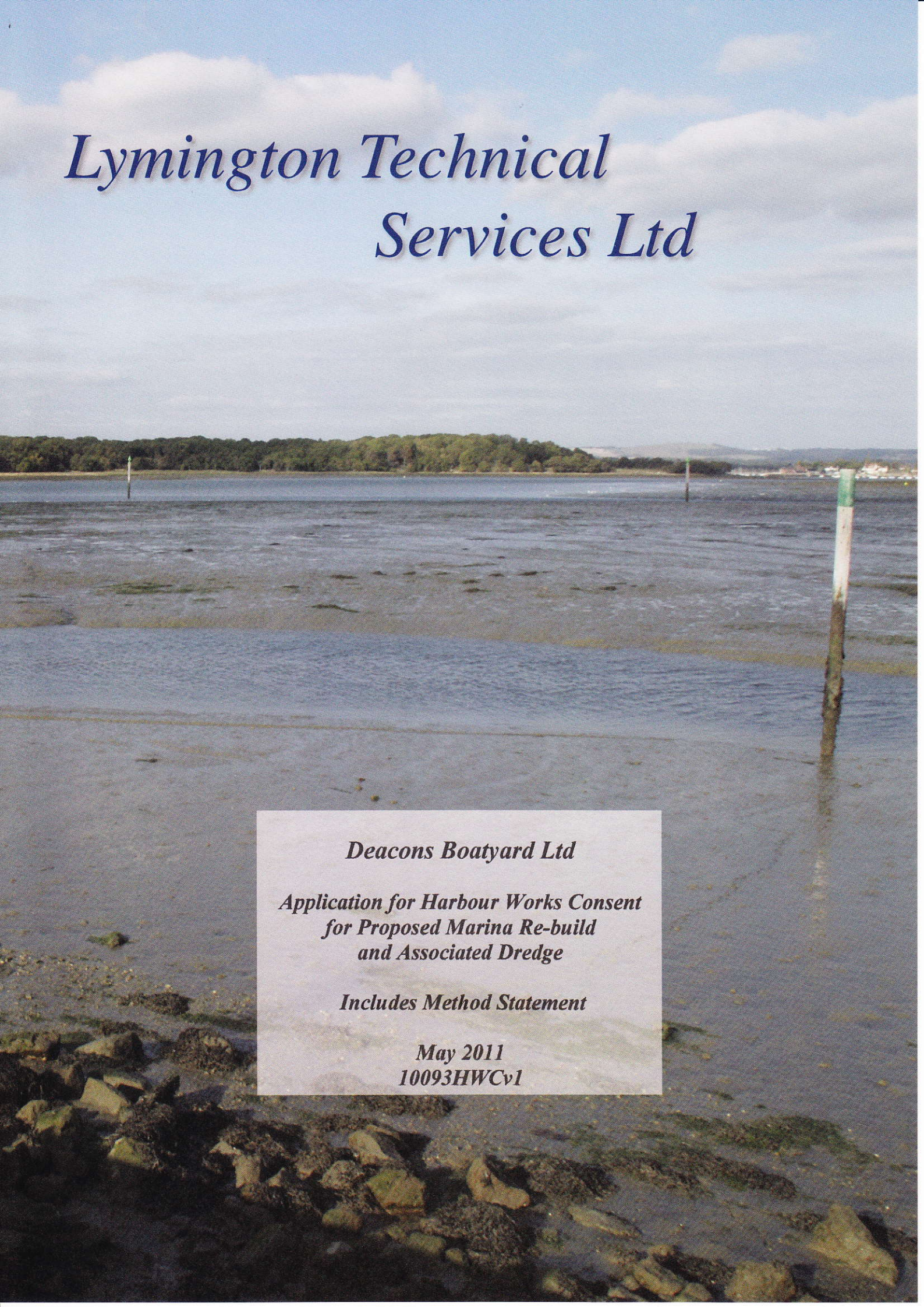

Lymington Technical Services Ltd

Deacons Boatyard Ltd

Application for Harbour Works Consent for Proposed Marina Re-build and Associated Dredge

Includes Method Statement

May 2011
10093HWCv1

Deacons Boatyard Ltd

Application for Harbour Works Consent for Marina Re-build and Associated Dredge

Supporting Statement

Document 10093HWCv1 May 2011

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APPENDIX (bound separately)

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ADDITIONAL INFORMATION

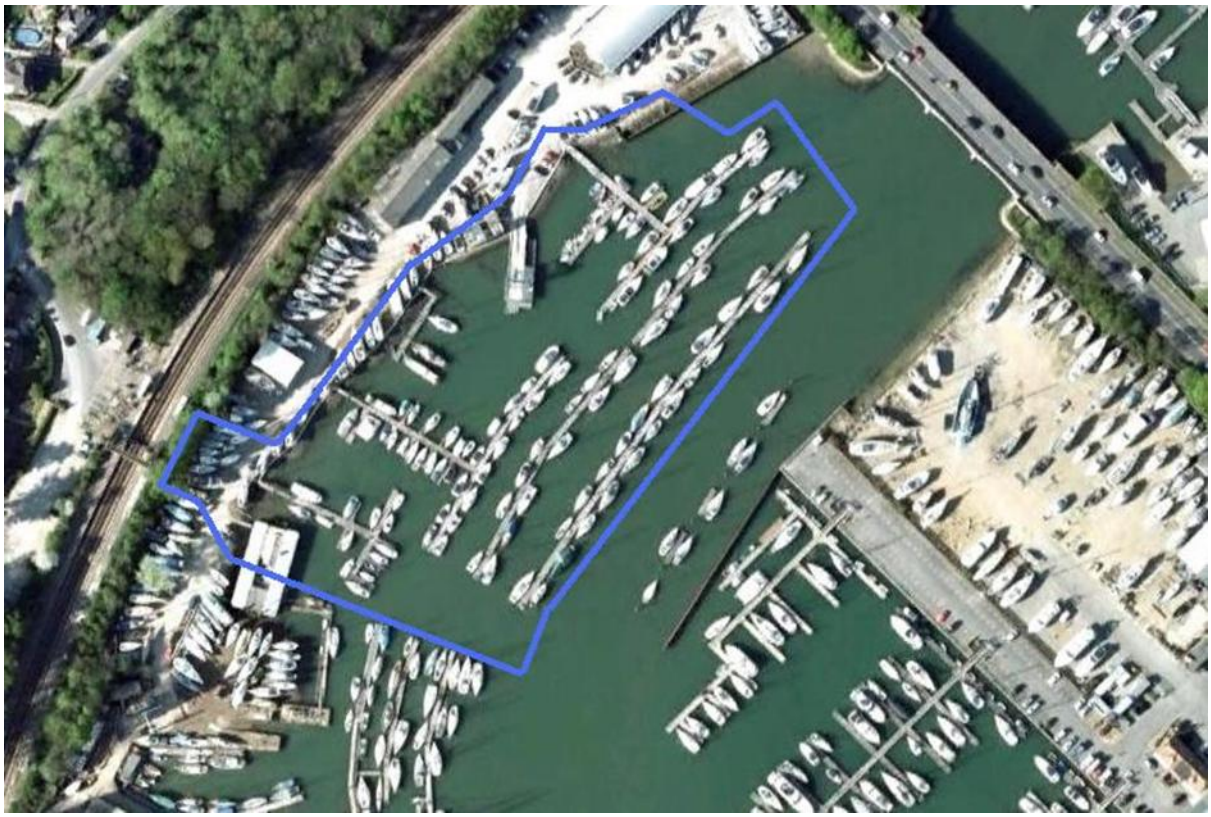
ABPmer Report R1784 Hydrodynamic Assessment

1 BACKGROUND

This document has been produced to provide supporting information for the Harbour Works Licence application.

Deacons Boatyard is a medium sized boatyard and marina situated on the western edge of the River Hamble just downstream of the A27 bridge. The boatyard has been operating continuously since 1922.

The photo below shows the site with the Crown Lease indicated in blue.



The River Hamble is widely considered to be the Mecca of sailing and the existing boatyards/marinas provide essential services to maintain this centre of excellence. Continued investment in such facilities is necessary to maintain this status.

The marina consists of a mix of both wet and drying berths in a similar layout to the adjacent yards.

In the last few years the site has undergone investment leading to improved land facilities. The floating pontoons forming the marina are some 40-60 years old and require replacement. Additionally the piles all require replacement.

The existing linear layout is no longer suitable as boats are now wider and the current layout is making operation difficult. As part of the replacement the opportunity will be taken to modernise the layout whilst keeping the same number of berths. In order to prevent any negative impacts the rebuild will be within the current site footprint.

The modern style of marina berthing is designed specifically to accommodate the current distributions of vessel sizes and is common in this river. The current layout is prone to double berthing which makes operation difficult. This can be seen in the lower part of the previous photo (Elephant Boatyard).

Over the years the levels of silt have built up within the marina area and the opportunity will also be taken to reinstate practical operational depths as were previously available. In terms of marine licences this is classed as a capital dredge because dredging has not been undertaken within the last 10 years. In operational terms it is a maintenance dredge.

2 PHYSICAL CHARACTERISTICS OF SCHEME

The proposed marina will provide pontoon moorings for a similar number of vessels as at present. There will be no increase in vessel numbers. The following drawings are supplied:

Drawing 10093/1A - shows the existing layout with soundings

Drawing 10093/2C - shows the proposed layout and dredge

Drawing 10093/5A - shows the proposed layout and dredge without soundings for clarity

Drawing 10093/6A - shows the existing layout with typical boats

Drawing 10093/7 - shows the Hamble Yacht Services 2004 proposals

The main construction activities are:

-the removal by dredging of approx 6,000m^3 of material for disposal at sea. Dredging will be conducted using a backhoe dredger and split hopper disposal barges. The use of the dredged material in a beneficial disposal operation is considered unrealistic at this time (see later).

-the installation of marina pontoons using pre-assembled components that connect together on site. Steel tubular piles driven from floating plant will be used to hold the units in position. Non-percussive techniques will be used wherever practicable.

The following coordinates (WGS84) define the area of the works:

50^o 53.0161' N 1^o 18.2664' W
50^o 52.9850' N 1^o 18.2089' W
50^o 53.0696' N 1^o 18.1027' W
50^o 53.0805' N 1^o 18.1230' W
50^o 53.0760' N 1^o 18.1776' W

3 STATUTORY DESIGNATIONS

Site of Special Scientific Interest (SSSI) - The nearest SSSI (Lincegrove and Hackett's Marshes) is approximately 500m downstream of the site.

The Special Protection Area (SPA – Solent & Southampton Water) and Ramsar site overlay the SSSI, i.e. some 500m downstream.

The Special Area of Conservation (SAC – Solent Maritime) boundary has been drawn on the River Hamble using a small scale map which has presented some anomalies in the past. When this boundary was established it was intended to follow the MLW mark except where development existed (i.e. marinas and boatyards). In the majority of cases the boundary excludes hard areas such as marinas and shore connected pontoons (Mercury Yacht Harbour being a relevant example).

At Deacons Boatyard the boundary follows approximately the MLW mark and hence includes the bulk of the pontoons. This is an anomaly that has occurred at other locations (principally Swanwick Marina and Universal Marina) where similar work has been permitted.

Site of Importance for Nature Conservation (SINC) – No part of the works is within the SINC boundary.

4 APPLICATION PROCESS

The following main applications are necessary for these works:

LPA – Primarily for the land based components down to the MLW mark (Town & Country Planning Act boundary). It is usually accepted that works crossing this boundary (the pontoons in this case) are included in the planning application because of associated impacts. This would include environmental, transport and general development issues. It *does not* include the dredging works.

MMO (Marine Management Organisation) – CPA/FEPA licences (2 No.) are required for the dredging and disposal of the material and for the installation (deposit on the sea bed) of the marina. This includes all the marine aspects of the work up to MHWS.

Harbour Works Consent – this is primarily concerned with safe navigation and environmental impacts on the existing waterway.

Flood Defence Consent (formally Land Drainage Consent) – primarily concerned with any works that may have an impact on flooding.

It should be noted that the above applications overlap (for example the MMO consult all of the others as statutory consultees).

The MMO have granted licences for the works and these are included in the appendix.

The EA have granted Flood Defence Consent and this is included in the appendix.

5 OPERATIONAL DETAILS

The boatyard will continue to be operated as at present. The proposed works should be seen as a full scale maintenance operation as is carried out at other marinas, the recently permitted works at Swanwick Marina being a prime example.

The new layout has been designed and will be operated in accordance with the Yacht Harbour Association's Code of Practice. Additionally, the Green Blue initiative will be adopted to ensure best environmental practice. Recycling is already in operation.

Although no fuel services will be supplied an oil spill kit will be kept on site in order to deal with any spills.

6 COASTAL PROCESSES

6.1 Existing coastal process characteristics

The boatyard is sited in the upper reaches of the estuary in a highly developed area. Tide flows through the A27 Bridge just upstream are constrained and hence relatively strong. At the midpoint of the outer berthing at Deacons the tide has a typical flow velocity of 0.75m/s flood and 1.3m/s ebb (1.5kn and 2.6kn respectively), (ABPmer Report R1784). It is for this reason that the site has not required dredging within the 10 year maintenance cut-off as the levels of deposition have been small per annum.

Following the construction of Swanwick marina (in the 1960's) a sheet pile training wall was installed to replicate the edge of the removed bank and encourage the tidal flows to pass round the bend in a smooth manner. The wall position is somewhat further into the channel than the original banks leading to the higher tidal flows. Due to problems with the training wall on a flood tide (large cross currents at the end) holes were cut to dampen the effect.

On the flood tide these holes allow the tidal flow to head more towards Deacons Boatyard than was previously the case. This flow (which carries the suspended sediment) explains why the inshore area does not self-scour.

The tidal levels for this area are as follows:

HAT	5.1m
MHWS	4.6m
MHWN	3.8m
MLWN	2.0m
MLW	1.4m
MLWS	0.7m
LAT (CD)	0.2m

6.2 Tidal prism and flow characteristics

Impacts on tidal prism (volume of water between HW and LW) and the flow characteristics are an area that requires examination for any potential impact.

The total volume of dredging proposed is approx. 6000m^3 but this includes material removed below Chart Datum (Lowest Astronomical Tide).

The volume of material to be removed that would contribute to an increase in tidal prism is 850m^3 on the basis of CD. However, as this level is only rarely reached it is more reasonable to take MLWS as the base of the tidal prism calculations. This gives an increase of 350m^3.

Taking MLW (1.4m) to MHWS gives a prism increase of 45m^3

The tidal prism for the Hamble estuary is approximately 6.5 x 10^6 m^3.

In terms of the effect on the tidal prism of the estuary the volume of increase in the prism is not significant. The volumetric change is so small that it is well below measureable values.

In terms of the flow regime the local deepening will have two possible impacts on the flow. By deepening the section there will be less effect of bed friction on the flow so it will tend to travel faster. However, the increase in cross section will tend to reduce the flow velocities. Additionally, the frictional effects of the piles, pontoons and moored vessels will add another complexity.

Modelling the combination of such effects is difficult and can be misleading. In similar situations of marina dredges and constructions that we have been involved with (e.g. Universal Marina, River Hamble, Hampshire) it has been apparent that the combination of such changes balance well with no adverse impacts being identified. This is discussed further in the ABPmer report on the hydrodynamics.

6.3 Sediment Budget

The initial dredge will result in a net loss of approximately 6000m^3 of material. Future maintenance dredges would remove siltation. However, on the basis that a dredge has not been required in the past it is anticipated that a maintenance dredge would not be required for at least 5 years. This figure is conservative (i.e. short) and is necessary to cover any potential impacts of the large dredge planned at Swanwick.

Siltation plots for nearby marinas indicate a low level of deposition of approximately 0.2m at inshore locations.

Re-distribution of this material (beneficial re-use) within the harbour is considered impractical at this time. It will, however, be considered during future dredging operations (see also later).

Due to the locally low levels of deposition no long term effects on suspended sediment levels or the sediment regime are anticipated. There will be very localised, short-term increases in suspended sediment during dredging operations but due to the plant selected the dispersal area will be very local to the dredger.

6.4 Intertidal Areas & Dredging

The proposed dredge has been carefully designed to minimise any loss of intertidal areas. This is achieved by sloping the inshore section of the dredge such that the top of the slope is at MLW (1.4m ACD). By reducing the permitted dredge tolerance in this region the area removed has been further reduced. The area to be removed above this level is 114m^2. This is primarily a narrow strip along the edge of the bank.

In order to mitigate this loss some of the inshore berthing is to be removed (as indicated on drawing 10093/2C). This effectively frees up some 424m^2 of inter tidal area.

To summarise, careful arrangement of the dredging and removal of some inter tidal berthing has provided a net gain of 310m^2.

6.5 Beneficial disposal

Beneficial use of dredged material is method of disposal that many sites would consider to be an advantage. The most likely use of dredged material is for the re-nourishment of intertidal mudflats. In order for this to be effective the nature of the material needs to be similar to that of the mudflats.

A practical method of beneficial disposal results from the use of agitation (or dispersive) dredging. In this process deposited material is agitated so that it becomes suspended within the water column. Tidal flows are then allowed to carry this material throughout the estuary. This provides a relatively natural re-distribution of material. In the Hamble Estuary (and others locally) such dredging is not permitted.

For the Hamble the use of backhoe dredgers is the accepted (by the authorities) method. For this type of dredger the removed material is contained within the hopper barges so beneficial disposal operations need to operate from the barges.

Two methods of disposal present themselves, either spraying the fine material over the mudflats (a technique known as ‘rainbowing’) or dumping the material just seawards of the mudflat and allowing the hydrodynamics to re-distribute the material.

There are currently issues with both of these methods. Rainbowing (commonly used for beach replenishment) may well damage the fabric of the mudflat by the mechanical action of the displacement. Dumping material may locally alter the hydrodynamics. Dumping material in a gradual manner is not practical with the type of split hopper barge used in this area (impossible to ensure gradual release). In both cases it seems likely that small-scale trials need to be undertaken.

It is considered that beneficial disposal, whilst a good idea in principle, is beyond the scope of this project. The volumes of material involved are not significantly different to the annual maintenance dredges undertaken at most of the larger marinas. To date no site on the river has undertaken beneficial disposal, all material being disposed of at sea.

We are prepared to work with the authorities with a view to using beneficial disposal in the future but this must be a joint exercise and not one instigated by the dredge material producer alone.

6.6 Independent Hydrodynamics Assessment

Following initial discussions with the Harbour Authority the Harbour Master requested an independent assessment of the proposal. This was to determine the following:

- Potential changes to the tidal flows in the area of the boatyard and the main channel
- Implications to the sediment behaviour outside the footprint of the boatyard

This assessment was undertaken by ABPmer as report R1784. A copy of this report is included with the submitted documentation.

The summary from this report is reproduced below:

Summary

ABP Marine Environmental Research Ltd (ABPmer) has been commissioned to undertake a desk study assessment of the hydrodynamic and sedimentary implications of the proposed capital dredge and new mooring configuration at Deacons Boatyard, Bursledon, on the River Hamble.

The proposed reconfiguration of pontoons/berths at Deacons Boatyard is designed to bring the site up to modern operational standards whilst maintaining the same number of berths within the same overall area of water. This is to be achieved by removing the existing detached pontoon structures, which are aligned parallel with the bank and river flows, and replacing them with finger pontoons and pontoon hammerheads. The capital dredge will be undertaken to a depth of 1.5m below Chart Datum (CD) to provide deeper water throughout the boatyard, with further dredging to 1.0m below CD in the vicinity of the quay where boat lifting is undertaken, The total capital dredge volume is estimated around 4180 to 5760m^3 depending on the dredge tolerance (up to 0.3m).

Overall, the effect of the proposed development on the marine environment is considered small and will be retained very local to Deacons Boatyard with most effects within the area of the facility itself. A small displacement of the deep channel flows immediately down estuary of the boatyard (beyond the extent of the training wall) may occur over the long-term, however, this will not adversely affect the overall integrity or functioning of the river. Furthermore, the proposed works are unlikely to adversely affect the sediment behaviour outside the footprint of the boatyard and the changes to the hydrodynamics will not affect navigation within the estuary.

7 ECOLOGY

This is a well-developed section of the river and this explains why it is excluded from the protected areas. However it contains some inter tidal habitat that has the potential to act as a food source for SPA birds. Local observations indicate that birds prefer the quieter areas just downstream (within the SPA). The proposed mitigation will make a large area available to waterfowl if they choose to visit.

The dredge and pontoon layout has been designed specifically to minimise any impact on the important areas. The proposed method of dredging will also minimise any effect of smothering from suspended material.

Another feature of importance is that of eelgrass (Zostera Marina). Inspections of the site and the general locality show no evidence of this.

8 NAVIGATION

The proposed marina footprint has been designed such that it does not exceed the current footprint in navigation terms. It might be argued that the two outer pontoon lines will be connected thereby closing a small channel. However, this is not a 'secondary navigation channel' by any definition of the term. The use of the current gap for through navigation is unsafe due to the moored vessels and the strong tides in this locale. This area is only used to access the berths.

8.1 Issues raised as part of the MMO applications

The MMO licences relate to the Coast Protection Act 1949 and the Food and Environmental protection Act 1985 (as amended).

As part of this licensing process Public Notices were placed requesting representations on *navigational grounds*. This resulted in a number of representations. These representations and responses are included in the appendix for reference. For the purposes of this document the representations have been grouped and are discussed in detail below.

During the process of various representations and responses one respondent made a libellous allegation against the author of this document. At the time of writing this document this allegation has not been withdrawn. As a result of this a separate section is included below which deals with the relevant part of his response.

8.1.1 Secondary channels and the HYS appeal

The definition of Secondary Channels is unclear but is best described as an alternative navigable channel. In large harbours these are more commonly referred to as 'small boat channels' and used by leisure craft to keep them out of the way of large commercial vessels. A good local example is in the entrance to Portsmouth Harbour.

In the entrance of the River Hamble a midstream mooring pontoon (B moorings)with large depths on both sides is marked by Red/Green/Red and light indicating that the preferred channel is to starboard (east of the pontoon). The upstream end of this pontoon has a Red mark indicating that the main channel is to the east. Although not specified as such the channel to the west of the B moorings is effectively an alternative navigation channel (otherwise the marker would be all red).

The key point being that for a secondary channel to exist there must be safe navigation at the entrance, during passage and at the exit. In the example described above this is clearly the case.

Examination of the UKHO charts for the Hamble shows no other areas that could be reasonably described as a secondary channel.

It is true that there are areas within the river where parallel sets of moorings exist with gaps between them. These gaps are obviously essential for moored vessels to leave and return to their moorings. In some areas there is access for small craft (i.e. powered or paddled but not under sail) to pass down these gaps.

Good examples are listed below:

1. Between A moorings and Hamble Point hammerheads
2. Between F and G moorings downstream of Mercury Yacht Harbour
3. Between J and K moorings off Universal Marina
4. Between U and V moorings off Bursledon Point.

In all the above good entrance and exits are possible. It might be argued that there are actually many more possible routes but in reality the nature of the moorings (often double berthed) and use by moored vessels precludes these routes for craft under safe navigation.

Whilst it is true at Deacons that there are two areas where small vessels could transit through the existing marina it is obvious that this could only be by small craft in full control. This would limit it to canoes and small dinghies and not vessels under sail. The western area is particularly narrow and small craft navigating this close to larger vessels would be not taking due care. The outer area is slightly wider and does afford some respite from vessels in the main channel. However, once in this area the craft are in conflict with larger vessels manoeuvring to and from their berths. This is again an unsafe practice.

The proposed marina layout will offer canoes and dinghies four large fairways (between the jetties) to seek refuge. Information from Deacons suggests that the use of these two areas by such small craft is virtually nill. In winter months the existing main channel has less traffic and so could be used by canoes etc. In summer months the uses of the gaps in the existing marina are likely to be more hazardous dues to movement of berth holders.

Following the initial raising of this issue by canoeists a log has been kept at Deacons recording the passage of small vessels in the area. This log and some typical photos is included in the appendix. This data is supported by the site security cameras and since 25th January 2011 the recorded data shows that most small craft actually pass close to the training wall and none through the gaps at Deacons. Two typical examples are shown below:

There has been a suggestion that a 'vessel in difficulties' might need the existing gaps. It is obvious that such a vessel should clearly not enter a narrower channel. If it was a serious situation then coming alongside the nearest point is more appropriate and safe navigation practice.

Reference has been made to the Hamble Yacht Services appeal. The HYS application proposed a closure of a gap which would preclude the use of a large expanse of off channel water (by creating an effective 'dead-end').

The HYS appeal related to a proposed expansion of mooring facilities. The objections to this development centred around two key questions –

1. Whether the proposal would result in an unacceptable impact on the safety and ease of navigation within the River Hamble; and
2. Whether the scheme would constitute development of the River, leading to loss of an open recreational area.

The proposal was to extend the existing HYS outer berthing in 2 parallel sections connected to the existing. This would have extended the moorings some 34m seaward of that existing. Drawing 10093/7 shows the existing layout and that proposed in 2004 (the appeal layout). A copy of the inspector's report is included in the appendix.

The key points of the inspector's report are listed below:

Issue (a) whether the proposal would result in an unacceptable impact on the safety and ease of navigation with the River Hamble.

- There was not even agreement as to terminology and description of secondary channel as opposed to a route or passage.
- Inconsistent comments from Harbour Master, in that small tenders should not pass the hammerheads at Port Hamble yet he proposed a bridge between proposed outer pontoons.
- Risk assessment is only a useful tool rather that a decisive process.
- Use of area inshore of the existing piled moorings for passage through as an easy navigable route.
- The inspector questioned the ease of navigation of the proposed 60m passage between the 2 pontoons (some 15m) with berthed vessels and then the 3.2m wide bridge. This route does not offer a successful mitigation.
- The XOD boats currently moored on the piled moorings would have difficulty in departing from their mooring and then making a sharp turn to avoid the proposed pontoons. This is seen to severely restrict their ease of navigation.

Issue (b) whether the scheme would constitute development of the River, leading to loss of recreational area.

- The appellants argued that the site is used for the mooring of craft and not for recreational purposes. The inspector stated that such transit is part of the experience of the river.
- The inspector stated that it is the openness of the river that makes it unique and different. She concluded that the proposed scheme would change its character and obstruct an area where there is currently public access.

Other matters

- The inspector supported the LPA concerns that development into the open river would set an undesirable precedent.

With regard to Deacons there are some key differences between the HYS proposal and that proposed by Deacons (see also drawing 10093/6A):

- There are few midstream moorings where the use of tenders means that the shortest route is past Deacons. The closest public slipways are just upstream of Deacons on the west bank (but no parking available), at Lands End hard (limited parking in Lands End Road) and just downstream of Swanwick Marina on the east bank (with a large public car park). Only persons using the slipway upstream of Deacons for vessels moored on the piled moorings (Z) have a short route. For such tenders the most sensible route is close to the Z mooring line.

There is clearly no advantage of using the gaps at Deacons as a crossing of the channel needs to be done.

- The existing gaps between moorings Y and X and X and the land connected Deacons pontoons are some 150m in length and with as little as 7m on average as the available gap. With reference to the inspector's concern regarding a 60m channel between expensive vessels the gap here is clearly significantly longer and narrower and hence of much greater concern as a navigable passage.
- All of the vessels berthed on the outer two pontoons are Deacons customers as these pontoons are operated as part of Deacons boatyard. The proposed layout provides better access and egress than currently.
- The use of these two gaps as a navigable passage by vessels travelling from upstream to downstream of the site or vice versa (and hence not vessels berthed in Deacons) is flawed. The Inspector's comments that a shorter and wider channel is a restriction, demonstrates that these gaps are not suitable. The Inspector's comment that it would be unacceptable for XOD (and therefore other similar) craft to make a sharp turn at the end of such passage is highlighted by the necessity to make just such a manoeuvre both at the upstream end (shallow water) and the downstream end (another boatyard – which consistently has multiple rafted vessels on its outer pontoon) at Deacons.
- Deacons proposal overlays the existing area of berthing under their operation and does not project further into the river.

8.1.2 Loss of freedom of navigation

Following on from the above there is no loss of freedom of navigation as passage through the existing gaps is not considered a safe navigable route.

8.1.3 Winding holes

Winding holes relate to an indented area (specifically on canals) where a vessel may partially enter and then turn in locations where the canal is too narrow. There are no defined such locations on the River Hamble.

Good navigation should prevent any large vessel getting into this position near the A27 Bridge. The proposals make no difference to the navigable area available at the upstream end of the marina. Actually the four fairways will provide suitable 'winding holes', so this is an advantage over the current layout.

8.1.4 Loss of recreational space

It is not completely clear as to which areas this refers to but the existing gaps between the Deacons moorings are clearly not recreational space. The area near the slipway might be regarded as recreational space (for access) and this is not being affected.

8.1.5 Public Slipway immediately upstream of Deacons.

The proposals will have no effect on the stability of use of this slipway. Access to and from the slipway will remain as at present. A concern regarding stability due to the proposed dredge is not relevant as the respondent has misunderstood the drawings.

8.1.6 Vessel numbers

Various individuals have tried to count the vessel numbers from aerial photographs. This can be misleading as some vessels will be ashore, some elsewhere etc. The main concern from objectors is an increase in boat numbers. For the record it is stated that the reconfiguration will NOT increase the vessel numbers beyond that at present.

8.1.7 The Marchioness Disaster

A respondent made reference to the Bowbell (more commonly referred to as the 'Marchioness Disaster'). This is, whilst being rather melodramatic, of interest. In the investigation the Bowbell was found to have failed to keep a proper lookout. However, both vessels were navigating in the centre of the channel and poor visibility from both vessels was cited. In the Hamble normal rules of navigation (Colregs) apply and in some cases smaller craft must give way to larger craft if they are constrained by their draft or restricted in manoeuvrability. This effectively means that small dinghies and canoes should avoid larger craft. As mention previously the new four fairways provide a much safer place of shelter.

8.1.8 A27 Bridge

A concern has been raised regarding the tidal flows and the impact of both the A27 Bridge and the training wall opposite Deacons.

It is true that the A27 Bridge constricts the flow which will be locally faster between and immediately upstream and downstream of the piers. This is, however, historic and the proposals for Deacons have no impact on this.

The training wall (western end of Swanwick Marina) was erected (as a solid structure) to replicate the hydrodynamics after removal of the river banks (mudflats) in this location. Following installation it was apparent that flood tidal currents passed across the end of the wall creating a cross-current. This was alleviated to a degree by the cutting of openings in the sheet pile training wall. The fundamental issue here is that training walls will only work with one flow direction (which is why they are commonly employed in river diversion and control works). The training wall was always going to create problems on a flood tide. Whilst this is all historic and Deacons proposals have no direct impact on this; the four new fairways will actually provide a refuge if a vessel should be caught by the existing tidal conditions. This is a positive safety impact.

A concern has been raised that the development will affect the stability of the bridge due to an increase in scour. This has arisen from a misinterpretation of the drawings by the objector.

The existing 'local scour' at the piers is a result of the vortex system (commonly known as the 'horse-shoe vortex') that is generated by the shape (and angle) of the piers and reduction in cross-section.

It is scour at these locations that is primarily used to determine the depth of 'equilibrium scour' (the expected maximum depth of scour - see for example the Colorado State University Equation, Froehlich's equation or many others) and hence safety. As the flow passes beyond the structure local scour does not occur (because as the cross section increases the velocities reduce).

The appendix provides further detail.

8.1.9 Representations by

This section deals with parts of representations that are not covered above.
states that 'The *applicant is trying to obscure the full intention of the works he wishes to carry out and the consequences to the adjacent land form.'* Apart from being libellous this is completely untrue.

has (for reasons unknown) become confused with Local Chart Datum. Because the drawings state 'Depths in metres, reduced to Local Chart Datum' he seems to believe that this is some *arbitrary datum* (quote). The fact is that Chart Datum varies around the coast and is correctly referred to as Local Chart Datum for any particular area. Tide gauges in the river refer to Local Chart Datum. This confusion has then led to a belief that a 2.1m wall is to be dredged at the upstream end of the dredge area. He states that our drawing indicates a 1.5m vertical wall.

This is all complete nonsense and the fact is that a 0.5m change in depth will be formed over a sloping area within the dredge boundary.

This is all explained in more detail in the appendix. Having taken further advice we offered to meet to discuss his concerns following our response to his last comments. To date we have not received any further communication.

This is unfortunate and has necessitated the inclusion of this section due to concerns that he will persist with this allegation.

8.1.10 Marine Management Organisation

The Marine Management Organisation has considered these objections and responses and has undertaken expert advice. This is detailed in the MMO's letter in the appendix but the main points are as follows.

Expert advice was obtained from Cefas, Marine Management Organisation (Poole Office), Natural England, Environment Agency, English Heritage, Maritime and Coastguard Agency, Crown Estate, Eastleigh Borough Council, River Hamble Harbour Authority, Royal Yachting Association and Trinity House.

This advice included navigational, environmental and other matters. None of these bodies expressed an objection. The conditions referred to relate to timing, method of working, colregs etc and are detailed in the licence.

Having considered the objections, responses and expert advice the MMO has concluded:

Taking into account all of the above, the MMO considers that the proposed works and their operation will not cause or be likely to result in obstruction or danger to navigation, or have any significant effect on designated sites of environmental significance.

8.2 Potential impacts on navigation during construction

The pontoons will be transported to site by road and the only possible impacts during construction will be from the marine plant.

Marine piling and dredging plant work in this river on an annual basis and river users are well versed in the operations. All of the dredging work is within the current marina footprint so apart from the barges leaving and entering there will be no impact. Similarly the piling work is all within the existing footprint however the piling barge may need to be in a position off the hammerheads for some piling. The size of the vessel is such that this will not impede any vessel capable of navigating upstream of the site.

All vessels will display the correct lights and shapes and maintain a listening watch on VHF in accordance with a LNTM

8.3 Potential navigation impacts during operation

The designed layout follows the existing footprint and there will be no detrimental effects on navigation interests as a result of the development.

8.4 Navigation-related mitigation

The upstream and downstream hammerheads will be fitted with 2 vertical red solar powered navigation lights or as otherwise required by Trinity House.

In order to ensure suitable visibility it has already been agreed with the River Hamble Harbour Authority that no large vessel will be permitted to berth on the outside of a hammerhead (i.e. no single large vessel taking up more than half the length of a hammerhead). This ensures that the vessels are of similar size to those berthed on the jetty berths and visibility will be much better than on most other marinas.

9 POSSIBLE IMPACTS ON INTERNATIONALLY DESIGNATED SITES

The impacts of the proposed marina development will be local in extent and negligible in terms of significance. The calculations of area and volume changes arising from the development are insignificant in relation to the estuary as a whole.

It can therefore be concluded that the proposed marina re-build will not have any adverse direct or indirect effect on any of the features of the SAC.

9.1 Water quality

9.1.1 Potential impacts on water quality due to dredging

Water quality, particularly dissolved oxygen (DO) and suspended sediment (SS) can be affected by dredging operations.

Backhoe dredging plant produces the minimum disturbance of sediment and would be the type of plant employed.

This is standard practice for dredging in this river and accepted by the EA and NE as good practice.

9.1.2 Potential impacts on water quality arising from marina operations

The current management measures will continue to ensure that no significant adverse environmental effects result. Due reference will be made to the Yacht Harbour Association Code of Practice for the Construction and Operation of Marinas and Yacht Harbours and the 'Environmental Code of Practice' published by the British Marine Federation, the Royal Yachting Association and the Environment Agency.

9.2 Possible Impacts of Development

There will be no indirect loss of important habitat (e.g. due to changes in erosion, accretion, suspended sediment concentrations, sediment transport or tidal regime). The proposed mitigation provides a positive impact.

9.3 Possible impacts on birds

Potential impacts on birds can only occur during the construction phase as the works are effectively a replacement of that existing.

9.3.1 Disturbance to birds during construction

Concerns about the potential impacts of the works on migrating salmonids mean that it is unlikely to be possible to phase the marine construction works to avoid the bird over-wintering period. Similar work on the River Hamble traditionally takes place between 15th September and 31st March (inc).

The main concern is for the over-wintering birds between August and March. Typically wading birds feed from around 3 hours after high water to 3 hours before high water. It is anticipated that the dredging works will occur first followed by the piling works. Piling will hence occur in areas distant to the intertidal areas. At the margins the piling is only likely to occur over high water periods thereby minimising any impact.

The distance to the nearest part of the European site (some 500m) means that birds using the SPA will be well beyond the maximum 'escape distance' at which birds are disturbed by visible human activity (typically 200-300m) during the construction period. There will not, therefore, be any direct adverse effect on the integrity of the European site.

The nearest point of the European site is also sufficiently far from the construction site to ensure that noise reaching it from the works is not significant given the context of the existing background noise currently generated by existing use of the estuary and adjacent areas, etc. No direct adverse effect on the integrity of the European site due to construction noise is therefore anticipated.

Existing lighting levels on the estuary, combined with the distance between the works and the protected sites, mean that no adverse effect on the European site due to lighting (during construction or operation) is anticipated.

9.3.2 Mitigation proposals during construction

In order to minimise impacts on potentially sensitive species of noise emanating from the construction process for the marina and shore-based infrastructure, the following mitigation measures are therefore proposed wherever practicable:

Non-percussive (eg. vibro) piling will be used wherever practical. In cases where vibro methods are insufficient to achieve required penetrations then percussive piling will be employed using 'soft-start' methods. In areas near to the shoreline piling will only be carried out over the high water periods or other times when the intertidal habitat is inaccessible to waterfowl.

The piling operation consists of lifting the pile into position (pitching) and then driving it into the sea bed. Each pile takes approx. 20mins to drive. The piling operation is not continuous (unlike sheet piling) and a small number of piles would be driven each day (typically 4-6). This is because after driving the pile the barge has to re-position. Piling operations will only occur during daylight hours (typically 0800-1800 maximum) to further reduce impact. If percussive techniques are necessary it has been agreed with the Environmental Health Department of the Local Authority that this shall only occur between 100-1600.

With the proposed mitigation in place it is considered unlikely that there will be any adverse effect on either SPA interest features or on other bird species using the site.

9.3.3 Disturbance to birds during operation

During operation there will be no change to the current situation so there will be no significant adverse effects due to operational noise are thus anticipated on either SPA interest features or other bird species using the site.

9.3.4 Mitigation proposals during operation

All operational lighting will be directional and low impact.

No adverse effects due to lighting are therefore anticipated either on the SPA bird species or on other species using the site.

9.4 Migrating salmonids

9.4.1 Existing environment

There are two main potential issues with respect to migratory salmonids in the vicinity of the proposed marina development:

-re-suspension of sediment during construction (eg. dredging)

-noise during construction and operation

9.4.2 Re-suspension of sediments

In respect of re-suspended sediments the quantity of sediment suspended will be limited due to the use of a backhoe dredger. This is generally accepted to be best practice and regularly appears as a condition in CPA/FEPA licences.

The technique of 'over-spilling' when loading hoppers will not be permitted.

The resuspension of sediment due to dredging is therefore unlikely to have any significant implications for migratory salmon. With the earlier stated timing period this is accepted practice by both the EA and NE for this estuary.

9.4.3 Noise impacts

During construction there will be a variety of potential sources of noise including piling and dredging.

Non-percussive (eg. vibro) piling will be used wherever practical. In cases where vibro methods are insufficient to achieve required penetrations then percussive piling will be employed using 'soft-start' methods. In order to provide maximum areas for avoidance the piling will be conducted over the high water periods.

It is generally accepted that noise impacts on migratory fish in estuaries can be a concern when piling and dredging. It is for this reason that piling and dredging in this estuary are carried out between 15th September and 31st March.

This often conflicts with the over-wintering wildfowl season but the generally accepted practice is to mimimise the impact on fish and use low noise (i.e. vibro-piling) plant to lessen any impact on birds.

As the proposal is a rebuild of the existing operation there will be no change in the operational noise impacts.

10 ARCHAEOLOGY

The history of the site is that it has been an operational boatyard since 1922. All of the proposed works are within the existing footprint.

The proposed dredge will just remove material that has deposited in the last 20 years or so.

There is no recorded information regarding wrecks at this location. Unless information is available it is accepted standard practice to condition the marine works such that if any artefact should be encountered then work stops until the County Archaeologist has inspected the find. In any event, disposal of such material at sea would not be permitted by the licence. In accordance with good practice a watching brief will be maintained by the dredging crew for any items that may appear.

11 LOCAL COMMUNITY AND OTHER USERS

11.1 Potential impacts on the local community

The proposed rebuild of the marina is such that there will be no change in terms of the local community.

11.2 Potential traffic impacts

11.2.1 Potential traffic impacts during construction

The industrial nature of the site and the mix of current uses are such that traffic associated with the proposed rebuild is unlikely to make more than a marginal difference to either the characteristics or the magnitude of existing traffic flows. The impact of construction traffic is therefore expected to be negligible.

11.2.2 Potential traffic impacts during operation

There will be no change to the current levels of traffic movements.

11.3 Potential noise impacts

11.3.1 Existing noise climate

As indicated above, the proposed works are a rebuild of the existing marina. Due to this environment and the nearby road bridge it has not been considered necessary to take noise measurements.

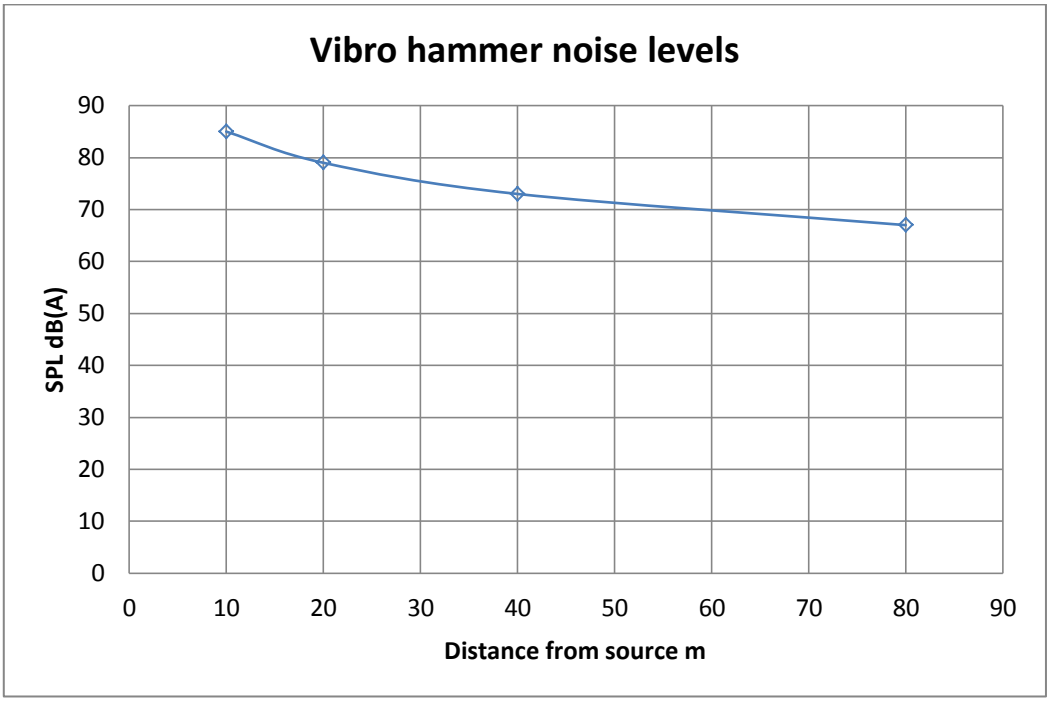
With the current site use and to the best of the applicant's knowledge, no complaints about noisy activities have been received.

11.3.2 Potential noise impacts during construction

With regard to the construction stage, the main potential source of noise is likely to be piling. It is therefore worth noting at this point that the use of vibro- (rather than percussive) piling is likely to be used in order to avoid adverse effects on the behaviour of migrating salmonids.

The piling operation consists of lifting the pile into position (pitching) and then driving it into the sea bed. Each pile takes approx. 20mins to drive. The piling operation is not continuous (unlike sheet piling) and a small number of piles would be driven each day (typically 4-6). This is because after driving the pile the barge has to re-position.

Noise levels for some recent piling at Portland were undertaken for Natural England. The noise levels 100m from the pile were as follows – background 55dB, vibro-piling operation 63dB, percussion hammer 77dB. This demonstrates that the use of vibro-piling and hence limited percussion piling is a significant reduction in noise impact. The graph below shows data from a typical piling hammer.



All piling works will be undertaken during daylight hours to minimise any noise impact.

In the event that substrate conditions require the use of percussive piling, this activity will be restricted to 1000-1600. As a result, and taking into account the existing nature of the site, it is not considered that any limited percussive piling activity would cause a significant adverse impact on either users of the site or the residential properties in the area.

The secondary potential noise impact is that from the dredging operation. Dredging plant is diesel engine driven with substantial silencing systems to prevent any hearing impact on operatives. The crew do not wear any form of ear protection as the noise levels do not warrant it. The same is true for the split hopper barges.

The nearest housing accommodation is some 200m away from the operational dredger with an operational railway line between. Whilst the loading operation only lasts a couple of hours all operational plant will be checked to ensure that their silencers are fully operational to minimise noise impact. It is unlikely that the dredge operation will be audible above normal road traffic.

Maintenance dredging occurs annually in this estuary and noise issues from the dredging plant are very rare.

11.3.3 Potential noise impacts during operation

This is an existing marina and the proposed rebuild will not result in any additional noise impacts.

11.3.4 Mitigation measures for noise

As no potentially significant noise impacts affecting the local community or site users were identified, no mitigation measures are necessary

12 VISUAL IMPACT

12.1 Description

The proposed rebuild overlays the existing marina and there will be no visible difference from either land or sea.

The potential impact of lighting will be avoided by limiting the amount and by the design of fittings to ensure minimal vertical light spillage. In particular, lighting will be directional and low impact to avoid illumination of the inter-tidal mudflats.

13 SUMMARY

The Assessment identified a number of potential impacts, which require mitigation. The table over summarises these potential impacts. Overall, these indicate that there will be no adverse effect on the integrity of the SPA/SAC sites.

Potential impact	Pre-mitigation impact significance	Mitigation requirements or enhancement opportunities	Significance of residual impact	Direct or indirect adverse effect on integrity of European site?
Tidal prism or flow characteristics	Negligible		Negligible	**NO**
Sediment regime	Negligible		Negligible	**NO**
Designated sites (coastal processes)	Negligible		Negligible	**NO**
Direct loss of designated habitats	None		None	**NO**
Indirect loss of designated habitats	None		None	**NO**
Loss of intertidal bird feeding/loafing	Minor	Net gain by exposing covered mudflats	Positive	**NO**
Bird disturbance during construction	Possible impact	- Non-percussive piling wherever practicable	Minor	**NO**
Migrating salmonids (sediment resuspension)	Minor	- Backhoe dredger used to minimise suspension - No over-spilling of hoppers	Minor	N/A
Migrating salmonids (construction noise)	Possible impact	- Non-percussive piling wherever practicable - Seasonal constraints on working practices	Negligible	N/A
Archaeology and heritage	Negligible	- Watching brief during construction	Negligible	N/A
Traffic	Negligible		Negligible	N/A

Noise (construction)	Negligible		Negligible	N/A
Noise (operation)	No change		None	N/A
Navigation (construction)	None	- Notices to Mariners	None	N/A
Navigation (operation)	Negligible	- Navigation lights	Negligible	N/A
Local Economy	Positive		Positive	N/A

14 METHOD STATEMENT

This summary method statement is intended to provide information on the key aspects of the work.

In order to minimise the disturbance from plant the works will commence with dredging at the northern end of the site and proceed southwards. A spud-legged backhoe dredger loading into self-propelled split hopper barges will be used as this generates the least noise and minimises sediment disturbance.

The dredging operation consists of loading a hopper (typically 2.5 hours) which then travels to the disposal site. In line with all other dredging operations in this estuary the works are tidally constrained (i.e. can't work at low water) so some night time operation is anticipated.

As the dredging proceeds the marina construction will commence with tubular steel piles being driven into the sea bed using vibro techniques where practicable. Typically, a small number of key location piles will be driven and the marina pontoons floated into position. The remaining piles will then be driven through the pile guides. This is a standard technique that minimises any need to extract and re-drive piles.

The piling operation consists of lifting the pile into position (pitching) and then driving it into the sea bed. Each pile takes approx. 20mins to drive. The piling operation is not continuous (unlike sheet piling) and a small number of piles would be driven each day (typically 4-6). This is because after driving the pile the barge has to re-position.

Piling operations will only occur during daylight hours (typically 0800-1800 maximum) to further reduce impact. If percussive techniques are necessary it has been agreed with the Environmental Health Department of the Local Authority that this shall only occur between 100-1600.

The combined dredge and construction is expected to be completed within 2 months.