff will be trained in the use of fire extinguishers.

h) On hearing the fire alarm, all staff must:

a. remain calm and immediately evacuate the building, walking quickly without running, following any instructions of the fire wardens;

b. leave without stopping to collect personal belongings; and

c. remain out of the building until notified by a fire warden that it is safe to re-enter.

The Principal Health and Safety Officer is responsible for ensuring fire risk assessments take place and changes made where required, and for making sure there are regular checks of fire extinguishers, fire alarms, escape routes, signage and emergency lighting.

Risk assessments, display screen equipment and manual handling

Risk assessments are simply a careful examination of what in the workplace could cause harm to people. The Employer will assess any risks and consider measures to best minimise any risk. The Employer will carry out general workplace risk assessments when required or as reasonably requested by staff. Managers must ensure that any necessary risk assessments take place and the resulting recommendations are implemented. The Principal Health and Safety Officer is responsible for workplace risk assessments and any measures to control risks.

Personal Protective Equipment (PPE) is provided where risks cannot be otherwise effectively controlled.

Staff who use a computer for prolonged periods of time should try, where possible to organise short breaks every few hours away from the computer screen, but may request a workstation assessment and/or an eye test by an optician by contacting the Principal Health and Safety Officer. The Principal Health and Safety Officer will then provide you with more details and make arrangements if you would like to proceed. Guidance on the use of display screen equipment can also be obtained from the Principal Health and Safety Officer.

Guidance on manual handling (for example, lifting and carrying heavy objects) can be obtained from the Principal Health and Safety Officer and where necessary training will be provided by the Employer, but the Employer will try to minimise or avoid the need for manual handling where there is a risk of injury.

Non-compliance with health and safety rules

Any breach of health and safety rules or failure to comply with this policy will be taken very seriously and is likely to result in disciplinary action against the offender, in accordance with the Employer's disciplinary policy, up to and including immediate dismissal.

Date of Issue: 1st August 2018

Signed:
Date of Next Review: 1st August 2019
Print Name: Mark James

Date of Review: 1st August 2019

Signed:
Date of Next Review: 1st August 2021
Print Name: Mark James

3 Equality and Diversity Policy

MSDS Marine is committed to encouraging equality and diversity among our workforce, and eliminating unlawful discrimination.

The aim is for our workforce to be truly representative of all sections of society and our customers, and for each employee to feel respected and able to give their best.

MSDS Marine - in providing services and undertaking all aspects of our work - is also committed against unlawful discrimination of customers or the public

The policy's purpose is to:

- provide equality, fairness and respect for all in our employment, whether temporary, part-time or full-time. The policy extends to all persons engaged with MSDS Marine, including volunteers, students and members of the public
- not unlawfully discriminate because of the Equality Act 2010 protected characteristics of age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race (including colour, nationality, and ethnic or national origin), religion or belief, sex (gender) and sexual orientation
- oppose and avoid all forms of unlawful discrimination. This includes in pay and benefits, terms and conditions of employment, dealing with grievances and discipline, dismissal, redundancy, leave for parents, requests for flexible working, and selection for employment, promotion, training or other developmental opportunities

MSDS Marine commits to:

1. encourage equality and diversity in the workplace as they are good practice and make business sense
2. create a working environment free of bullying, harassment, victimisation and unlawful discrimination, promoting dignity and respect for all, and where individual differences and the contributions of all staff are recognised and valued

   This commitment includes training managers and all other employees about their rights and responsibilities under the equality policy. Responsibilities include staff conducting themselves to help the organisation provide equal opportunities in employment, and prevent bullying, harassment, victimisation and unlawful discrimination

   All staff should understand they, as well as their employer, can be held liable for acts of bullying, harassment, victimisation and unlawful discrimination, in the course of their employment, against fellow employees, customers, suppliers and the public
3. take seriously complaints of bullying, harassment, victimisation and unlawful discrimination by fellow employees, customers, suppliers, visitors, the public and any others in the course of the organisation's work activities

   Such acts will be dealt with as misconduct under the organisation's disciplinary procedures, and any appropriate action will be taken. Particularly serious complaints could amount to gross misconduct and lead to dismissal without notice

Further, sexual harassment may amount to both an employment rights matter and a criminal matter, such as in sexual assault allegations. In addition, harassment under the Protection from Harassment Act 1997 – which is not limited to circumstances where harassment relates to a protected characteristic – is a criminal offence

4. make opportunities for training, development and progress available to all staff, who will be helped and encouraged to develop their full potential, so their talents and resources can be fully utilised to maximise the efficiency of the organisation

5. decisions concerning staff being based on merit (apart from in any necessary and limited exemptions and exceptions allowed under the Equality Act)

   review employment practices and procedures when necessary to ensure fairness, and also update them and the policy to take account of changes in the law

6. monitor the make-up of the workforce regarding information such as age, gender, ethnic background, sexual orientation, religion or belief, and disability in encouraging equality and diversity, and in meeting the aims and commitments set out in the equality policy

   Monitoring will also include assessing how the equality policy, and any sporting action plan, are working in practice, reviewing them annually, and considering and taking action to address any issues

   The equality and diversity policy is fully supported by senior management and has been agreed with the employee representative.

Date of Issue: 1st August 2019

Signed:
Date of Next Review: 1st August 2021
Print Name: Mark James

4 Environmental Policy

The company understands that we have a responsibility to manage our activities in a way that promotes environmental best practice. We aim to fulfil this responsibility by taking the following steps:

1. Meet all applicable legislation, regulation, government guidelines and industry codes of practice;
2. Establish environmental standards, codes of practices and procedures of our own where they do not exist;
3. Seek to reduce environmental disturbance in all our activities;
4. Seek continual improvement in our environmental management through the setting of objectives and targets periodically subject to Management Review;
5. Wherever possible, make efficient use of natural resources by, amongst other actions, minimising waste, conserving energy and water and promoting recycling and the use of recycled materials;
6. Wherever possible, use supply chains with sound environmental ethics and source materials from sustainable and/or fair-trade origins
7. Incorporate consideration of environmental issues into our commercial decision making, applying this particularly to new developments, projects and acquisitions initiated by the Company;
8. Promote, through training and other initiatives, environmental awareness, understanding and individual responsibility amongst staff, in order to ensure that their working activities are carried out in line with the Environmental Policy;
9. Work with contractor, sub-contractors and major suppliers to ensure that they are aware of this policy and apply environmental standards compatible with our own;
10. Identify the key staff, including a Director, responsible for implementing and reviewing the Policy statement;
11. Respect, and where possible improve, the environmental quality of the locations in which we work, implementing site-specific environmental management plans for our construction activities;
12. To make its environmental information available to interested parties including the general public.

    MSDS Marine is in the process of implementing an environmental management system, based on the requirements of ISO 14001:2015, as the means of fulfilling this commitment.

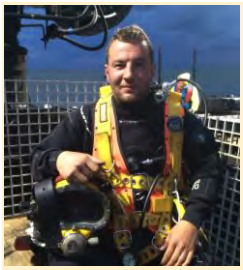
    Environmental Policy forms a standing item on the quarterly team meeting agenda, and any significant changes to the Environmental Policy are communicated to staff immediately via email.

Date of Issue: 1st August 2019

Signed:
Date of Next Review: 1st August 2021
Print Name: Mark James

Annex D – Staff CV's

MARK JAMES
Curriculum Vitae



Name
Mark James

Current Position
Director, Senior Archaeologist and Technical Manager
MSDS Marine Ltd

Education and Qualifications
2006 BSc (hons) Marine Archaeology, Bournemouth University

Professional Membership and Qualifications

- Scientific Diving Supervisory Committee (SDSC) accredited Diving Supervisor (2009)
- Commercially Endorsed Powerboat Skipper/Instructor
- Level 3 First Aid at Work
- Member of the Chartered Institute for Archaeologists (MCIfA)
- STWC'95
- HSE SCUBA DIVER
- HSE SURFACE SUPPLY DIVER
- HSE OFFSHORE TOP UP DIVER

Selected Career Summary
2012 – present: MSDS Marine Ltd, Director, Senior Archaeologist and Technical Manager
2011 – 2012: English Heritage Marine Planning Department, Maritime Archaeologist
2011: English Heritage Designation Department, Maritime Archaeologist
2009 – 2011: New Forest National Park Authority. Project Manager and Maritime Archaeologist for the Coastal Heritage Project
2008: Hampshire and Wight Trust for Maritime Archaeology, Project Officer

Key Expertise

Mark has over ten years of experience within the maritime archaeology sector both in the UK and abroad. Notable areas of expertise include geophysical and hydrographic data collection, processing and interpretation for archaeology, archaeological diving and dive management and the management of large scale archaeological projects. During his maritime archaeological career Mark has worked for the Hampshire and Wight Trust for Maritime Archaeology as a Project Officer, the New Forest National Park Authority as a Project Manager and English Heritage in both the Designation and Marine Planning departments.

Mark has always been heavily involved in the fieldwork aspect of maritime archaeology from hydrographic and geophysical survey to ROV inspections of sites to the management of archaeological diving operations.

In 2012 Mark set up MSDS Marine Ltd to provide marine archaeological support to both the public and private sectors. The support offered includes diving, geophysical and hydrographic services and project management. MSDS Marine have worked on a number of large scale projects including Round 3 Offshore Windfarms, the provision of diving contractor and geophysical services for the Scotland, Wales and Northern Ireland Component of the Heritage Assets in Relation to Marine Designation contract and high profile shipwreck investigations and excavations including the *London* and the *Rooswijk*.

MSDS Marine Ltd are a well-known and trusted coastal and marine archaeological contractor with clients including A2Sea Solutions Ltd, ADUS DeepOcean, APEM Ltd, Bibby Hydromap, Carcinus Ltd, Cotswold Archaeology, DONG Energy, The Dutch Cultural Heritage Agency (RCE), EGS International, EMU Ltd, E.ON, Historic England, Isles of Scilly IFCA, MarineSpace, Ørsted, Pascoe Archaeology Services, PMSS/Navitus Bay, Sea Change Ltd, Southampton University, Swathe Services, Trendarch and Wessex Archaeology.

Sector Specific Experience

Aggregate Extraction Licence Areas
Marks archaeological experience in the marine aggregate extraction industry is extensive and wide ranging, from time spent as the regulator at English Heritage (now Historic England) providing advice to developers and the Marine Management Organisation, to the archaeological assessment and interpretation of geophysical and hydrographic data in support of licence applications and the discharge of licence conditions.

Geophysical and Hydrographic Data Processing and Interpretation
Mark is experienced with different data sets and formats, software and outputs. The work undertaken within this area has varied greatly from the presentation of ultra-high resolution Multibeam Echo Sounder data for public display and engagement through to the inspection and interpretation of multiple sensor datasets to identify material of archaeological potential in advance of large scale development works.

Furthermore, Mark has processed and assessed data for general engineering works, volumetric studies, shipwreck and landscape interpretation and display within virtual environments.

Geophysical and Hydrographic Survey
Mark has managed, undertaken and acted as client representative on a large number of geophysical and hydrographic surveys, both in support of archaeological and specialist projects. A small sample of sites includes the designated wrecks of the Goodwin Sands, the *Rooswijk*, the *London*, the *Stirling Castle*, *Holland No.5* and *A1* submarines, the *Rena*, Normans Bay and Bouldnor Cliff. Sensors have included Multibeam Echo Sounder, Sidescan Sonar, Magnetometer and Sub-Bottom Profilers from a range of manufacturers.

Offshore Windfarms
Mark has undertaken a significant amount of archaeological work in support of Offshore Windfarms (OSWF) including Beatrice, Rampion, Navitus Bay, Walney Extension, Hornsea, Hornsea Two, Hornsea Three, Hornsea Four and Borkum Riffgrund Two. Works have included;

- preparation of method statements for archaeological work packages including; geophysical interpretation, geo-archaeological investigation, ROV assessment, Pre-Lay Grapnel Runs (PLGR) and beach reinstatement
- Written Schemes of Investigation (WSI)
- archaeological review and interpretation of geophysical and hydrographic data
- ground truthing of geophysical anomalies
- archaeological review of ROV data
- exclusion zone implementation and review
- licence condition review and compliance works

Non archaeological works include the geophysical assessment of cable free-span and jack-up locations on sites including Greater Gabbard.

ROV Inspection and Monitoring
During the course of his career Mark has undertaken archaeological inspection works with ROV's. This has included as the operator, including during a channel widening scheme alongside the historically significant wreck of the *Kennemerland* off the coast of Shetland, as the archaeological client representative during ground truthing works on Beatrice Offshore Windfarm and as the desk based archaeologist reviewing data prior to construction works on Walney Extension Offshore Wind Farm.

Diving Services
MSDS Marine Ltd are a diving contractor registered with the HSE providing diving services to the scientific and archaeological sectors. Mark has been working in the diving industry for 17 years and is highly experienced at running diving operations, including large scale excavations, on archaeologically significant sites, recently, and of note, this has included the *Rooswijk* on behalf of the Dutch Governments Cultural Heritage Agency (RCE) and the *London* on behalf of Cotswold Archaeology/Historic England.

Mark is an experienced archaeological diver and diving supervisor qualified both commercially (HSE Offshore Top Up) and recreationally.

Select Archaeological Fieldwork

2014 – Multibeam bathymetry survey of six wreck sites in North Wales

2014 – Archaeological excavation of the *London* wreck in the Thames Estuary

2014 – Diving investigation of three wreck sites in the Out Skerries, five wreck sites in North Wales, *Invincible* on Horsetail Sands and four wreck sites in the Sound of Mull, Scotland

2015 – Multibeam bathymetry survey of the *Baltic Ace* in the North Sea off Holland

2015 – Multibeam bathymetry survey of the *Rena* on Astrolabe Reef in New Zealand

2015 – Archaeological excavation of the *London* wreck in the Thames Estuary and *Invincible* on Horsetail Sands

2015 – ROV ground truthing of archaeological anomalies on Beatrice Windfarm in Scotland

2015 – Multibeam bathymetry survey of the *Stirling Castle* on the Goodwin Sands in Kent and seven wrecks including Normans Bay and *Holland No.5* out of Eastbourne

2015 – Sidescan sonar survey of wrecks in the Sound of Mull in Scotland

2016 – Multibeam bathymetry, sidescan sonar, sub-bottom profiler and magnetometer survey of the Brighton Marina wreck site in Brighton and the *Rooswijk* wreck site on the Goodwin Sands in Kent

2016 – Multibeam bathymetry, sidescan sonar and sub-bottom profiler survey of the *London* wreck in the Thames Estuary

2016 – Multibeam bathymetry, sidescan sonar, sub-bottom profiler and magnetometer survey of the *Rooswijk* wreck site on the Goodwin Sands in Kent

2016 – Diving investigations of, *Invincible* on Horsetail Sands, Thorness Bay in the Solent, the *London* in the Thames Estuary, Langdon Bay in Dover and the *Rooswijk* on the Goodwin Sands

2017 - Multibeam bathymetry survey of the designated wrecks of the Goodwin Sands in Kent

2017 - Multibeam bathymetry survey of the designated wrecks around the Isles of Scilly

2017 - Archaeological excavation of the *Rooswijk* designated wreck

2017 - Ecological diving investigations in Chichester Harbour

2018 - Multibeam bathymetry survey of the designated wrecks of the Goodwin Sands in Kent

2018 - Multibeam bathymetry survey of the Seehund midget submarine and a Junkers aeroplane

2018 - Archaeological excavation of the *Rooswijk* designated wreck

2018 - Ecological diving investigations in Chichester Harbour

2018 - Underwater laser scanner trials in Vobster Quay, Somerset

2018 - Intertidal shipwreck survey in Sandwich Bay, Kent

2018 - Diving investigation of the *Northumberland* wreck on the Goodwin Sands, Kent

2019 - Geophysical and hydrographic survey, Lebanon

2019 - Sidescan Sonar survey of site two of the *London* wreck site in the Thames Estuary

2019 - Diving investigations of the *London* wreck site in the Thames Estuary

2019 - Sidescan sonar, sub-bottom profiler, magnetometer and hydrographic survey in Anfeh, Lebanon

2019 - Sidescan sonar, sub-bottom profiler, magnetometer and hydrographic survey in Tabarja, Lebanon

Select Publications

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James, M. (2009). *New Forest National Park Authority Diving Operations Plan*. Internal Document for New Forest National Park Authority, Hampshire.

James, M. (2009). *Project Design for Phase 2 and 3 of the NFNPA Rapid Coastal Zone Assessment*. Tender Document for New Forest National Park Authority, Hampshire.

Hession, B. and **James, M.** (2008). *Hanson Aggregates Marine Ltd and CEMEX Areas 473 East, 474 Central and 475 Archaeological Monitoring Assessment 2007*. Maritime Archaeology Ltd, Southampton.

James, M. and Mason, B. (2008). *Port of Dover Hoverport Terminal Redevelopment Archaeological Assessment*. Maritime Archaeology Ltd, Southampton.

ALISON JAMES
Curriculum Vitae

Name
Alison James

Current Position
Director and Archaeological Manager, MSDS Marine Ltd

Education and Qualifications
2003 MA Archaeology, University of Liverpool
2002 BSc (Hons) Archaeology, University of Liverpool

Professional Membership and Qualifications

- Scientific Diving Supervisory Committee (SDSC) accredited Diving Supervisor (2009)
- PADI Open Water Scuba Instructor
- Level 3 First Aid at Work
- Member of the Chartered Institute for Archaeologists (MCIfA)
- STWC'95
- VHF Radio Operator
- Institute of Leadership and Management Course Level 3 Qualification in Management of Volunteers

Selected Career Summary
2018 – present: Director at MSDS Marine Ltd.
2018 – present: Trustee at Nautical Archaeology Society
2009 – 2018: Maritime Archaeologist at Historic England
2005 – 2009: Education Officer at Hampshire and Wight Trust for Maritime Archaeology
2004 – 2005: Administrator and Tutor, Nautical Archaeology Society (part time)
2003 – 2005: Study Supervisor and History Teacher (unqualified), Hounsdown Science College

Key Expertise

Alison has over fifteen years of experience within the archaeology sector both in the UK and abroad. Notable areas of her expertise include:

Heritage Management
At Historic England Alison was responsible for the wrecks designated under the Protection of Wrecks Act 1973. She identified threats to the sites and put mechanisms in place to reduce threat and manage the sites in line with Historic England's Conservation Principles.

Project Management
At MSDS Marine Ltd Alison acts as a Project Manager managing a number of high-profile projects including work for Historic England on the creation of virtual dive trails and on the creation of protective markings for wreck sites. She ensures projects are delivered on time and to budget and that a high-quality product is delivered.

At Historic England Alison acted as Project Assurance Officer for a number of contractors who have work commissioned through Historic England's funding programme. She has managed a number of HLF, and other, projects from inception to completion.

Maritime Archaeology
Alison provides specialist advice to colleagues throughout the sector, as well as to volunteers, as to issues of best practice in maritime archaeology.

Managing Volunteers
Alison has extensive experience in managing volunteers. At Historic England she managed the largest number of volunteers within the organisation and is now working with protected wreck site volunteers on a project commissioned by Historic England. She provides advice, guidance and encouragement to them as well as ensuring they are working in line with best practice. In addition, Alison is the voluntary Protected Wreck Association Communications Officer and a Trustee of the Nautical Archaeology Society.

Engagement and Training
Alison has a strong background in public engagement and training. From managing an e-Newsletter to keep the public up to date with marine developments from Historic England to managing all elements of Historic England's marine social media including a successful verified Twitter account. Alison provided the public face of maritime archaeology at Historic England by attending various events and conferences with information stands.

Alison has designed and run many training courses to various audiences from professional to public. Notably, Alison designed and ran the Maritime Archaeology Access and Learning ALSF workshops whilst at HWTMA and has been an active Nautical Archaeology Society Tutor for many years.

In June 2018 Alison joined MSDS Marine as co-Director bringing all of her experience within the sector to MSDS Marine Ltd. She now manages all MSDS Marine social media and blogs.

Sector Specific Experience

Director, MSDS Marine Ltd.
Alison has been at MSDS Marine Ltd since June 2018 and is leading on a number of existing projects including work on virtual dive trails and protective marking solutions. She is running projects to deliver capacity building in the volunteer sector and to provide training in the rollout of the new OASIS archiving system for the

wider archaeological sector on behalf of Historic England.

Alison is currently managing the Post Excavation phase of work on the Rooswijk1740 project.

Maritime Archaeologist, Historic England

Alison was responsible for casework delivery in relation to England's existing, and new, Designated Wreck Sites, and making decisions, taking advice from elsewhere when necessary including: - Protection of Wrecks Act designations and other recommendations, administration and licensing; - assessing unauthorised works and damage to designated monuments; liaising with Licensees and other stakeholders;

- to assist colleagues in securing the protection of heritage assets in the marine and coastal zone;
- developing management information systems for England's Designated Wreck Sites, including GIS and databases;
- assisting the determination of priorities for recording repair, management and interpretation works on monuments, and promoting programmes of work at priority monuments through advice and recommendation of grant aid;
- assisting the identification of priorities for commissioning archaeological projects (including strategic projects), prescribing briefs, assessing project designs, overseeing project implementation and certifying completed work in relation to the Historic England Action Plan;
- to take a proactive role relating to casework particularly in identifying potential problems and proposing solutions;
- to dive and carry out archaeological work, according to Historic England Health & Safety policy and as directed;
- to promote conservation generally as the Historic England representative on matters relating to archaeology and ancient monument, liaising with outside bodies, including other environmental agencies, members of the public and fellow professionals;
- to assist in preparation of paper and reports on ancient monuments and historic landscapes, internally and externally, including DCMS and Historic England's advisory committees;
- to promote public enjoyment and understanding of heritage assets and their preservation

Alison represented Historic England at a variety of national bodies and has been able to forward historic environment interests. Alison provided advice to the HLF through the Industrial and Maritime Panel and was also a member of the Scientific Diving Supervisory Committee and the CIfA Voluntary and Community Archaeology Special Interest Group.

In relation to the Contract for Services in Support of Marine Designation Alison assisted in the development of the annual programme of investigation, preparing site specific briefs and managing issues as they developed during fieldwork.

Alison regularly monitored projects delivered by external specialist contracts and applied her knowledge to them. Elements of leadership here included proposing and recommending the submission of Project Proposals; advising/ recommending on variations to the proposed/ agreed work programme; providing advice/ recommendations to resolve conflict; providing guidance on issues and risks and providing technical archaeological advice during operations.

Alison acted as a focal point for Licensees and Historic England Affiliated Volunteers. Licensees (individuals authorised by the Secretary of State to access Protected Wreck Sites) regularly required archaeological advice from Historic England in relation to planned activities underwater.

Alison provided expert witness statements to colleagues in relation to Heritage Crime investigations as required that have been used in successful prosecutions. This advisory role provided consistent knowledge and leadership to this sector.

Alison managed key elements of Historic England's Coastal and Marine communications including the Licensee's Bulletin and the @HE_Maritime twitter account to facilitate the dissemination of archaeological advice and information. She collated and assessed the results of Licensees work in order to provide Heritage at Risk data and to develop future site priorities.

Alison regularly liaised with a number of national bodies including the Receiver of Wreck and the Marine Management Organisation and provided competent high-level advice. Alison represented the marine interest of Historic England on the HLF Industrial and Maritime Transport Committee.

Alison's work as a Project Assurance Officer work meant that she encountered a wide range of issues that required fact finding, analysis and initiative. Working with both external organisations and internal specialists to ensure projects are fit for purpose requires a high level of interpretation and judgement. Alison acted as PAO for the Contract for Archaeological Services in Support of Marine Designation (value = c.£300k p.a.). Alison was responsible for assessing and recommending the rewards of individual payments based upon performance indicators being met.

Alison was responsible for devising and recommending the prioritisation and financial resource allocation for the contract in discussion with the Marine Designation Advisor. She was also PAO for six other funded organisations; the Nautical Archaeology Society, CISMAS, SeaDive, Pascoe Archaeological Services, the *Hazardous* Project Group and Bournemouth University (for the Swash Channel Project only). Alison helped plan and recommend the strategic spend through commissions for the management, presentation and interpretation of England's Protected Wreck Sites.

By taking forward the management of England's Protected Wreck Sites Alison routinely gathered and assessed information from a variety of sources to develop research priorities. Here, her decisions related to the accuracy and efficiency of Historic England's related grant, maintenance and internal work programmes (e.g. risk analysis). Within this framework and against the range of choices available, she determined annual priorities for the conservation, management, recording and monitoring of designated wrecks. This comprised developing both research and technical strategic project work and the promotion of investigation at priority sites through advice and recommendation of grant aid (such as deciding to undertake excavation work on the Swash Channel and *London*) as well as approving the payment of related grants (as managed through commissions). Such decisions were concerned with many key departmental objectives, related to several work areas within Historic England and identified long term corporate objectives.

Alison provided advice to the Maritime Designation Adviser on the issuing of licences under the Protection of Wrecks Act 1973. She undertook the research required to assess the suitability of a licence holder and the work proposed in their application and provided a recommendation on the licence for the Maritime Designation Adviser to approve before passing final recommendation to DCMS.

Alison had a key role in bringing to fruition a number of projects that have received awards relating to the protected wreck sites including a judge's commendation in the Association of Heritage Interpretation Awards for the *Iona II* dive trail, the Marsh Award for Community Archaeology for the volunteer team working on the *London* and a nomination in the Current Archaeology Awards in 2016 for the high profile project on the *London* excavation.

The national responsibilities of the role required Alison to access, interpret and collate information from various local, regional and national repositories. Alison is able to deal with complex situations holistically and can demonstrate confident decision making in a broad range of activities. By taking forward the statutory management of England's nationwide Protected Wreck Sites, Alison balanced varied competing priorities arising from the management of this large area of work. Alison can appraise, assess, analyse, assimilate and interpret large volumes of complex marine archaeological and oceanographic data to enable her to formulate strategic decisions (some of this information was managed within a bespoke database, developed to her specification working with a software developer); Alison reviewed and developed the complex strategic needs of Protected Wreck Sites on a national scale and used her initiative to respond to changes in priorities (caused by new threats, for example) and plan accordingly.

Alison demonstrated a confident decision-making ability through both her annual risk assessment work for Heritage at Risk audit purposes and through her work helping to bring a number of large-scale excavation projects (notably on the *London,* Swash Channel and recently on the *Rooswijk*) to completion.

Alison used her own professional judgement to assess the significance/value of candidate sites for designation under the Protection of Wrecks Act, 1973, prior to commissioning a full assessment. In some cases, this required liaison with colleagues in the regional teams and within the Marine Planning Unit. Alison regularly dealt with, and advised on, licensing applications and queries enabling third party access to designated wrecks. This involved problem solving and a high degree of negotiation and conflict resolution where there is no set precedent, often involving dealing with challenging external customers.

Alison's work with volunteer stakeholders for protected wreck sites involved a large amount of high-level work to provide conflict resolution and negotiation between individuals for the benefit of the sites. Alternative approaches regularly need to be devised to tackle disputes and situations that often have no clear way forward and need tackling sensitively. A recent project she is involved with involves a number of volunteer stakeholders, the Dutch Government and an individual with a salvage agreement. Her liaison work between all parties has shown that she is able to demonstrate a high level of understanding of the bigger picture and is helping to ensure that a project to excavate a high risk, high profile site is able to happen despite a lot of conflicting views and historical conflict.

Education Officer, Hampshire and Wight Trust for Maritime Archaeology

Alison's role included managing HLF and other projects (including a large European Leader + funded programme), fundraising including grant applications, providing educational activities for the community,

planning and delivering educational talks, managing the running of the Underwater Archaeology Centre including organising and delivering school visits, planning and organising outreach activities and the creation of educational resources.

One notable element of this role was the Southampton Young Archaeologists Dive In! HLF Project. Alison developed the project and gained funding to run it in response to identifying a need to involve more young people with maritime archaeology. The project involved taking a group of eight young people and enthusing them with the rich and varied heritage of the Solent through diving and intertidal fieldwork, and then enabling them to spread awareness of the regions submerged heritage to the wider public. This was achieved through the creation of a website and numerous displays at regional events. Out of the eight young people involved two went on to undertaken archaeology degrees, one became a marine biologist and the others have stayed diving – a high success rate!

Alison also planned and delivered a series of workshops for a group of adults with Special Educational Needs resulting in a travelling exhibition of their history related artwork. Alison was responsible for planning and promoting the Winter Lecture Series which the Hampshire and Wight Trust for Maritime Archaeology held for the Friends of HWTMA and the general public in 2005 and 2006. The last series was so successful it sold out from the first lecture onwards.

Alison was responsible for the running and management of the Underwater Archaeology Centre on the Isle of Wight. She directly managed the budgets associated with the day to day running of the Centre and have also run two associated grant funded projects. Alison planned, managed and completed the successful refurbishment of the Centres Exhibition and Shop. This project involved mobilising and enthusing the paid team of staff and a large team of volunteers. This culminated in a day of celebration and a public opening.

Select Publications

James, A. (2019). *Heritage Crime: Protected Wreck Management Case Study*

James, A. (2018). *Review of the Virtual Dive Trails Scheme (7374): A big splash or a damp squib?*, Historic England.

James, A. (2017). *England's Protected Wreck Sites: Underwater Exploration Without Getting Wet!*, Historic England Research News.

James, A. (2016). *Diving into History: 42 Year of BSAC and England's Protected Wrecks*, SCUBA Magazine.

James, A. (2015). *Accessing England's Protected Wreck Sites: Guidance for Divers and Archaeologists, 3rd Edition,* Historic England.

James, A. (2015). *Accessing England's Protected Wreck Sites: Guidance for Divers and Archaeologists, 3rd Edition,* Historic England.

James, A. (2013). *Researching, Protecting and Managing England's Marine Historic Environment,* SHA 2013

James, A. (2013). *Diving into History with the English Heritage Dive Trails,* Heritage Calling Blog

James, A. (2013). *The London: A Case Study* in England's Shipwreck Heritage by Serena Cant, Historic England

James, A. (2009). *Engaging Audiences with Maritime Archaeology: Delivering education, learning and training experiences from the classroom to the field*, Proceedings of the 13th Annual EAA Conference

James, A. and Satchell, J. (2008). *Maritime Archaeology Access and Learning ALSF Workshops: Final Report,* Unpublished report for English Heritage

TOM HARRISON
Curriculum Vitae

Name
Tom Harrison

Current Position
Maritime Archaeologist, MSDS Marine

Education and Qualifications
2015 MSc Maritime Archaeology, Bournemouth University
2014 BSc (Hons) Archaeology, Bournemouth University

Professional Membership and Qualifications

- SSI Advanced Open Water Scuba Instructor
- PADI Open Water Scuba Instructor
- HSE Surface Supply and Offshore Top-up
- ASSET SCUBA and Cylinder Technician
- Kirby Morgan Hat Technician
- OTS Full Face Mask Technician
- NAS course tutor
- First Aid at Work
- STCW 95 Personal Survival Techniques

Selected Career Summary
2017 – present: MSDS Marine Ltd.
2016 – 2017: Maritime Archaeologist at Wessex Archaeology
2014 – 2014: Field Archaeologist at Bournemouth Archaeology

Key Expertise

Tom has been working full time in Maritime Archaeology for five years, having finished his Masters in 2015. In this time Tom has gain extensive fieldwork experience, having working on high profile projects such as the dredging of Portsmouth Harbour and the excavation of the *Rooswijk*. Tom joined MSDS Marine in June 2017. Tom has also previously worked on the Contract for Services in Support of Marine Designation, as well as working on multiple protected wreck sites including the *Swash Channel Wreck*, *Coronation* and HMS *Invincible*.

Tom is a technical diver (TRIMIX), Advanced Open Water Instructor (SSI and PADI) and HSE commercial diver (SSDE Top-up). Tom is also a qualified SCUBA equipment and Kirby Morgan service technician.

During his MSc in Maritime Archaeology, Tom researched the uses of Duplex Drive (swimming) tanks during the Second World War, and worked on the reconstruction of a section of prehistoric ship as part of an experimental archaeology and public outreach project.

Sector Specific Experience

Maritime Archaeologist, MSDS Marine Ltd.
Working with MSDS Marine Tom has been heavily involved with the excavation of the *Rooswijk* over both the 2017 and 2018 seasons. As well as being a diver on the project he has been involved with the setup, management and post excavation stages of the project, including coordinating archaeological work on site, finds management and project-based GIS.

Since excavation has ended, Tom has been involved in the public outreach of the project and the development of the *Rooswijk* Virtual trail.

During 2019, Tom conducted the archival research, background history and the structural survey of three WW2 MTB's recently purchased by the National Museum of the Royal Navy as part of their Coastal Forces project. The ships surveys included the identification and phasing of the entire ships structure. Tom produced detailed phase plans of the three vessels as part of the survey results.

Tom has also been working on coastal watching briefs, most recently on the HORNSEA 2 intertidal works near Grimsby. As one of two retained archaeologists during 2019, Tom would conduct regular site visits and conduct archaeological watching briefs during intertidal excavations. Tom has undertaken liaison with clients on behalf of MSDS Marine in relation to the implementation of Protocols for Archaeological Discoveries.

Tom is also heavily involved in diving projects undertaken by MSDS Marine, including both archaeological and commercial projects. Recent projects have included co-ordinating the diving for two volunteer diving projects on protected wreck sites on behalf of Historic England and for filming of the *London* wreck for National Geographic. Working as a lead archaeologist, diver and technician, he has also supervised multiple small SCUBA projects.

In 2018, Tom qualified as an ASSET SCUBA technician and has since been responsible for the maintenance and servicing of all MSDS Marine dive equipment.

Maritime Archaeologist, Wessex Archaeology
Following the completion of his Masters degree, Tom began working for Wessex Archaeology at the beginning of 2016. During this time, Tom was a key diver on the Contract for Services in Support of Marine Designation and the principle archaeologist for the dredging of Portsmouth Harbour. As the principle archaeologist, Tom was responsible for the continual liaison between archaeologists and the client, regular site visits including

watching briefs, archival research, find identification and processing, find recording and reporting, archiving and museum deposition.

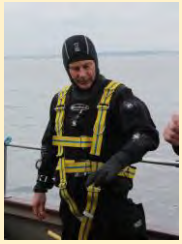
Tom also conducted archaeological monitoring and multiple watching briefs including terrestrial, intertidal and at sea. Tom regularly communicated with the public, clients and the Receiver of Wreck, as well as multiple museums in order to house new collections and arrange disposition.

Other Experience
Tom has worked extensively as a volunteer diver within maritime archaeology, both as a student and still does during his time off. Working with Bournemouth University, he has also returned to help in training the new divers on the Masters course, and taken part in some large-scale projects such as the *Swash Channel Wreck*, HMS *Invincible* and the Forgotten Wrecks of the First World War project run by the Maritime Archaeology Trust.

Select Publications

Cousins, T. Harrison, T. Parham, D (forthcoming). The *Maritime Archaeology of Duplex Drive Tanks in the United Kingdom*

Michael Pitts
Curriculum Vitae



Name
Michael Pitts

Current Position
Cameraman and Producer

Education and Qualifications
2004 Inspiration Closed Circuit Rebreather
2002 Extended Range Diver
2002 Advanced Trimix Diver
2001 Semi-closed rebreather
1980 HSE Part 1

Professional Membership and Qualifications

- National Powerboat Certificate Level 2
- DDRC Diver Medic Technician
- Divers Offshore Medic

Key Expertise

Michael Pitts is a cinematographer and film producer with over 30 years' experience of making wildlife and science documentaries across the world. His work has appeared in numerous BBC, Discovery Channel and National Geographic television productions.

Michael was principal cameraman for the underwater filming for two recent BBC1 series: Sir David's Attenborough's 'Great Barrier Reef' and 'Mission Galapagos'.

He has recently filmed and produced a major six-part series set in Hong Kong and mainland China. Narrated by Sir David Attenborough Each 30-minute episode looks behind the scenes of Kadoorie Farm and Botanic Garden at their work on nature conservation, sustainable living and holistic education

Michael was the Director of Photography on 'A Plastic Ocean', which was released in January 2017. It shows the proliferation of plastic and the damage it causes to our environment and wildlife across the world's oceans.

In January 2018, he completed filming a one-hour documentary for Discovery Channel. The film looks at Dubai's surprisingly diverse wildlife living within its deserts, along its coastline and close to the city.

An ardent shipwreck enthusiast Michael is currently filming, the excavation and recovery of artefacts on the *Invincible* a 3rd Rate, 74-gun, warship wrecked in 1758 on the Horsetail Sands in the Eastern Solent Channel. Built by the French but captured by the English at the First Battle of Cape Finisterre this ship was to revolutionize warship design for Lord Nelsons Navy.

He has been awarded emmys for cinematography on two landmark BBC productions: Sir David Attenborough's 'The Private Life of Plants' and the first 'Blue Planet' series. In addition, he has received the Kodak award for cinematographic excellence and the New York Festivals Gold award for cinematography for his filming of 'Dragons of Komodo'.

Sector Specific Experience

2019

BBC - Blue Planet Live - Great Barrier Reef

Formasette/National Geographic - Monserrate - Tanzania (reef filming)

National Museums Royal Navy - Commission to film Invincible wreck site

Offspring - Amazon commission to film in Raja Ampat Indonesia - Night sequences on reef.

2018

Plimsoll – Hostile Planet - Costa Rica - Turtle arribada

Wild Dubai – Plimsoll/Discovery Channel

Filming the wreck of the Rooswijk for Dutch Heritage

Filming the wreck of the Invincible – National Geographic

2017

Wild Dubai – Plimsoll/Discovery Channel (I hour special)

Filming the wreck of the *Invincible* – National Geographic

Filming the wreck of the *Rooswijk* for the Cultural Heritage Agency of the Netherlands and MSDS Marine.

Completion and delivery of six, 30-minute episodes for our client, KFBG. Garden in the Sky. Filmed and Produced by Michael Pitts the films look at conservation and sustainability in Hong Kong and China. Narrated by Sir David Attenborough – Currently being shown throughout SE Asia. Three-year project which commenced in late 2013. Also narrated in Mandarin and Cantonese.

2016

BBC/Atlantic. Galapagos with Liz Bonin – DoP all underwater and topside NatHist and sync.

Continuation of the *Invincible* shipwreck project

BBC Under Italy with Presenter Michael Scott. All underwater sequences. Naples and Venice

2015

BBC/Atlantic. Great Barrier Reef with Sir David Attenborough –DoP all underwater and topside natural history and topside natural history filming.

Celtic Whale for Big Wave Channel 4 DoP underwater and topside with Ben Fogle

Continuation of the *Invincible* shipwreck project

2014

BBC Atlantic series Ep 2 Falklands and Ascension DoP all underwater and topside natural history filming. Plus making of behind the scenes for episode 2.

BBC Wild Japan DoP underwater

Continuation of the *Invincible* shipwreck project Eastern Solent Channel

BBC Atlantic series Ep 2 Iceland/Silfra

2013

BBC Shark DoP North Carolina war wrecks and Ragged tooth sharks.

Commenced - Garden in the Sky. six-part series in Hong Kong and China.

Continuation of the Invincible shipwreck project

2012

BBC Swimming with Crocodiles Botswana. With Ben Fogle

2009/10

Desert Seas for Icon/NatGeo DoP underwater and topside

Award winner for cinematography at Missoula Film Festival.

2009

Media Training Tobago, Sports Diver USA

“Blue Peter” Maldives - BBC

Lecturer, British Council Bulgaria

2008

“Life” Falklands – BBC NHU

“Life” Solomon Islands – BBC NHU

“Oceans” Red Sea – BBC Science

“Oceans” Bahamas – BBC Science

“Life” Bahamas – BBC NHU

2007

“Life” Falklands – BBC NHU

“Oceans” Sea of Cortez – BBC Science

“Life” Bahamas – BBC NHU

“Darwin’s Garden” – BBC Scotland

“Pacific Abyss” – BBC NHU 3 X I hour progs

“Migrating Bottles” Bulmer’s Cider Commercial

“Penguin Safari ” - National Geographic Channel

“Coasts” – BBC Birmingham

“In the Womb” - Channel 4

“Nature of Britain” – BBC NHU

“Secrets of the Caribbean” – BBC NHU 4 X I hour progs.

2005

“Ocean Odyssey” - Impossible Pictures

“Secrets of the Caribbean” - BBC NHU

“The Last Hunt”- SKY TV

2004

“Walking with Monsters” in Canaries - Impossible Pictures

“Amazon Abyss“ - BBC NHU

“Wetlands“ - Hong Kong Government

“Time Machine “ in UK - BBC NHU

2003

“Darien Disaster in Paradise “ in Panama - BBC Horizon

“Sea Monsters “ Prog. 3 in New Zealand / Studio London - Impossible Pictures

“Britannic“ - National Geographic / Carlton TV

Bull Sharks in South Africa, USA and Cuba - Discovery Channel / Image Impact

“Making Waves“ in Portsmouth - Carlton TV

“Beyond the Abyss / Dive to Shark Volcano “ in the Cocos Islands - BBC NHU

“Titanic’s Doomed Sister“ in Greece - National Geographic / Carlton TV

"Time Machine " in Hong Kong and Palau - BBC NHU

2002/2003

"Sea Monsters" Programmes 1 & 2 in Egypt / Bahamas.- Impossible Pictures

2002

"Running the Gauntlet " 2 X 3 min. Programmes - Carlton TV

2001/2002

"Australasia " series - BBC NHU

"Malaria – The Fall of the Rome" - BBC Glasgow

"Sharks ", Thresher sharks in the Philippines - BBC NHU

"Walking with Beasts", Prog. 6 - BBC Science & Features

"Killer Whales", Wildlife Special" - Norway - BBC NHU

2000/2001

"Walking with Beasts", Prog. 2 - BBC Science & Features

"Treasure Islands " - Natural World, BBC NHU

1999/2001

"War Wrecks of the Coral Seas", Natural World - BBC NHU

1999

"Dive to Shark City "- BBC NHU

1997/2000

"Blue Planet " BBC NHU

Awards

2002 EMMY award for Cinematography - " Blue Planet " .

2002 Silver medal at New York Film Festival for Cinematography - "War wrecks of the Coral seas " .

2000 Bronze Medal at New York Festival for Cinematography - "Midway: Island of Life ",

1999 Gold and Bronze awards at Diver Magazine underwater Film Festival, Birmingham - "Dive to Shark City " and "Lost Lakes of the Pacific ".

1999 Bronze award for Stills portfolio at Diver Magazine underwater Film Festival, Birmingham.

1998 Silver Medal at the New York Film Festival for Cinematography - "Dragons of Komodo ".

1996 EMMY Award for Cinematography - "Private Life of Plants".

1996 Kodak Award for Excellence - "Private Life of Plants".

1996 Royal Television Society Craft award nomination for Camerawork - QED "The Secret Life of Sea horses "

1993 Gold Camera award in Environmental Issue and Concerns category. US International film and video festival, Chicago - "Hoi Ha Wan - Bay Beneath the Sea". Gold Camera award in Hong Kong Short film festival - "Hoi Ha Wan". Special jury prize at Antibes Underwater Film Festival - "Hoi Ha Wan ".

1989 Dimitri Rebikoff prize at Antibes Underwater Film Festival -"Edge of Uncertainty"

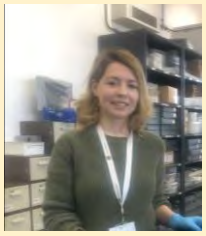
1985 Hugh Baddley Award for Best Amateur Film by the Royal Photographic Society - "The Artificial Reef ".

1985 Runner up Wildlife Photographer of the year - underwater section.

Photographic Credits - Books

"Wild Down Under"
"Sea Monsters "
"Walking with Dinosaurs"
"The Green Dragon"
"Return to the Heart of the Drago"
"Wild India"
"New Guinea - An Island Apart"
"Private Life of Plants "

Heather Stewart
Curriculum Vitae



Name
Heather Stewart

Current Position
Conservator

Education and Qualifications
2015 MA Conservation of Museum and Archaeological Materials, University of Durham
2010 MA Archaeology, University of Glasgow

Selected Career Summary
2020 – present: Conservator at MSDS Marine Ltd.
2019 – 2020: Conservation Technician, The David Livingstone Trust
2015 – 2017: Conservator, Esmerelda Project
2016 – 2016: Conservation Supervisor, Rutgers University Field School
2012 – 2014: Conservation Placement, York Archaeological Trust

Key Expertise

Heather is a conservator with a specialism in marine archaeological finds and additional experience of working on terrestrial sites and museum objects. She has extensive experience working in the UK and internationally.

Heather is skilled in the research and analysis of objects and has experience of sampling methodology and chemical testing. Heather has experience in treating many types of artefacts and materials from waterlogged wood, leather and textiles through to metals from the marine environment. She is proficient in the use of X-radiography (X-ray) and has worked with specialists to test samples using X-ray fluorescence (XRF), X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM-EDX).

Heather is the project conservator for the *Rooswijk*1740 project. In addition, Heather was responsible for running the conservation lab of the *Esmerelda* Project in Oman where she gained experience of managing budgets, sourcing materials, organising archival work, teaching, and training.

Sector Specific Experience

Conservator, MSDS Marine Ltd.
Heather is joined MSDS Marine in February 2020 as a Conservator and is responsible for conservation of the artefacts resulting from the 2017 and 2018 excavation seasons on the *Rooswijk* as well as working on other MSDS Marine projects as required. Notably, she is involved with our work on conservation assessment and conservation management plans.

Conservation Technician, The David Livingstone Trust
Heather's main duties and responsibilities included locating objects for display, packing objects for transport, conserving objects and cataloguing objects on Modes Software.

Heather worked with volunteers to produce archival book sleeves for the Blantyre works Library. She enacted conservation cleaning on basketry, hide shields and wooden instruments. Her role involved working with the Museum team to prepare items for display and assisting others in successfully achieving their goals.

Conservator, *Esmerelda* Project, Oman
During the excavation stage of work Heather took part in finds cataloguing and the preparation of finds for transport and treatment of the *Esmerelda* wreck in the Al Halliyinah islands of Oman. During this time, she worked with Oman's Ministry of Heritage and Culture, Bournemouth University and Blue Water Recoveries.

Following the excavation, Heather was tasked with the set-up of a laboratory for the treatment of objects within Oman and had to work within a budget and source materials. She recorded and conserved various objects including Cu-Alloy breech chambers, Cu-Alloy Arquebus gun stocks, Fe-Alloy cannon balls, Pb-Alloy shot and large stone shot.

Heather provided training for Ministry of Heritage and Culture staff in basic conservation methodologies such as object photography, finds recording, health and safety, the use of archival storage materials and object handling. She had the opportunity to work with the staff of the National Museum of Oman and took part in a lecture series intended to inform the public of the work.

Heather made connections to provide practical solutions for object care. This included working with Sultan Qaboos University to enact testing of samples and to access facilities for X-Ray. She initiated communications between Museum departments to set up an archive and find volunteers.

Upon completion of the project Heather worked with the relevant Ministry departments to organise paperwork for the transport of items to be treated and analysed within the UK. She worked with specialists to record the collection including laser scanning artefacts with Warwick University and the excavation and sampling of sealed breech chambers.

Conservation Supervisor, Rutgers University field school, Vancone, Italy

The site of Vancone was a Roman Villa excavated as part of a teaching excavation for students of Edinburgh University and Rutgers University. The villa had numerous rooms with standing decorative wall plaster and complex mosaics. Heather was employed as the conservation supervisor for the site working with a conservation assistant and two Getty interns. The team were tasked with in-situ preservation of the walls and mosaics prior to reburial at the end of the excavation. This involved the use of lime plaster and varied techniques. The interns were trained in conservation techniques and then tasked with supervising students with an interest in conservation. Staff were also required to block lift stucco fragments for consolidation and cleaning as well as various small finds where possible within the field laboratory.

Placement, York Archaeological Trust

As part of her Masters course, Heather completed a nine-month conservation placement. During her time at YAT she conserved various objects including a prehistoric ash paddle with an outbreak of acidic salts related to PEG treatment, a composite grapeshot canon-ball from a marine environment and various wood, leather, glass, and metal-alloy objects from shipwreck excavations. This included assisting in the cleaning of large waterlogged wooden items such as early railroad tracks.

Heather had the opportunity to stabilise a waterlogged wood assemblage with PEG and was given training in wood identification with wood specialist Steve Allen. In addition, Heather undertook wood density measurements and PEG calculations. She also tested waterlogged prehistoric bone to investigate a conservation methodology.

During the placement Heather learned to produce assessment reports by testing cleaning methodologies for a large assemblage of archaeological stone and provided recommendations for further work. Heather also produced desktop assessments including an investigation into the construction of a wooden support for a Roman lead coffin burial by analysing the mineralised organics on nails and relating these to their positioning within a grave. Heather also provided the initial report on environmental monitoring for the YAT store using tiny tag data and plans. She also had the opportunity to assist in the block lifting of material from a site and take part in the repackaging of an archaeological archive in Barnsley. Her experience working with YAT has provided numerous transferable skills for working within archaeological units and archival settings.

Annex E –Product Descriptions

MSDS Marine have identified the following as products and the following descriptions are intended to act as specifications for them. It may also be necessary to add product descriptions during the course of the project if additional products are identified.

Product Number	1
Product Title	Communications Plan
Purpose of Product	To enable Historic England, MSDS Marine and all project participants to ensure a stream lined and consistent approach for engagement with key stakeholders is agreed.
Composition	A document containing the following information: • Background • Purpose, Audience and the Message • Key Roles and Responsibilities • Branding • Channels of Communication • Evaluation and Assessing Impact • Action Plan
Format	PDF
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Project Executive to ensure contents are achievable and will meet the requirements of Historic England
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	February 2021

Product Number	2
Product Title	Highlight Reports
Purpose of Product	To keep Historic England updated with project progress and to identify any issues as they arise.
Composition	• Project Name and Number • Author • Date • Circulated to • Period Covered • General Progress • Timetable • Budget • Resources

	• Product and Tasks completed during the period • Products and Tasks to be completed during the next period • Project Risks • An up to date report by task against the task list
Format	PDF
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Historic England and the Project Executive to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols.
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	May 2021

Product Number	3
Product Title	Tracked Diver Survey
Purpose of Product	To undertake a five-day tracked diver survey to plot key features on the *London.* The purpose is not to undertake finds recovery although as identified in this Tender document some high-risk material may be recovered if deemed appropriate.
Composition	Five-day diver survey on SCUBA utilising diver tracking technology
Format	Fieldwork
Allocated to	MSDS Marine Project Executive /Dive Supervisor (Mark James)
Quality criteria and method	Review by Historic England and the Project Manager to ensure contents meet the aim of the project briefs and the specified deliverables. CIfA CPD Accreditation. All quality assurance is undertaken in line with current internal MSDS Marine protocols.
Person/group responsible for quality assurance	MSDS Marine Project Manager (Alison James)
Planned completion dates	May 2021

Product Number	4
Product Title	Conservation of recovered finds

Purpose of Product	The conservation of any artefacts recovered during fieldwork (subject to the strict protocols for recovery identified in this Tender document).
Composition	Conservation as deemed appropriate by the Project Conservator (Heather Stewart) in consultation with Historic England Senior Conservator Angela Middleton and specialist assessment by Historic England specialists through Angela Middleton.
Format	
Allocated to	Heather Stewart (MSDS Marine Conservator) and Angela Middleton (Historic England Senior Conservator)
Quality criteria and method	Review by Project Manager to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols.
Person/group responsible for quality assurance	MSDS Marine Project Manager (Alison James)
Planned completion dates	October 2021

Product Number	5
Product Title	Digital Site Plan
Purpose of Product	To create a digital site plan with geo referenced positions of artefacts and key site features against the Multibeam bathymetry.
Composition	A digital plan in Site Recorder.
Format	Digital file
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Project Executive to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols.
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	July 2021

Product Number	6
Product Title	Training

Purpose of Product	To provide the affiliated volunteer team with support and training to create a digital site plan and maintain it following this project.
Composition	Workshop and practical session held at the MSDS Marine offices.
Format	3-day workshop
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Project Executive to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	July 2021

Product Number	7
Product Title	Training Support
Purpose of Product	To provide ongoing support to the affiliated volunteer team to embed learning.
Composition	Email, phone and in person support
Format	Three days of time allocated.
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Project Executive to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	October 2021

Product Number	8
Product Title	End of Project Report including Impact Assessment
Purpose of Product	To report on the successes of the project and identify challenges faced in its execution to ensure continuing best practice.
Composition	The report will include an impact assessment in order for Historic England to i) gauge the effectiveness of activities undertaken as part of the project and ii) judge the significance of the changes or benefits brought about by the project

Format	PDF
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Project Executive to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	September 2021

Product Number	9
Product Title	Article for HE Research News and the International Journal of Nautical Archaeology
Purpose of Product	An article and images for Historic England Research News and IJNA to promote the project and present the work undertaken to a wider audience.
Composition	Short articles detailing the background, methodology and results of the project
Format	PDF
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Review by Project Executive to ensure contents meet the aim of the project briefs and the specified deliverables. All quality assurance is undertaken in line with current internal MSDS Marine protocols
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	October 2021

Product Number	10
Product Title	OASIS Record
Purpose of Product	An Online Access to the Index of Investigations (OASIS) form will be submitted for all archaeological events for dissemination purposes.
Composition	A completed OASIS data capture form
Format	Online form completion
Allocated to	MSDS Marine Project Manager (Alison James)

Quality criteria and method	Compliance with the archive repository guidance, internal review prior to submission.
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	October 2021

Product Number	11
Product Title	Archive Deposition
Purpose of Product	A digital archive will be deposited with ADS. This will ensure that the legacy of the project is held securely should there be future issues with the chosen host site.
Composition	Documentary and digital data complied to agreed standards.
Format	• Microsoft Word.doc • PDF • Spreadsheets as Microsoft Excel .xls files; • GIS data as ESRI shapefiles(.shp, .shx, .dbf etc.); georeferenced TIF images;
Allocated to	MSDS Marine Project Manager (Alison James)
Quality criteria and method	Compliance with the archive repository guidance, internal review prior to submission.
Person/group responsible for quality assurance	MSDS Marine Project Executive (Mark James)
Planned completion dates	October 2021

Annex F – Data Management Plan

Project Manager	Alison James
Project Number	HE Project number: 7982 MSDS Project number: MSDS19127
Project Name	*London* Protected Wreck Site: Tracked Diver Survey and Affiliated Volunteer Capacity Building
Author(s)	Alison James
Origination Date:	25/11/2020
Reviser(s)	None
Date of last revision:	None
Project stages covered:	4a – 4d
Version:	1
Status:	Draft
Summary of changes:	None
File Name/Location:	Z:\PROJECTS\HISTORIC ENGLAND\MSDS19127 London Diver Tracking and Affiliated Volunteer Capacity Building\4 GIS and Data
Related Policies:	• MSDS Marine Data Management Policy (2018) • ADAPt Project (Historic England project on Data Management) • Formal standards for data collection are referred to in the methodology section. Metadata standards are referred to below. The principle Metadata Standard in use is the MEDIN Discovery Metadata Standard. • Our data management plan is compliant will relevant legal requirements including IPR and GDPR.
Data Collection/Creation	

How data will be collected/created	Data will be stored on the MSDS Marine Server. The folder structure used by MSDS Marine follows the structure recommended by the Historic England ADAPt project, with main folders for:
	1. Help
	  a. Data Management Toolkit
	  b. MSDS Recording Guidance
	  c. MoRPHE
	  d. Project Management Toolkit
	  e. Project Procedures
	2. Project Management
	  a. Correspondence
	  b. Finance
	  c. Health and Safety
	  d. Logistics
	  e. Meetings
	  f. Project Proposal
	  g. Project Design
	  h. Staff Administration
	  i. Position Descriptions
	  ii. Training
	  i. Updated Project Design
	3. Resources
	  a. Background Research
	  b. Prior Data
	4. Investigation
	  a. Technique Material
	  i. Data
	  ii. Images
	  iii. Report
	5. Assessment
	  a. Technique Material
	  i. Data
	  ii. Images
	  iii. Report
	  1. Supporting products
	6. Analysis

	a. Technique Material i. Data ii. Images iii. Report 1. Supporting products 7. Dissemination a. Product i. Supporting products 8. Graphics 9. Archive Management File naming will also follow the recommendations of the ADAPt project, and will be structured as follows: Identifier-event-function-product-status-version. e.g.HE7892-London-SubBottom-DBA-Draft-v01.doc Quality assurance procedures will follow those set out within this tender.
Data to be Collected/Created	The data will be created and collected in a way which will allow it to be archived with the Historic England Archive, as specified in the tender brief. File formats will follow those specified (see table below). Where they have not been specified, Historic England will be consulted on preferred formats prior to data collection. However, in the interim, suggested formats have been identified on the basis of the MSDS Marine Data Management Policy (2018), and published advice from accredited Data Archive Centres (DACs) e.g. the ADS[17]. Formats have been chosen to facilitate long-term access to the data. Should alternative formats be required by Historic England, MSDS will endeavour to provide data in these formats. Existing data will be identified once the sites to be surveyed are known. This may include previous desk-based, geophysical or diver surveys for example. The table below gives examples of the type of data which may be collected as part of the project, dependant on the specific activities required. Data will be produced following the methods and guidance set out in this tender.

Data	Formats	Volume	Standards	Methods for collection	Archive
Digital images	Uncompressed Baseline TIFF; JPEG	1-20MB per image	Specific standards referred to in method statements. MEDIN discovery metadata standard	See Section 7.10	HEA

[17] http://archaeologydataservice.ac.uk/advice/FileFormatTable.xhtml

	Tracking data	TBC	TBC	Specific standards referred to in method statements. MEDIN discovery metadata standard	See Section 7.11	HEA
	Reports and text documents	Microsoft Word.doc; .and Portable Document Format .pdf	TBC	Specific standards referred to in method statements. MEDIN discovery metadata standard	See Section 7.6	HEA
	Spreadsheets	Microsoft Excel .xls	TBC	Specific standards referred to in method statements. MEDIN discovery metadata standard	Used as necessary	HEA
	GIS data	ESRI Shapefiles (.shp, .shx, .dbf etc.); georeferenced TIF images.	TBC	Specific standards referred to in method statements. MEDIN discovery metadata standard	See Section 7.11	HEA
Relations	Where data is derived in whole or in part from published or unpublished sources, whether printed or machine-readable, references to the original material will be given. Details of where the sources are held and how they are identified there (e.g. by accession number) will also be included. If the collection is derived from other sources we will indicate whether the data represent a complete or partial transcription/copy and the methodology used for its computerisation. We will clearly state whether the data represents a clear enhancement of this previous dataset.					
Documentation and Metadata						
Metadata	Many different metadata standards exist for heritage and the marine environment. The MEDIN discovery metadata standard is used by MSDS Marine and will be used as part of this Data Management Plan. This standard has been born from the GEMINI 2 standard, and is entirely compatible with other recognised standards such as ISO 19115, ISO 19139. It also meets the requirements of the EU INSPIRE Directive for metadata. The MEDIN discovery metadata standard has a number of advantages over other standards, in particular the provision of a marine thesaurus to facilitate standardisation. MIDAS Heritage also recommends the use of the UK GEMINI Discovery Metadata Standard (MIDAS Heritage 2012[18]). As the MEDIN					

[18] MIDAS Heritage, 2012. *The UK Historic Environment Data Standard.* Version 1.1. Available online at: https://historicengland.org.uk/images-books/publications/midas-heritage/midas-heritage-2012-v1_1/

	discovery metadata standard is compliant with the GEMINI Standard and others, use of this standard is compliant with both marine and heritage metadata standards and best practice.
Documentation	Documentation will be produced to accompany the data to help secondary users to understand and reuse the data. This will include the basic details that will help people to find the data, including who created or contributed to the data, its title, date of creation and under what conditions it can be accessed. Documentation will also include details on the methodology used, analytical and procedural information, definitions of variables, vocabularies, units of measurement, any assumptions made, and the format and file type of the data. Different information is required for each survey type, activity or product. This information will be captured using pre-existing forms which relate to the specific product or activity, and adhere to the metadata standard in use. As an example, metadata which is compliant with the MEDIN discovery metadata standard for a marine survey will include the following details: • Survey name • Survey abstract • Survey code • Originator • Owner • Survey start date • Survey end date • Spatial coordinate reference system • Position fix method and source • Horizontal positional accuracy • Depth coordinate reference system • Vertical positional accuracy • Platform type • Ship name • Cruise report reference • Project code
Ethical and Legal Compliance	
Data Security Issues	Any data security issues will be identified on a site-by-site basis, and thus they will be dependent upon the specific sites chosen for study. Following the identification of the specific sites data security issues will be considered.

	All work will be complaint with the EU General Data Protection Regulation (GDPR). Identity protection will be considered for any work requiring participants such as volunteer or engagement activities, for example by anonymisation. Consent will also be requested for the use of data relating to any work which requires volunteers or participants.
Intellectual Property Rights	The data and reports created by MSDS Marine under this contract will be Historic England Copyright. Copyright on all reports submitted will reside with Historic England, however a third-party in-perpetuity licence will automatically be given for reproduction of the works by the originator, subject to agreement in writing from Historic England.
Data Storage: Ensuring business continuity and archive security	
Storage and Backup	Data will be stored on the MSDS Marine server during the life of the project. This server is set to auto back up using a RAID system and also backs up nightly to a commercial Microsoft remote backup centre.
Access and Security	Access and security will differ on a site-by-site basis. There will be no restrictions on the use of any data produced by MSDS Marine after project completion. The MSDS Marine Server is secure and password protected. MSDS Marine employees are granted different levels of access to different areas dependant on their needs and on the security requirements associated with a project.
Selection and Preservation	
Preservation Plan	The physical archive, documentary and material, will be transfer to ADS on project completion. In addition, a copy of any digital files they wish to receive will also be transferred to them. The documentary archive will contain any hard copy data reports the repository wish to receive. The digital image and text archive will be archived with ADS. All other archiving decisions will be made in discussion with HE.
Data Sharing	
Data Sharing Plan	Data sharing and restrictions may differ on a site-by-site basis depending on the data used and parties involved. However, there will be no restrictions on the use of any data produced by MSDS Marine as part of this project after project completion. It is anticipated that the data generated from this project could be made publicly available through the digital repositories, however, this will be determined with HE at UPD stage. Awareness of the work will be raised through the proposed dissemination strategy. MSDS Marine understand that certain reports, elements of reports, or indeed fieldwork, may be considered sensitive and not for public dissemination. Prior to the undertaking of any works we will seek to establish any sensitivities with Historic England. Details of projects, reports and information will not be made public without prior consent. Where there may be a need to discuss sensitive elements of a project or report outside of the organisation, e.g. when talking to a licensed group or for obtaining additional data this will be discussed and agreed with Historic England in advance. Wherever external images, or material are obtained for reports or for the purposes of dissemination appropriate copyright permissions will be obtained. It is noted that reports may be reproduced online and copyright permissions for this purpose will be obtained. Where restrictions may apply Historic England will be made aware of these and alternatives suggested.

	Where material and information is obtained from external sources, be this written, photographic, data or verbal sources will be fully acknowledged and where appropriate permissions for reproduction obtained. Measures will be taken to limit the possibility of extraction of content, including Ordnance Survey (OS) and United Kingdom Hydrographic Office (UKHO) data, from documents intended for dissemination via the internet. This can include flattening the document, applying password security, the application of watermarks and reducing the resolution of images to a suitable level for display on a screen but too low for meaningful reproduction.
Data Sharing Restrictions	There will be no restrictions on the use of any data produced by MSDS Marine as part of this project after project completion. Third party data will only be shared if permitted by licence conditions.
Responsibilities and Resources	
Responsibilities	The Project Manager is responsible for ensuring the data management plan is followed.
Resources	Resources required to deliver this plan are covered by standard MSDS Marine resources and this tender. The archive will be deposited with Historic England, as required by the project brief.

Annex G - Diving Project Plan

7982: *London* Protected Wreck Site: Tracked Diver Survey & Affiliated Volunteer Capacity Building

DRAFT DIVING PROJECT PLAN for Historic England

MSDS Marine

December 2020

MSDS19127

London Protected Wreck Site: Tracked Diver Survey and Affiliated Volunteer Capacity Building

Draft Diving Project Plan

DOCUMENT CONTROL GRID	
Document Name	*London* Protected Wreck Site: Tracked Diver Survey and Affiliated Volunteer Capacity Building Draft Diving Project Plan
Client Project Number	7982
MSDS Marine Project Number	MSDS19127
Author and contact details	Mark James Mark@MSDSMarine.co.uk
Origination date	26/11/2020
Reviser (s)	
Date of last revision	
Quality Assurance Approval	Alison James
Version number:	1
Summary of changes	

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1.0 Project Details

1.1 The Diving Project Plan

1.1.1 This diving project plan has been complied by Mark James of MSDS Marine Ltd (MSDS Marine) to fulfil obligations under the Diving at Work Regulations 1997. Please note that this document pertains only to the diving element of the overall project, any reference to archaeological works is for the benefit of dive planning and risk assessment. The archaeological component of the project is discussed in the related Tender document.

1.1.2 This document is intended to be used in conjunction with the Hazard Identification and Risk Assessment document.

1.1.3 Please note this document is in draft form. It cannot be completed until fieldwork dates and dive vessels are confirmed.

1.2 Project Organiser

1.2.1 The project has been organised by MSDS Marine and is funded by Historic England. MSDS Marine are providing diving project management and are the Diving Contractor and will be referred to as such throughout this document. MSDS Marine will fulfil requirements under the Diving at Work Regulations 1997.

1.3 Location of Diving Project

1.3.1 The site is located at the following positions, all diving is expected to be undertaken within the boundaries of the stated positions.

Area 1		
WGS84		
	Latitude	Longitude
NW Point	51 29.7477	000 44.3802
NE Point	51 29.7435	000 44.4159
SE Point	51 29.7108	000 44.4046
SW Point	51 29.7155	000 44.3689

Area 2		
WGS84		
	Latitude	Longitude
NW Point	51 29.7622	000 43.9862
NE Point	51 29.7532	000 44.0506
SE Point	51 29.7244	000 44.0408
SW Point	51 29.7334	000 43.9764

2.0 PROJECT OUTLINE

2.1 Background to the Project

2.1.1 This project has been funded by Historic England.

2.1.2 This project will enable the team of affiliated volunteers working on the *London* protected wreck site to be embedded within the MSDS Marine HSE dive team to enable a tracked diver survey of the site. The Stage 3 multibeam bathymetry collected in May 2020 will form the base map for the diver tracked survey in this project. A specialist archaeologist from MSDS Marine will then work with the affiliated team of volunteers during the post-fieldwork recording process to digitise the existing site plan and to combine the multibeam bathymetry for the site with the existing site plan and dive track data. Training and equipment will be provided that will ensure the team of affiliated volunteers are able to maintain, and add to, the site records in future.

2.2 Nature of the Project

2.2.1 The project is the tracked diver survey of the wreck of the *London*. The *London* is designated under the Protection of Wrecks Act 1973 and is located in the Thames Estuary off Southend-on-Sea, Essex[1].

2.2.2 The project will use tracked diver survey to enhance the archaeological record. Divers will record the position of key points on the wreck and exposed artefacts to create a geo-referenced site plan that corresponds to the 2020 Multibeam bathymetry of the site.

2.3 Project Schedule

2.3.1 Diving operations will take place between INSERT and INSERT, times for diving will be dependent on the best diving conditions and will take into consideration, daylight hours, tide times and where practical weather to ensure the most effective use of time and resources. Diving conditions can vary, even locally, but it is likely that diving on the site will be largely restricted to the period around slack water.

2.3.2 All diving will be undertaken at periods of slow water. Slack water is anticipated to last approximately one hour;

Slack Water		
Date	Time	High or Low
Tbc	Tbc	Tbc

[1] https://historicengland.org.uk/listing/the-list/list-entry/1000088

2.4 Diving Environment

2.4.1 All diving will take place on sites one and two of the *London* Designated Wreck site which lies in the Thames Estuary, off Southend-on-Sea, close to the commercial shipping channel. The sites are subject to short slack water times, strong currents and poor visibility.

2.4.2 Visibility increases with the high water slack due to the influx of cleaner water. It is worth noting however that the site is within the limits of recreational diving and is regularly visited by recreational divers.

2.5 Dive Support Vessel

2.5.1 The Dive Support Vessel (DSV) will be *Wessex Explorer* chartered from Hayes Marine. The DSV is appropriately coded for the operation, holds the required level of insurance and is responsible for the general health and safety aboard. The DSV will provide marine crew and be familiar with undertaking diving operations of the nature specified for the project.

2.5.2 *Wessex Explorer* is an experienced DSV known to MSDS Marine and as such there are no concerns regarding the operation of capabilities of the vessel.

2.5.3 Where it is deemed by MSDS Marine that additional safety equipment will be required this will be taken on board, this can include but is not limited to; wet weather gear, oxygen, additional first aid supplies, additional communications such as hand-held VHF's, surface breathing apparatus and additional positioning equipment.

2.5.4 Dependant on the conditions, tasks and risk assessment, the DSV will anchor fore and aft (two, three or four-point mooring), anchor at the bow or stern independently or 'free boat' for certain SCUBA operations.

2.6 Levels of Experience

Core Members of the Professional Diving Team

2.6.1 All core members of the professional diving team are suitably qualified and experienced to undertake diving work under the Scientific and Archaeological Diving Projects Approved Code of Practise (ACoP). Adequate provision for the administration of first aid and oxygen will be made.

2.6.2 All members of the professional dive team will be qualified to a minimum of HSE SCUBA (or equivalent), hold an in-date and valid medical issued by an Approved Medical Examiner of Divers (AMED) and be fit to dive.

2.6.3 The diving supervisor for the project will be appointed in writing, any supervisor will fulfil the competencies laid out by the Scientific Diving Supervisory Committee (SDSC). This can be demonstrated through formal assessment (such as the SDSC or ADC supervisor exams), through demonstrable experience or a combination of both.

2.6.4 The competency of the diving supervisor to supervise the operation will be assessed. MSDS Marine's appointment in writing of the dive supervisor is confirmation of this assessment.

2.6.5 The core diving team is made up of professional divers, each with a wide range of experience and skills appropriate to the tasks.

Other Professional Diving Team Members

2.6.6 Other suitably qualified and experienced divers may join the professional team for all or parts of the project where additional support or expertise may be required. Where appropriate all divers in the water will be trained archaeologists or under the direct supervision of the core archaeological dive team.

Client Representatives

2.6.7 Should they meet the required criteria, client representatives will be able to join the professional dive team for all or part of a diving operation, dependant on qualifications. Where the client is also a diving contractor registered with the HSE, MSDS Marine will remain the diving contractor for the project, this will be confirmed in writing.

Responsibilities

2.7 Project Manager/ Site Manager

2.7.1 The Project Manager (PM) is responsible for the overall safety and success of the project. As the most senior representative of MSDS Marine, they will ensure that the company's project and operation procedures are followed at all times. The Diving team will regard the MSDS Marine PM as the first point of contact for all diving operations. The PM may veto any activities for any reason, at any time. (This role maybe carried out by the diving supervisor if only one diving team is on site).

2.8 Client Representative

2.8.1 The client representative (where present) is responsible for ensuring that all planned diving activities can be carried out within the MSDS Marine diving procedures. The client representative will communicate with the Site Manager (PM) with regards to scheduling, scope of work and safety on the project, where required on a daily basis. The client representative may also veto any activities offshore for any reason, at any time.

2.9 Vessel Master

2.9.1 The Vessel Master is responsible for ensuring the integrity and seaworthiness of his vessel throughout all phases of the project. The Vessel Master has a responsibility for the safety of the marine crew, project team and any small vessel or daughter craft using his vessel as a safe haven. The Vessel Master may veto any activities offshore for any reason, at any time. The Vessel Master should be competent to operate the category of vessel being used and will be required to hold the relevant class certificates required to skipper a vessel of that class.

2.10 Diving Supervisor

2.10.1 The Diving Supervisor is responsible for ensuring that all parts of this procedure are followed safely and adhered to in line the clients' procedures. The Diving Supervisor will report directly

to the PM. In the event of no onsite PM the Diving Supervisor will assume the role. The Diving Supervisor is the only person who can start a diving operation.

2.11 Diver

2.11.1 The Diver shall follow the direction of the Diving Supervisor only, and adhere to procedures covering the work scope that he is undertaking. They are responsible for their own safety and those around them. It is the diver's responsibility to attend Tool Box Talks at the start of every shift or any time the task changes. The diver should ensure that they fully understand the tasks required and if in doubt should consult their Diving Supervisor for further guidance.

2.12 Dive Technician

2.12.1 The Dive Technician will ensure that the dive systems are maintained in-line with HSE guidelines and manufacturers specifications. Where the Dive Technician is not present on site, they will ensure that all equipment mobilised for the job is supplied in a tested and working order with the correct accompanying paperwork.

2.13 All Personnel

2.13.1 Every employee, including contract personnel, subcontractors and avocational divers, have a legal obligation to co-operate with the company to ensure that the Company Policies are adhered to.

2.13.2 It is the responsibility of each individual to ensure that their acts or omissions do not put the health and safety of themselves or others at risk. All employees, sub-contractors and avocational persons must co-operate with their Supervisor in all matters concerning health, safety and environmental issues. It is the duty of all employees, sub-contractors and avocational persons to report all health, safety and environmental hazards or unsafe acts they have encountered or witnessed during their work activities as soon as possible.

2.13.3 All employees, sub-contractors and avocational persons must ensure they are aware of any project specific procedures issued for any contract.

2.13.4 All employees, sub-contractors and volunteers shall participate in Level 2 Risk Assessments and tool-box talks as appropriate. Personal Protective Equipment (PPE) is issued by MSDS Marine for individual's use. It is the responsibility of the individual to ensure they utilise the correct PPE in the correct manner when carrying out their activities and that the PPE is correctly maintained.

2.13.5 Any equipment or tooling utilised to carry out any task must be used in accordance with its operating instructions to ensure safe working conditions.

3.0 Diving Method

3.1 Introduction

3.1.1 Diving activities within the scope this project will conform to the Diving at Work Regulations 1997 (DWR 1997), and will follow the best practise laid out in the Scientific and Archaeological Diving Projects ACoP. The ACoP provides for the use of SCUBA for diving operations. All potential risks will be mitigated through the use of risk assessments before any diving commences, risk assessments are contained within the MSDS Marine Hazard Identification and Risk Assessment (HIRA) document. A copy of the DWR 1997 and the Scientific and Archaeological Diving Projects ACoP is held by the diving contractor and can be made available to view; a copy will be made available on the DSV.

3.1.2 All diving operations must be conducted in accordance with the procedures and practises laid down in the MSDS Marine Diving Operations Manual under the control and responsibility of the diving supervisor.

3.1.3 This Project Plan pertains to SCUBA operations.

3.2 Medical Fitness

3.2.1 All professional divers will have a current certificate of medical fitness to dive, issued by an HSE Approved Medical Examiner of Divers (AMED), a copy of divers' medicals will be kept on file. Where a diving medical has been obtained outside of the United Kingdom this must be recognised by the HSE.

3.2.2 All avocational divers, who are not 'at work' will provide a medical certificate or self-certification in line with their qualifying body, a copy of which will be kept on file.

3.3 SCUBA Operations

SCUBA Equipment and Breathing gases

3.3.1 All professional SCUBA operations will be conducted using Open Circuit SCUBA equipment to the following specification;

- A minimum of 15 litre 232 bar back-mounted primary gas supply
- A minimum of 3 litre 300 bar back-mounted bailout gas supply
- Appropriate primary/bailout gas switching mechanism
- OTS Guardian Full Face Mask
- Alternative air source in the form of an 'octopus'
- Through water communications with recording facility

3.3.2 All divers will carry the appropriate safety equipment for the dive, this will include, but is not limited to;

- Knife
- Reel
- Delayed Surface Marker Buoy (DSMB)
- Buddy line should conditions dictate a need
- Bottom timer
- Depth gauge
- Contents gauge
- Torch
- Spare half mask

3.3.3 All divers will be wearing appropriate environmental protection in the form of drysuits.

3.3.4 All members of the professional team will be using equipment maintained to a minimum of manufacturer specifications. No team member is to modify or alter any equipment used by the professional team without the permission of the diving supervisor. Service records for the SCUBA equipment will be held on the vessel.

3.3.5 All cylinders will be steel or aluminium; these will be tested in accordance with the standards set out in BS EN 1968:2002 (steel) and BS EN 1802:2002. Compressed air will be obtained through a trusted independent supplier. Where air is from a compressor on site it will be maintained to the manufacturers specifications and will be tested prior to each session to ensure air conforms to the EN12012 standard for breathing air.

3.3.6 All SCUBA dives will be undertaken on Air.

Gas Calculations

3.3.7 The following section presents the gas calculations for the intended dives.

3.3.8 As with all SCUBA operations two factors will determine the bottom time of the diver, the amount of gas carried and consumed, and the decompression schedule for the depth at which they are at. No dives will be planned that put the diver into the 'In-Water Air/O^2 Decompression or SurDO^2 Recommended' category of the U.S. Navy Diving Manual Rev. 7 tables.

3.3.9 Dives will be planned by the diving supervisor based on the gas mix and depth, the following are provided as examples based on expected depths and diving on air.

Gas Mix of Air, working depth no deeper than 60fsw / 18.2m		
Bottom Time	**Required Stops**	**Total Ascent Time**
63 minutes	0	2:00 minutes:secs
65 minutes	2 minutes @ 20fsw / 6.1m	4:00 minutes:secs
70 minutes	7 minutes @ 20fsw / 6.1m	9:00 minutes:secs
Gas Mix of Air, working depth no deeper than 70fsw / 21.3m		
Bottom Time	**Required Stops**	**Total Ascent Time**
48 minutes	0	2:20 minutes:secs
50 minutes	2 minutes @ 20fsw / 6.1m	4:20 minutes:secs
55 minutes	9 minutes @ 20fsw / 6.1m	11:20 minutes:secs

3.3.10 **Primary gas supply volumes** - Based on the ADC breathing of 40 litres per minute (lpm) and a depth of 20m, and not taking into consideration the reduction in pressure (and therefore consumption) during the ascent, nor the likely differences in actual breathing rates (which tend to be less), the estimated capacity of the following cylinders will be used for planning;

- 15 litre @ 230bar 3,270 litres = 27 minutes
- 2 x 12 litre @ 230bar 5,232 litre - 44 minutes

3.3.11 **Ascent gas requirements on primary supply -** Based on the use of a 15-litre primary supply, ascent from 20m and a breathing rate of 40 lpm the following calculation estimates the required pressure remaining in the divers primary gas supply in order to reach surface safely and undertake a 2 minute stop at 20 fsw / 6.1m (calculated @ 10m).

- Total available gas in primary supply @ 230 bar 3,270 litres
- Gas requirement to ascend from 20m 240 litres
- Gas requirement to undertake a 2 minute stop 160 litres
- Total ascent gas requirement 400 litres
- Total gas requirement in bar based on 15 litre 27 bar

3.3.12 To ensure contingency divers must leave bottom (not withstanding decompression schedules to leave earlier) with a primary gas supply of at least 50 bar.

3.3.13 **Bailout gas supply volumes -** Based on the HSE bailout breathing rate of 62 lpm which takes into consideration an increase in breathing rate due to stress, exertion, etc. where a diver may be required to use their bailout supply. Calculations are based on a depth of 20m, but not taking into consideration the reduction in pressure (and therefore consumption) during the ascent, nor the likely differences in actual breathing rates (which tend to be less and will decrease as stress decreases). The estimated capacity of the following cylinders will be used for planning;

- 3 litre @ 200bar 570 litres = 3 minutes
- 3 litre @ 275bar 795 litres = 4 minutes

3.3.14 Given the minimum ascent time of 2 minutes, a 3-litre bailout (@ 275 bar) will be used by each diver. To reduce burden on the diver with weight of equipment used, but also to ensure adequate bailout capacity a further calculation is presented below to determine gas quantities available for stops at 20 fsw / 6.1m. Gas requirements for the ascent are calculated at a breathing rate of 62 lpm @ 20m and gas requirements for the stops are calculated at a breathing rate of 62 lpm @ 10m

- Total gas available from 11 litre @ 200 bar 795 litres
- Gas requirement for ascent 2 minutes @ 20m 372 litres
- Gas remaining for stops 423 litres
- Time available for 20 fsw / 6.1m stops 3.4 minutes
- Maximum ascent time from 20m with 20 fsw / 6.1m stops 5.4 minutes

Group Structure Professional SCUBA Divers

3.3.15 The professional divers will be under the direction of the diving supervisor. Divers will work as buddy pairs and act as in water standbys for each other. There will be no more than four divers in the water at any one time, the number of divers in the water will be dictated by the conditions encountered following the daily risk assessment.

3.3.16 Surface cover will be provided by members of the professional team, or other suitably competent persons familiar with the project plan and who will be able to obtain assistance in the event of an emergency. There will be a designated surface recovery person on deck at all times who will be able to help with recovery of the divers onto the boat in the event of any divers encountering difficulties.

3.3.17 Any issues between any of the members of the group should be brought to the attention of the diving supervisor immediately.

3.3.18 The professional dive team structure is shown below;

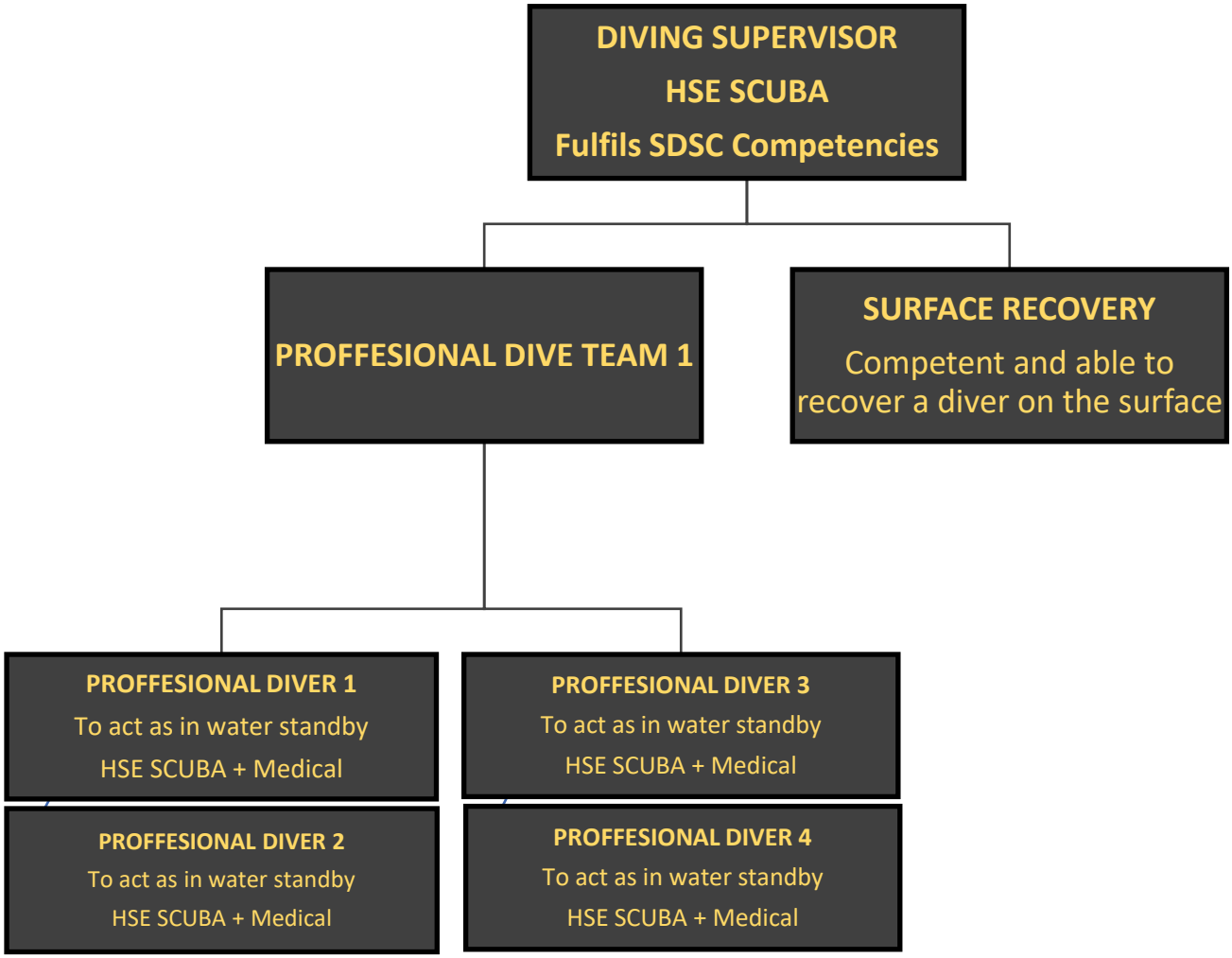

Figure 1: Professional dive team Group Structure

4.0 DIVING RULES

4.1 Diving Procedures

4.1.1 All diving to be carried out strictly in accordance with Health and Safety section of this method statement and the Risk Assessment for the site.

4.1.2 No diving to take place without a permit to dive form being completed.

4.1.3 No divers/employees of MSDS Marine, both permanent and freelance, are to divulge any information on the site to either the client, press or general public, this includes social media. All reports on diving and site progress etc. are to be made by the Diving Supervisor, MSDS Marine and the Client.

4.1.4 All divers are to hold a current HSE recognised medical diving certificate and HSE recognised Diver training.

4.1.5 An international code flag alpha (A Flag) to be clearly displayed to warn other waterborne vessels of the diving operation (any other local warning signs/flags shall also be put on display if required). This should also include the vessel displaying the day shape of ball-diamond-ball for daylight operations and the navigation lights of red-white-red as per the Merchant Shipping Regulations.

4.1.6 A supervisor's daily log will record the diving team activities and a diving log shall record all individual diving operations.

4.1.7 All divers are to keep an up to date Divers Logbook, these are to be completed daily. the NAS may check these at regular intervals.

4.1.8 The diving supervisor is to ensure that the divers have a safe means of entering and leaving the water including the recovery of an unconscious diver. Additional recovery methods should be available as back up.

4.1.9 The diving supervisor is responsible for ensuring that all relevant persons, including harbour masters, vessel masters, site managers are notified on a daily basis of the diving operations.

4.1.10 The diving supervisor is also responsible for;

- The checking of plant and equipment
- The allocation of personnel and responsibilities and ensuring personnel are aware and understand
- Selection of equipment for task in hand
- Fitness of divers for underwater work and specific tasks
- Arrangement of signalling procedures
- Precautions against cold/heat both on surface and underwater

- Precautions against underwater hazards

4.1.11 All diving to be carried out on the latest version of U.S. Navy air diving tables, currently Revision 7. Where Nitrox is used all dives will be planned and conducted using an Equivalent Air Depth (EAD). Note: It is not anticipated that Nitrox will be used during this project.

4.1.12 No diver is to spend more than the HSE maximum recommended bottom time limitation working underwater for the given depth. See HSE Diving Information Sheet No. 5 'Exposure limits for air diving operations'. DIS No.5 - http://www.hse.gov.uk/pubns/dvis5.pdf. If a nitrox breathing mixture is being used, you can find out the maximum exposure by entering the equivalent air depth (EAD) of the maximum dive depth.

4.1.13 Personnel are to be made aware of the potential hazards identified in the site-specific Risk Assessment.

4.1.14 In the event of a diving emergency, see Sections 4 and 5 of the Diving Operations Manual and Section 7 of this document for the recompression chamber facilities and other first aid procedures.

4.1.15 No diving is permitted during the hours of darkness unless adequate lighting is supplied and permission is sought from Mark James (07917 703176).

4.1.16 Team sizes;

- The minimum dive team for SCUBA advised by the HSE Inland and Inshore ACOP is four people, (Diving Supervisor, working diver, standby diver and tender).

- The guideline team sizes for benign conditions are three for SCUBA but these team sizes will rarely be used.

- Minimum team sizes will rarely be used, each dive site will be individually risk assessed and appropriate team sizes will be used.

- Additional team members may/will be required if other tasks are required to assist the dive team's operational tasks.

- On SCUBA, a maximum of four divers to be diving at one time (subject to daily risk assessment), except in an emergency.

- Additional divers may dive alongside the working divers but will be controlled from another diving operation. This will need to be coordinated with the diving supervisors.

4.1.17 In water decompression may be utilised. However, there will be a planned limit of a maximum of 20 minutes' decompression. No decompression diving will plan to result in exceptional exposure in reference to the U.S. Navy Diving manual.

4.1.18 No diving will take place deeper than 50 meters, except in the case of an extreme emergency.

4.1.19 No personnel are to modify or alter any equipment without the permission of the diving supervisor.

4.1.20 Mobile phones shall not to be used by members of the dive team, whilst operating plant or whilst any diver is underwater unless it is for emergency purposes.

4.1.21 Each member of the team has a responsibility to himself and the other members of the team to ensure that the following basic duties are carried out safely and without risk to health.

- The Supervisor(s): The supervisor shall ensure that the members of the diving team are aware of their duties.

- The Diver(s): The diver(s) shall not enter the water without first checking the readiness of his tender and standby.

- The Standby Diver(s): The standby diver should be fully dressed in with his bailout cylinder on and with his diving helmet immediately to hand ready to provide assistance to a diver in the water. During SCUBA operations the standby can be 'in-water'.

- The supervisor to get a current weather forecast and monitor weather changes throughout the day.

4.1.22 A pre-dive checklist to check all equipment is in place, serviceable, in test and its certificate is on site, prior to each day's diving operations commencing.

4.1.23 The supervisor to ensure sufficient HP nitrox / air is in place to carry out the dive and for the standby diver to recover the diver. This includes their independent secondary supplies.

4.1.24 Small vessels for crew transfers may come along side at the discretion of the Dive Supervisor and Vessel Master.

4.1.25 The supervisor is to monitor noise and vibration exposure for the dive team and make sure no over exposure to either can take place.

4.1.26 Diving to stop if external site noise retracts from the supervisor's ability to hear the diver's communications.

4.1.27 No person is allowed on site under the influence of drink or drugs. Drinking out of work hours may have an effect the following day so should be limited at all times.

4.1.28 No person to work on site if unduly tired. Supervisor to monitor shift patterns and ensure 8 hours' clear sleep is available each evening. Travel time and meal availability to also be taken into consideration.

4.1.29 Divers will have a rest day from diving approximately every fifth day subject to monitoring dives times and shift patterns by the dive supervisor. They may carry out other non-diving duties like

acting as tenders, winch operators etc. This is in order to avoid the risk of a nitrogen build up, and with fatigue, that might lead to a DCI incident.

4.1.30 Divers are not to enter the water unless they are fully conversant of the dive, the task in hand and are fully happy to undertake the dive.

4.1.31 Divers to inform the supervisor if they feel unwell or know of any medical, mental or physical reasons that they should not dive.

4.1.32 The diving equipment used should be suitable for the task, with helmets being used if there is a risk of head knocks, contamination, through water noise or extreme cold.

4.1.33 Any site plant or tools used should be suitable and safe to use and only operated by suitably trained and/or experienced personnel.

4.1.34 Dive equipment to be thoroughly cleaned and correctly stowed on completion of each dive or the end of the day of diving.

4.1.35 Skylarking and playing pranks is strictly prohibited on site.

4.1.36 Diving in poor surface visibility needs to be assessed to ensure that vessel collision (between the dive vessel and any other vessel operating in or near the worksite) or lost diver is not an increased risk.

4.1.37 Dives are to be aborted in lost communications situations, diving to line signals alone are not to take place.

4.1.38 Divers to carry a sharp knife on all dives.

4.1.39 Tenders to tend surface fed umbilical's, or lifelines, at all times that divers are in the water.

4.1.40 Bailout bottles to be charged and of suitable capacity to allow for the safe ascent of the diver to the surface, to include any mandatory safety stops and the ability to maintain buoyancy at the surface.

4.1.41 Where the depth of the dive may preclude the carrying of a sufficient sized bailout the bailout must be of sufficient volume to enable the diver to return to a safe haven, e.g. a basket or wet bell. The safe have will be fitted with a 50 litre cylinder of air per diver with both a demand valve and an open ended tube fitted. It is imperative that the safe haven will be able to be recovered to the surface with the divers and the 50 litre cylinders.

4.2 Aborting the Dive

4.2.1 The diving supervisor, the vessel skipper or any member of the dive team can abort the dive for any reason that affects the safety or the wellbeing of the divers, this can include but is not limited to;

- Faulty/ill-fitting equipment
- Poor weather

- Poor sea state
- Poor visibility
- Illness (including equalisation problems)
- Tiredness
- Drop in body temperature

4.2.2 Every diver will be adequately trained in reasons to abort a dive through their qualifying body, and their guidelines should be followed at all times. Dive team members must notify the diving supervisor immediately if they fall unwell or know of any reason why they cannot dive.

4.2.3 If a dive is to be aborted prior to entering the water, the person wishing to abort the dive must make the diving supervisor aware and explain their reasons, the diving supervisor will do everything possible to remedy the problem. If a solution cannot be determined to the agreement of all concerned then the dive will be aborted.

4.2.4 If a SCUBA dive is to be aborted whilst in the water the buddy pair must ascend together in a safe manner.

- A request to ascend is not negotiable all divers must respect the wishes of their buddy
- Under no circumstances is a diver to be left on the sea bed, each diving pair must exit the water together.

4.3 SCUBA Procedure

SCUBA Definition

4.3.1 SCUBA refers to Self-Contained Underwater Breathing Apparatus and as the name suggests means that all air supplies are carried by the diver, including their reserve/bailout gas.

4.3.2 The use of SCUBA has its limitation in the commercial environment, however with appropriate management is an effective method of working to complete certain tasks. Due to the finite amount of gas a diver can carry it is not suitable where there is a risk of entrapment (though the environment, the trapping under a failed lift, etc.), where the task is particularly arduous leading to an increase in breathing rate or where the diver requires greater protection in the form of a helmet rather than a Full Face Mask (FFM).

4.3.3 Where the diver is required to travel freely around the site, for example during orientation or investigative dives, the absence of a heavy umbilical and helmet can aid the diver and reduce the risk of a snagged or damaged umbilical.

4.3.4 A diver operating on SCUBA is able to enter and exit the water quicker and is affected to a lesser degree by the rise and fall of the basket through the surf zone, although exit via the ladder must

be considered. During ascent and descent, the diver is impacted less by drag on the umbilical. However, whilst the diver can work in up to 0.8 knots they must be clear of the water above this speed as there is not the safety of the cage during traveling.

4.3.5 When SCUBA diving the divers are in-water standbys for each other, and both must maintain a permanent link to either the vessel or the downline. The divers will maintain visual contact with each other whilst working, noting that FFM mounted lights can help.

4.3.6 All SCUBA diving will use voice communications between each other and the surface, there are no exceptions to this and in the event of a communications failure both divers must return to the surface. Both divers are responsible for monitoring their own air supply and depth, both of which will be reported back to the supervisor. The supervisor will ask for an air and depth check at regular intervals, the frequency dependant on the depth of the dive and the breathing rate of the diver.

Description

4.3.7 Generally, the divers will leave the vessel using a giant stride from the side or the stern of the vessel and descend down the downline, exit will be up the downline via a ladder or via a dive lift.

4.3.8 Prior to entry and following exit the divers will be assisted in kitting up and de-kitting by their tenders and equipment and air checks will be undertaken either by the supervisor or a nominated contact. Equipment and air checks will be recorded on the appropriate form.

Gas Supplies

4.3.9 Bail out – Divers will carry enough bailout gas to safely reach the surface and have adequate air to maintain positive buoyancy on the surface at a breathing rate of 62 litres/minute. Unless near the downline the diver will ascend on a Delayed Surface Marker Buoy (DSMB) to reduce the amount of time prior to leaving bottom. Calculations are contained within the diving project plan.

Operation overview

4.3.10 Before each dive the diving equipment will be checked as well as air quantities. The entry and exit points will be clear of obstructions and hazards and the ladder will be deployed.

4.3.11 Prior to diving, the divers are helped into their equipment and supported during their transition from the bench to the point of entry. Deck crew should wear appropriate PPE, to include a life-jackets. The divers will not enter the water until all members of the diving team are ready and the dive supervisor has instructed them to do so.

4.3.12 Once the divers are at depth they will report to the supervisor their depth and air. Following the report, the divers will use a reel to travel to the work site where they will remain attached to the reel at all times.

4.3.13 At the end of the dive the divers will return to the downline. When both divers are ready to leave bottom, they will inform the supervisor who will advise if decompression is required, otherwise they will surface and exit via the ladder. Should decompression stops be required

the divers will report to the supervisor who will advise on the time at stop required and notify when the stop can be left.

Moving the vessel

4.3.14 It is not envisaged that the vessel will have to move off anchor whist divers are on the worksite, except when free-boating as is typical with SCUBA operations.

5.0 Emergency Procedures

5.0.1 Whilst contingencies have been considered in the design and preparation of equipment, certain inconceivable situations could occur. These procedures have been written to cover the possibility of an emergency which is by nature unexpected and differs from a routine failure in that it requires prompt corrective action to recover and prevent further deterioration of the situation. For an individual to respond correctly to an emergency, the action required must be thoroughly known and understood.

5.0.2 The cardinal rule of emergency procedures is the most difficult to follow "DON'T PANIC". While actions taken in an emergency must be quick, they must also be correct and correct decisions are not made if you do not have a complete grasp of the situation. If a Diver finds himself in an emergency situation, he should take time to assess the situation, determine the correct action and what he can do to help himself; whilst still giving the surface a clear concise report of his status as conditions allow.

5.0.3 It is important for the Diving Supervisor to have all the facts available so that the situation can be handled with the full support of the topside crew. This will automatically give confidence to the Diver in the compromised situation.

5.0.4 Note: dependant of the diving method employed not all steps will be relevant to every operation but all procedures are retained for completeness. The overarching procedures are relevant for both SSDE and SCUBA and each step should be applied as appropriate to the method used.

5.1 Fire or Smoke Hazard on Deck

FIRE OR SMOKE HAZARD ON DECK		
Step	Description of Task	Action By
1	Inform the Diver.	Diving Supervisor
2	Switch to passive secondary supply.	Diving Supervisor
3	Alert the Standby Diver (also breathing from a passive secondary supply independent of the Divers).	Diving Supervisor
4	Return to the downline / basket / wet bell.	Diver
5	Dive control to emergency power. BA sets made ready.	Tenders/ Diving Supervisor
6	Terminate dive.	Diving Supervisor
7	DDC to passive gas – as dictated by decompression profile.	Diving Supervisor

5.2 Loss of Communication

LOSS OF COMMUNICATION		
Step	Description of Task	Action By
1	Repeated flashing of the hat mounted lamp.	Diving Supervisor
2	Attempt to establish line pull status.	Tender
3	Alert the Standby Diver (if no Diver 2).	Diving Supervisor
4	Return to downline / basket / wet bell and await the Standby Diver / Diver 2.	Diver
5	Deploy the Standby Diver / or advice Diver 2 to establish visual contact with the Diver.	Diving Supervisor
6	Assess the situation and report to the Diving Supervisor.	Diver 2/ Standby Diver
7	Terminate the dive and recover the Divers to the surface following normal decompression procedures. Ascent and stops are to be controlled through the Standby Diver / Diver 2 communications.	Diving Supervisor

5.3 Loss or Contamination of Breathing Gas

LOSS OR CONTAMINATION OF BREATHING GAS		
Step	Description of Task	Action By
1	Switch to secondary supply.	Diving Supervisor
2	If necessarily go on to bail-out.	Diver
3	Alert Standby Diver.	Diving Supervisor
4	Air to Divers pneumo (if required).	Diving Supervisor
5	Insert pneumo into Divers helmet (if required).	Diver
6	Return to downline / basket / wet bell.	Diver
7	Deploy Standby Diver to assist as required.	Diving Supervisor
8	Terminate dive following normal decompression procedures except where Steps 2, 5 and 6 are initiated.	Diving Supervisor
⚠	**NOTE. Steps 2, 5 and 6 should only be considered in the event of a secondary passive gas supply failure**	

5.4 Secondary Recovery

Diving from a Basket

SECONDARY RECOVERY – DIVING FROM A BASKET	
Step	**Description of Task**
1	For deployment in this mode, a basket will be provided to lower the Diver(s) to a position as close as possible to or adjacent to the worksite.
⚠	**The Standby Diver should be provided with a dedicated, duplicate system to that of the Working Divers, or the Standby Diver will have adequate umbilical in order to reach the Working Divers. Steps 2 and 3 must be replicated for all deployment systems.**
2	The system will be fully certified with onsite load test and required back up certification and be equipped with a 50-litre air cylinder fitted with a first stage reducer, contents gauge, demand valve and spider whip with ¼" turn valve.
3	A secondary means of recovery must be provided by means of a clump weight/guide wire system.

Diving from a Wet Bell

SECONDARY RECOVERY – DIVING FROM A WET BELL	
Step	**Description of Task**
1	The wet bell will be fully equipped with on-board gas supplies independently manifolded to each diver and capable of evacuating the dome.
2	Each Diver will have an independent gas supply from the surface.
3	A third supply from the surface will act as a further supply to each Diver (via a manifold) and be capable of evacuating the dome so that it may be used as a refuge in the case of an emergency.
4 ⚠	A secondary means of recovery from the system must be provided. **This may be in the form of a clump weight/guide wire system.** Lights and communications will be provided.

5.5 Fouled or Entrapped Diver

FOULED OR ENTRAPPED DIVER		
Step	**Description of Task**	**Action By**
1	Do not panic or ditch equipment.	Diver
2	Inform surface and explain the situation and any equipment needs or assistance required.	Diver/ Diving Supervisor
3	Alert the Standby Diver.	Diving Supervisor
5	Diver to attempt to free from fouling.	Diver
6	Deploy Standby Diver as required.	Diving Supervisor
7	When the Diver is clear the dive may be terminated dependant on the cause and situation.	Diving Supervisor

5.6 Injured Diver in Water

INJURED DIVER IN WATER		
Step	**Description of Task**	**Action By**
1	Inform surface.	Diver
2	Alert Standby Diver and Diver Medic.	Diving Supervisor
3	Determine nature and extent of injury.	Diver/ Diving Supervisor
4	If required deploy the Standby Diver to assist the Diver.	Diving Supervisor
5	Assess the situation and evaluate injury. Communicate with Diver medic.	Standby/ Diver Diving Supervisor
6	Standby Diver to remain with the Diver. Return to downline / basket / wet bell and commence recovery / decompression. **Do not omit decompression except where the severity of the injury dictates greater risk than by doing so.**	Standby/ Diver Diving Supervisor
7	Administer first aid and request medical assistance as required (including hyperbaric if necessary).	Diver Medic/ Diving Supervisor

5.7 Damaged Umbilical

DAMAGED UMBILICAL		
Step	**Description of Task**	**Action By**
1	Go on to bail-out.	Diver
2	Alert Standby Diver.	Diving Supervisor
3	Air to Divers pneumo (if required).	Diving Supervisor
4	Insert pneumo into Divers helmet (if required).	Diver
5	Return to downline / basket / wet bell.	Diver
6	The Diving Supervisor will instruct the Standby Diver to deploy to the Diver to assist as necessary	Diving Supervisor
7	Air to Standby Divers pneumo (as requested).	Diving Supervisor
8	Terminate dive following normal decompression procedures including any in water decompression stops unless surface supply has failed and Diver on Bail-out. In this scenario the Diver to be recovered without delay and consideration for surface treatment to be reviewed with the **Company Diving Medical Advisors**.	Diving Supervisor

5.8 Severed Umbilical

SEVERED UMBILICAL		
Step	**Description of Task**	**Action By**
1	Go on to bail-out.	Diver
2	Alert Standby Diver.	Diving Supervisor
3	Return to downline / basket / wet bell. **Activate on-board gas supply, i.e. purge dome (wet bell).**	Diver
4	The Diving Supervisor will instruct the Standby Diver to deploy to the Diver.	Diving Supervisor
5	Air to Standby Divers pneumo (as requested).	Diving Supervisor
	NOTE. If a second Standby Divers rig is available and 'online' consideration should be given to deploying it with the Standby Diver.	

5.9 Emergency or Unintentional Ascent

EMERGENCY OR UNINTENTIONAL ASCENT		
Step	**Description of Task**	**Action By**
1	Exhale all the way to the surface.	Diver
2	Recover umbilical as quickly as possible.	Tender
3	Remove the Diver from the water.	Tender
4	Recompress the Diver to equivalent working depth in chamber and allow to stabilise for 10 minutes.	Diving Supervisor
⚠	**If AGE is suspected recompress to 30m with Tender present. Carry out neuro/physiological checks and decompress on Comex 30 (gas embolism treatment).**	

5.10 Omitted Decompression

5.10.1 The following scenarios represent omitted or compromised decompression:

- Omitted decompression stop(s);
- Insufficient time spent at decompression stop(s);
- Over running the 5-minute surface interval (time from last water stop to 12m chamber stop breathing O2);
- Having to abort in-water decompression for any reason.

⚠ **Should a mistake in a Divers decompression profile become evident during the Divers decompression the Diver(s) should be switched immediately to USN Table 5 to be carried out in the surface DDC.**

Mistakes becoming apparent after the Diver(s) have completed decompression should be referred to the Company Medical Advisor for advice.

OMITTED DECOMPRESSION		
Step	**Description of Task**	**Action By**
1	Recompress the Diver(s) immediately to appropriate depth using USN Table 7.	Diving Supervisor
2	If no symptoms of DCI or barotrauma are present decompress in accordance with USN Table 7.	Diving Supervisor
3 ⚠	Any symptoms of DCI or barotrauma or recurrence should be treated by switching to the appropriate treatment table. **This should be reported to the Company Medical Advisor immediately to seek advice.**	Diving Supervisor

5.11 Recovery of an Unconscious Diver

RECOVERY OF AN UNCONSCIOUS DIVER		
Step	**Description of Task**	**Action By**
1	No contact with the Diver despite attempting to attract attention with light / line pull signals etc.	Diving Supervisor Tender
2	Switch to secondary passive air supply monitoring the line pressure for any obvious signs of pressure loss.	Diving Supervisor
3	The Diving Supervisor will instruct the Standby Diver to deploy to the Diver.	Diving Supervisor
4	Standby Diver to accurately assess the situation and report to the Diving Supervisor.	Standby Diver
5	Standby Diver to open the Divers free flow (if unconscious).	Standby Diver
6	Slack both Divers umbilical's to be taken up and deck crew to be made ready to assist in bringing both Divers to the surface.	Standby Diver/ Diving Supervisor
7	Diver deployment / recovery basket made ready at suitable depth to enable safe recovery to deck.	Winch Operator
8	On arrival at the basket the Standby Diver will: 1. Place the unconscious Diver in the recovery basket; 2. Attach a security lanyard to the unconscious Divers harness; Once these steps are confirmed to the Diving Supervisor recovery to the surface will commence.	Standby Diver/ Diving Supervisor
9	Standby Diver will accompany the Diver to the surface and deck at the required ascent rate ignoring any in water stops. The Divers condition should be monitored throughout.	Standby Diver/ Diving Supervisor/ Tender
10	The unconscious Diver and a Tender (and if necessary only the Standby Diver) to be recompressed in the DDC to 18m for a USN Table 6. Establish the Divers vital signs (assuming the worst-case scenario of a non-breathing unconscious patient). The cause of the Diver becoming unconscious should be established if possible and communicated to the Company Diving Medical Advisor. **The Company Medical Advisor should be contacted immediately and advice sought.**	Diving Supervisor/ Diver Medic
11	After the patient's condition has been stabilised a decision will be made whether to continue with a USN table 6 or switch to an alternative treatment. **This should be carried out in liaison with the Company Medical Advisor.**	Diving Supervisor/ Diver Medic

5.12 Oxygen Toxicity

OXYGEN TOXICITY		
Step	Description of Task	Action By
1	When using an oxygen enriched breathing gas (Nitrox) mixture the risk of oxygen toxicity is increased due to the higher PPO_2 level in the breathing mix. In the event that oxygen toxicity is suspected, which will be indicated by the Divers response or actions, the Diving Supervisor will immediately switch the primary breathing gas from Nitrox to air.	Diving Supervisor
2	The Diving Supervisor will instruct the Standby Diver to deploy to the Diver.	Diving Supervisor/ Tender/ Standby Diver
3	When the Standby Diver locates the Diver, he will open the Divers free-flow and purge the line and helmet of Nitrox.	Standby Diver
4	If the Diver responds to the Supervisor prior to the Standby Diver arriving the Supervisor will instruct the Diver to open the valve and flush his supply to lower his PPO_2.	Diving Supervisor/ Diver
5	The Standby Diver will assess the condition of the Diver and report to the Supervisor.	Standby Diver
6	The Diver and Standby Diver will be recovered to surface. The condition of the Diver shall be monitored throughout. **In the event that this procedure is applied the dive profile must be reverted to the actual depth and time not the EAD which may result in the Diver exceeding the maximum bottom time.**	Standby Diver/ Diving Supervisor
7	The Diver shall be assessed by the Diver Medic on arrival at the surface. **The Company Medical Advisor should be contacted Immediately and advice sought regarding the condition of the Diver and any potential subsequent decompression requirements.**	Diving Supervisor/ Diver Medic

5.13 Inability to Recompress a Diver on Arrival at Surface for Surface O_2 Decompression

5.13.1 This scenario is likely to fall under two categories:

- Mechanical breakdown; or
- Medical problem with the Diver (ears or pneumothorax).

INABILITY TO RECOMPRESS A DIVER ON ARRIVAL AT SURFACE FOR SURFACE O_2 DECOMPRESSION		
Step	Description of Task	Action By
SCENARIO 1: MECHANICAL BREAKDOWN		
1	Where the main lock is held at 15m (USN Decompression Tables) the Diver should enter the entry lock and the two locks equalised to provide recompression as deep as possible.	Diving Supervisor
⚠	**The Company Medical Advisor should be contacted immediately and advice sought regarding completion of the decompression**	
2	If the Diver cannot be recompressed at all in the chamber due to a major mechanical failure the Diver should be made comfortable and placed on pure oxygen using a demand valve.	Diving Supervisor/ Diver Medic
⚠	**The Company Medical Advisor should be contacted immediately and advice sought regarding the situation**	
3	In both of the above scenarios the Diver should be monitored by a Diver Medic at all times	Diving Supervisor/ Diver Medic
4	The Dive system Technician should diagnose the problem and rectify ASAP	Diving Supervisor/ Dive System Technician
SCENARIO 2: MEDICAL PROBLEM		
5	The Diver may be unable to be recompressed due to a problem with their ears or pneumothorax	
6	A Diver Medic to assess the situation with the Diving Supervisor	Diving Supervisor/ Diver Medic
7	In the event of a problem with the ear a decision must be made to continue to depth and force the ear which may result in treatment after the decompression	Diving Supervisor/ Company Diving Medical Advisor
8	In the event of pneumothorax there are various medical procedures which should be considered depending on the severity	Diving Supervisor/ Company Diving Medical Advisor
⚠	**In any medical situation contact should immediately be made with the Company Diving Medical Advisor to notify of the problem and obtain guidance**	

5.14 SCUBA Specific

5.14.1 These procedures can only be used as a guide as other unknown factors will need to be considered prior to attending to the emergency. Good communication is important at all times, updating the diver or supervisor of any changes or developments during the emergency.

Standby diver

5.14.2 All SCUBA diving will be undertaken in buddy pairs and each diver will act as in-water standby for the other. Divers must remain in close proximity to each other to be able to render assistance where required. Extremely low visibility conditions may dictate the need for a buddy line attaching the two divers. The use of a buddy line should be carefully considered in environments where it could create an additional risk.

5.14.3 In the event of an emergency the in-water standby will inform the supervisor if they are not already aware, and recover the diver to the surface. The diver will be recovered to the surface using their own buoyancy so as not to jeopardise the safety of the standby diver in the event a separation occurs and also to ensure the casualty remains buoyant. For an unconscious diver the standby will maintain an airway to ensure exhalation during ascent.

5.14.4 Upon arrival at the surface the designated surface recovery diver will assist the standby in the recovery of the diver to deck. It must be considered that upon arrival at the surface the standby diver may be tired, stressed or in shock. Once the through water communications transceiver breaks the surface voice communications will cease to operate.

Lifting / hoisting an injured diver back on board

5.14.5 Aside from the ladder there should be a secondary method of bringing the divers out of the water. This may be a secondary lift system such as a diver lift or man riding hoist.

5.14.6 The ladder used for diving operations should extend below the water and above the deck level. If one or both divers require assistance to get out of the water, then the emergency davit and hoist should be used.

5.14.7 Davits and hand operated surface winches can be used to retrieve a diver requiring assistance, hooking on to their harness. Where a safety boat (RIB) is on standby during operations where the vessel has restricted movement, this can also be used to recover a standby or diver onto the DSV.

Loss of communications

5.14.8 If voice communications are lost the divers are briefed that the dive will terminate immediately and the divers will make their way to the surface, unless the divers are on tethered lifelines where communication will continue through the use of line signals.

5.14.9 Divers will continue to communicate with each other through the use of hand signals.

5.14.10 Following loss of communications, the supervisor will continue to attempt to contact the divers at regular intervals relaying instructions as a situation may arise where either the communications start working again or that communications for some reason have become

one way. The divers will also follow the same procedure but stating their actions and make the ascent.

5.14.11 If the supervisor becomes concerned about the diver's breathing or there is a loss of comms to the diver the supervisor will make contact with the standby diver who will use hand signals to communicate with the other diver. If the diver is unresponsive this will lead to an unconscious diver recovery – see below.

Loss of gas

5.14.12 Should a diver loose breathing gas they should immediately go onto bailout, inform the supervisor and both divers will return at once to the surface ensuring that any required stops are undertaken.

Entangled divers

5.14.13 The diver should stay calm and inform the supervisor of the problem. They should attempt to free themself and request assistance from the other diver, if required. Keep the surface informed of progress / events.

5.14.14 It may be necessary to involve the in-water standby diver who can be directed initially by the supervisor and then by the entangled diver.

5.14.15 Any serious delays in resolving entanglement could result in other issues like a greater than planned decompression penalty plus difficulty of movement from an increase in the tidal current flow.

Unconscious Diver recovery.

5.14.16 In the event of an emergency the in-water standby will inform the supervisor if they are not already aware, and recover the diver to the surface. The diver will be recovered to the surface using their own buoyancy so as not to jeopardise the safety of the standby diver in the event a separation occurs and also to ensure the casualty remains buoyant. For an unconscious diver the standby will maintain an airway to ensure exhalation during ascent.

5.14.17 Upon arrival at the surface the designated surface recovery diver will assist the standby in the recovery of the diver to deck. It must be considered that upon arrival at the surface the standby diver may be tired, stressed or in shock. Once the through water communications transceiver breaks the surface voice communications will cease to operate.

5.14.18 If the casualty is unconscious the standby diver will monitor the divers gas supply and if required manually switch the diver to bailout.

Uncontrolled ascent.

5.14.19 Divers with no symptoms and feeling fine should remain where they are and await assistance from the standby diver.

5.14.20 The in-water standby should be prepared to assist the affected diver. Terminate dive and recover both divers to the surface.

Parted/ lost downline

5.14.21 Should anything happen to the downline, or if the divers are unable to relocate it, they will communicate this to the supervisor who will instruct them to launch a Delayed Surface Marker Buoy (DSMB) and make a safe ascent, including any required stops.

5.14.22 The supervisor will also ensure that the vessel is notified that divers will need to be recovered. Where the vessel is restricted the RIB will be deployed to monitor the divers DSMB's.

Lost buddy procedure

5.14.23 In the event of a diver being unable to locate their buddy they must immediately inform the supervisor; divers will also have diver to diver communications. The supervisor will direct the divers to a suitable point, usually the downline, where they can re-unite.

5.14.24 In the event of lost communications, the diver search for one minute and following failure to find their buddy will deploy a DSMB (in the instance where the downline cannot be located) and return to the surface.

Fire or smoke in dive control

5.14.25 Attempts will be made to fight the fire, without putting any personnel at risk, but this may be fire or smoke from somewhere else on the vessel nearby, for example the door to the engine room is nearby.

5.14.26 Where the communications are portable, as with most SCUBA operations, the system will be removed to an unaffected area of the vessel, this could also include to the safety boat.

5.14.27 If required, the supervisor will don a BA Set to minimise smoke inhalation. The supervisor should be able to continue to speak to the divers and the deck even if the dive control has an unbreathable atmosphere.

5.14.28 The supervisor will recall the divers to the surface advising of the situation and giving any instructions that may be required for exiting the water.

5.14.29 The divers will carry out any in-water stops, as normal, if possible, otherwise on surface they would have to go into the chamber, if the fire has been contained, or transported to the nearest chamber ashore.

5.15 Emergency Evacuation Plan Overview

5.15.1 If an emergency situation arises where a diver must be recovered from the water all tasks must cease and all available personnel must be ready to assist, other than those engaged in tasks that affect the overall safety of the rest of the team or the DSV. All members of the professional dive team are trained and competent to carry out emergency rescue procedures both on and under water. The safety of other members of the team must be ensured throughout rescue operations.

5.15.2 The casualty will be recovered to the vessel as quickly as is safely possible by the standby and other members of the surface team. The method in which the diver will be recovered to the

vessel will be dependent on the conditions at the time but a recovery davit and hoist is available should it be required.

5.15.3 First aid will be administered to the diver on the vessel; at least two members of the professional team are qualified to administer first aid and are trained in the recognition of diving related injuries. Medical grade oxygen will be available. If any diver requires oxygen the DSV master will inform the coastguard immediately via VHF or telephone.

5.15.4 In the event of any emergency the diving supervisor will take control and direct any rescue operations as soon as they are able to. In the event of a casualty needing to be taken to shore the vessel will leave its mooring and do so as soon as all other persons in the water are recovered.

5.15.5 In the event of any person being injured and it not being possible to return to shore for treatment, the DSV master will radio the coastguard on VHF channel 16 or 67, explaining the situation and making the necessary arrangements for their transfer to receive medical attention.

5.15.6 As with any diving related incident the individual's equipment should be preserved and a record made of its condition, it should not be dismantled. The HSE Diving Inspector should be contacted following any serious incident.

6.0 Medical and Hyperbaric Support

6.1 Medical and Hyperbaric Support Services

6.1.1 The contact details for the closest hyperbaric chambers are provided below.

Chamber	Mileage from Southend-on-Sea	Time from Southend-on-Sea
Marine Services Port of London Authority Mark Lane Gravesend, DA12 2QB	37.5*	59 minutes*
London Hyperbaric Medicine Ltd Whips Cross University Hospital Leytonstone London, E11 1NR	40	53 minutes

*Overland route. Estimated time over water is 60 minutes in poor conditions.

6.1.2 At sea contact should be made with the Coastguard on VHF Channel 16 or by calling 999

6.1.3 The number for the National Diving Accident Helpline I 07831 151523

6.2 Onshore Hyperbaric Facilities

6.2.1 The planned dives fall within the category of 'dives between 10 and 50 meters with planned in water decompression not exceeding 20 minutes' and therefore an assessment has been made as to the risk of DCI and the likelihood of a diver requiring emergency recompression.

6.2.2 All dives are within the limits of recreational diving. Sufficient provision has been made for bailout gas supplies to ensure all ascents can be made safely, even in an out of air situation. All professional team members are experienced in both the depths and conditions and the tasks being undertaken require minimal exertion. The supervisor will ensure that the limits of the decompression schedule are not pushed. Therefore, the risk of DCI is not assessed as significant.

6.2.3 The closet hyperbaric units are located at Gravesend and Leytonstone, whilst the usual method of casualty evacuation is by helicopter this cannot be assumed due to operational constraints and therefore the proximity of the chamber is assessed through the time to transit via DSV to a harbour and from the harbour to the unit via car or ambulance.

6.3 Accident and Emergency Departments

6.3.1 For non-hyperbaric treatment of casualties, and those not requiring ambulance support, the following Accident and Emergency Departments are available.

Hospital	
Southend University Hospital Prittlewell Chase Westcliff-on-sea SS0 0RY **01702 435555**	**Whipps Cross Hospital** Whipps Cross Road London E11 1NR **07999 292999**

6.4 Other Useful Contacts

6.4.1 The following contacts are deemed useful and listed here for ease of reference.

Contact	Telephone Number	VHF Channel
Duty Diving Medical Officer	07831 151523	
HM Coastguard (Local Office)	999 (ask for	16 or 67
VTS (London, East of Crayfordness)	01474 560311	68 or 69
Marine Services Gravesend (DA12 2QB)	01474 706473	
Port London Authority (lower district)	01474 562212	
HSE Diving Inspector	07768 331336	
RIDDOR	08453 009923	
Mark James	07917 703176	
Steven Ellis	07906 647853	