

Littlehampton Maintenance Dredge Protocol and Water Framework Directive Compliance Baseline Document



Summary

The Littlehampton Harbour Board (LHB), the Statutory Harbour Authority (SHA) for Littlehampton Harbour, has compiled this Maintenance Dredge Baseline document in support of the Maintenance Dredge Protocol. The aim of the protocol is to collate relevant information into a Baseline Document to assist operators and regulators seeking, or giving approval, for maintenance dredging activities that could potentially affect European designated sites. In the case of Littlehampton this policy has been applied to nationally protected environmental sites – namely the adjacent Climping Beach Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR) and the newly established Marine Conservation Zone (MCZ) at Kingmere Rocks 3nm offshore.

This Baseline Document provides information to:

Provide all parties wishing to carry out maintenance dredging within the harbour area with the relevant baseline information; and

Provide the information needed to inform the preparation of Water Framework Directive (WFD) compliance assessments in accordance with the Environment Agency's 'Clearing the Waters' guidance.

This Baseline Document concludes that the present maintenance dredging practices are sustainable and not having an adverse effect on the features of the SSSI, the estuary of the River Arun or the adjacent MCZ.

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1. Introduction

1.1 Background

The Littlehampton Harbour Board (LHB) is the Statutory Harbour Authority (SHA) for the port of Littlehampton extending from approximately 100 feet south of the west training wall (Drum Head) and approximately 500 yards either side of this point to Mean High Water Springs (MHWS) on the east and west beaches, and on the River Arun to MHWS extending up to the old Arundel road bridge. Maintaining safe port access for commercial and recreational maritime transport is an important function for Harbour Authorities (HA). This necessitates the maintenance dredging of access channels and potentially berth pockets to remove recently deposited sediment. Most of the dredging occurs at the entrance to the harbour but individual berth operators will also dredge their mooring areas.

1.2 Objectives

Where maintenance dredging has the potential to affect a Natura 2000 (N2K) site, such as a Special Area of Conservation (SAC) or Special Protection Area (SPA) as designated under the EC Habitats Directive 92/43/EEC, the Government considers maintenance dredging to be a 'plan or project' for the purposes of the Habitats Directive. Because of this, maintenance dredging operations in such areas would need to be assessed in accordance with Article 6(3) of the Directive.

A Draft Conservation Assessment Protocol on Maintenance Dredging and the Habitats Regulations 2010 ('Draft Protocol') has been developed to assist port authorities in fulfilling their statutory obligations of devising arrangements which allow the effects of maintenance dredging on N2K sites to be reviewed in a way which does not impose a disproportionate burden on industry, Government or its agencies.

The Draft Protocol was produced in December 2003 and trialled at a number of ports although it has not yet been adopted. It was recommended within the draft protocol that a 'Baseline Document' is prepared, which would draw on existing and readily available information to describe current and historic patterns of dredging in relation to the conservation objectives of adjacent European Marine Sites.

Although there are no N2K sites within the Littlehampton SHA there is an adjacent site with Special Scientific Interest (SSSI) and Local Nature Reserve (LNR) status at Climping Beach as well as a Marine Conservation Zone (MCZ) at the Kingmere Rocks site centred approximately 5nm offshore. This report represents the 'Baseline Document' for the continuation of maintenance dredging in the Littlehampton Harbour SHA.

The lead authority for overseeing the implementation of the WFD within England is the Environment Agency. The Baseline Document therefore provides a basis for the licensing authority to consider maintenance dredge applications.

Production of a Baseline Document is voluntary but without it individual maintenance dredge proposals (in this instance from third party berth operators within the LHB SHA) may require more extensive and time-consuming information gathering and consultation. The Baseline Document therefore aims to provide an agreed basis for the licensing authority to consider maintenance dredge applications. The presumption, in assessing any potential consequences of dredging activity, is that maintenance dredging will continue in line with established practice. To establish existing maintenance dredge activities, this baseline has drawn on existing and readily available information, including the LHBs local consent (section 43) approvals and presents the current and historical patterns within the harbour.

At the outset it is recognised that both capital and maintenance dredging has been an ongoing activity within the port for the safe navigation and berthing of vessels since the Port of Arundel (the predecessor to the port of Littlehampton) was established in 1733.

Historically, dredge disposal activities have been licensed by the regulator, information from the licensing process has been requested.

2. Legislation

Marine navigation dredging (both capital and maintenance dredging) and disposal are highly regulated activities due to their potential to negatively affect the environment if they are not carefully considered and controlled. Dredging activities are primarily licensed under application to the Marine Management Organisation (MMO), an executive non-departmental public body (NDPB) established and given powers under the Marine and Coastal Access Act 2009. Also, where powers to dredge in Harbour Areas are conferred by Acts of Parliament, local works or dredge licences issued by the Harbour Authority may permit dredging (and other activities) within the scope of the special Act under which they are issued. The following section details the legislative context in which this Baseline Document has been drafted.

2.1 National Legislation

Dredge and disposal operations are regulated by the MMO, using powers conferred primarily through the 'Marine and Coastal Access Act' 2009. This Act has established a single Marine Licence, which came into effect on 6 April 2011. Prior to this date dredge and disposal operations were regulated by two separate Parliamentary Acts; the first being the Coast Protection Act (CPA) 1949 as amended by Section 36 of the Merchant Shipping Act 1988. The second Act regulated disposal of dredged material at sea, and was termed the 'Food and Environment Protection Act (FEPA) 1985 (as amended)'. The FEPA licence provided the basic environmental control for sea disposal of dredged material and regulated beneficial use.

2.2 Marine Navigation Dredging Under the Habitats Regulations

It is the Government's view, supported by rulings in the European Court of Justice, that maintenance dredging should be considered as a 'plan or project' for the purposes of the EC Habitats Directive (92/43/EEC), and assessed in accordance with Article 6(3) of that Directive (Defra, 2007). Under Article 6(3) of the Habitats Directive, as enforced in the UK through the Habitats Regulations, an Appropriate Assessment (AA) is required where a plan or project is not directly connected with, or necessary for the management of N2K sites (also known as 'European sites') and where the possibility of a likely significant effect (LSE) on these sites cannot be excluded, either alone or in-combination with other plans or projects. Section 4.1 of the Conservation Assessment Protocol (Defra, 2007) states that the expectation (in the absence of any conflicting evidence) is that a maintenance dredge proposal will not have a LSE on a European site when:

The Baseline Document shows that maintenance dredging is not causing deterioration in the condition of the site, and

There will be little or no change to the situation described in the Baseline Document.

Where this is the case it will not be necessary for the Competent Authority to require further information or to carry out a more detailed assessment for the purposes of the Habitats Regulations.

2.3 Marine Navigation Dredging Under the Water Framework Directive

The EU Water Framework Directive (WFD) (2000/60/EC), which came into force on 22 December 2000, is implemented in the national water regulations of the Member States. The Directive establishes a new approach to the protection, improvement and sustainable use of Europe's rivers, lakes, estuaries, coastal waters and groundwater. The Directive applies to

all surface waters out to 1 nautical mile (nm) seaward of the baseline for territorial waters and to ground waters. For management purposes, surface and ground waters are divided into a number of discrete units termed 'water bodies'. Water bodies relevant to this study are shown below.

X: 501,592;Y: 103,711 at scale 1:40,000

[Other maps](#) [Data search](#) [Text only version](#)

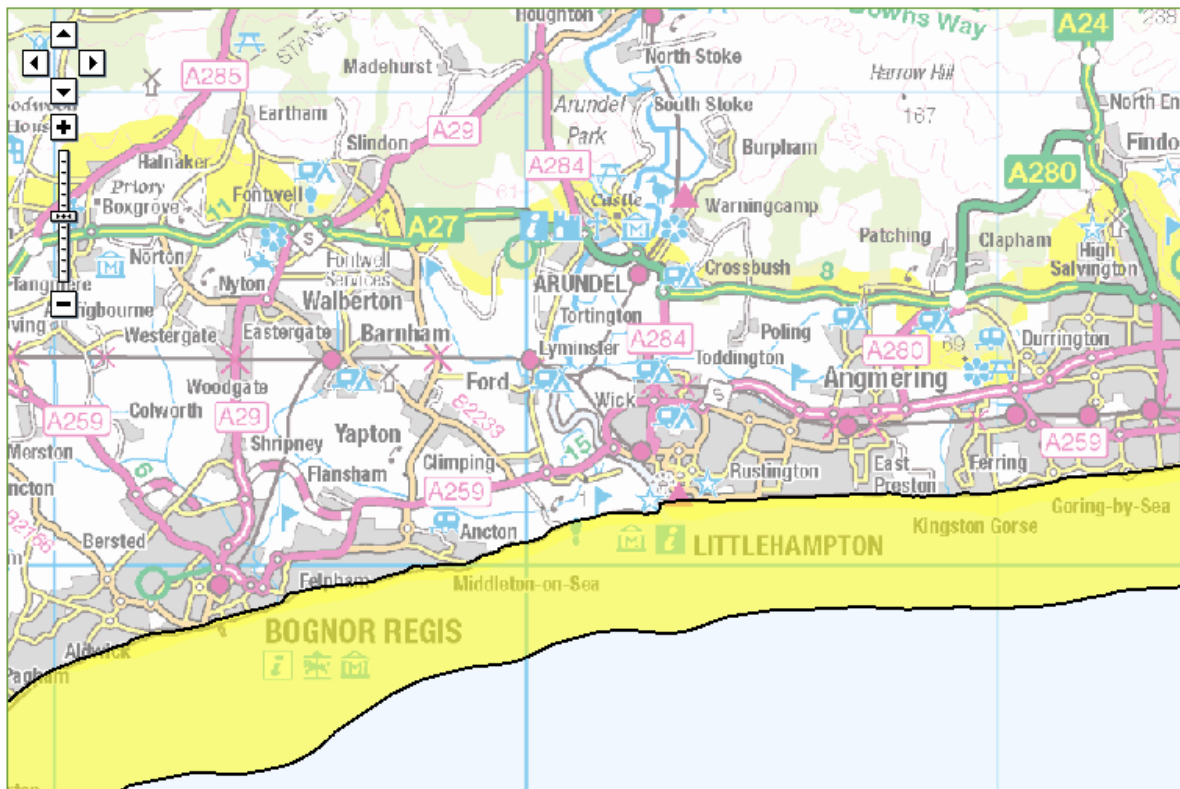


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ARUN		View data
Water Body Name	ARUN	
Water Body ID	GB540704105000	
River Basin District	South East	
Typology	Partly mixed, macro	
Hydromorphological Status	Heavily Modified	
Current Ecological Quality	Moderate Potential	
Current Chemical Quality	Does Not Require Assessment	
2015 Predicted Ecological Quality	Moderate Potential	
2015 Predicted Chemical Quality	Does Not Require Assessment	
Overall Risk	At Risk	
Protected Area	No	
Number of Measures Listed (waterbody level only)	8	

X: 501,462;Y: 103,461 at scale 1:125,000

Other maps [Data search](#) [Text only version](#)



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Sussex		View data
Water Body Name	Sussex	
Water Body ID	GB640704540003	
River Basin District	South East	
Typology	Moderately exposed, Macrotidal	
Hydromorphological Status	Heavily Modified	
Current Ecological Quality	Moderate Potential	
Current Chemical Quality	Good	
2015 Predicted Ecological Quality	Moderate Potential	
2015 Predicted Chemical Quality	Good	
Overall Risk	At Risk	
Protected Area	Yes	
Number of Measures Listed (waterbody level only)	9	

The WFD is implemented in England and Wales through the 'Water Environment (Water Framework Directive) (England and Wales) Regulations 2003' (commonly termed the Water Framework Regulations). The WFD introduces new broader ecological objectives, designed to protect and where necessary, restore the structure and function of aquatic ecosystems themselves and thereby safeguarding the sustainable use of water resources (UKTAG,

2008). Under the Regulations, the Environment Agency is the competent authority for implementation of the Directive in England and Wales. Programmes of measures have been developed through a process of river basin management planning and are set out in a number of regionally based River Basin Management Plans (RBMPs) formally published in December 2009. To help those undertaking navigational dredging and disposal activities to comply with the requirements of the WFD in transitional (estuary) and coastal water bodies, the Environment Agency has published the 'Clearing the Waters' guidance (Environment Agency, 2012).

2.4 Local Harbour Powers

The LHB is the SHA for study area covered by this Baseline Document, and as such, has powers to carry out maintenance dredging for the safe navigation of vessels under the 'Littlehampton Harbour and Arun Drainage Outfall Act 1927'. Section 41 'Power as to dredging & c.' states:

"The Harbour Board may from time to time—

- (a) Alter dredge and scour the entrance channels and waterways of the harbour;*
- (b) Widen deepen enlarge improve and maintain the docks entrances channels and waterways of the harbour and reduce or remove any shoals or accumulations and for that purpose enter into agreements with the owners of land adjoining or in or near the harbour for the purchase of land;*
- (c) Abate or remove obstructions and nuisances in the entrance channels and waterways of the harbour or on the banks thereof;*
- (d) Sell or dispose of any materials raised by them under this section or lay the same behind any piers or structure or otherwise use such materials for the purpose of making altering repairing and maintaining the banks and foreshore of and improving the harbour; and*
- (e) Execute all other works which shall be necessary or proper for rendering the harbour safe and commodious and for carrying out the purposes of this Act:*

Provided that no materials raised under the provisions of this section shall be deposited in any place below the high-water mark otherwise than in such position and under such restrictions as may be fixed by the Board of Trade [now administered by the MMO]."

These powers enable the LHB to carry out maintenance dredging in its SHA, however, consent is still required from the MMO in the form of a Marine Licence in order to deposit any dredged material at sea.

The harbour also has powers to approve works locally. Section 43 'Penalty for erections without consent of harbour Board.' states:

"Subject to the provisions of this Act a person shall not make any embankment or erect any building or work in the bed or on the banks of the harbour or drive any pile therein without the written consent of the Harbour Board which consent shall be given unless in the opinion of the Harbour Board any such embankment building work or pile would interfere with or endanger the use of the waterways of the harbour. If any person acts in contravention of this section he shall be liable on summary conviction to a fine of twenty pounds and to a further penalty of forty shillings for every day on which the contravention continues after conviction:

If the Harbour Board shall refuse their consent to any such embankment building or work or to the driving of any piles in the bed or on the banks of the harbour, or as a condition of such consent shall require and modification or alteration therein any person dissatisfied by such refusal or by such modification or alteration shall notify his dissatisfaction and the reasons therefore in writing to the Harbour Board within twenty-eight days of such refusal or consent with modification or alteration as the case may be and thereupon a difference shall be deemed to have arisen between the Harbour board and such person which shall be determined by an arbitrator to be appointed in default of agreement by the Board of trade[now administered by the MMO] upon the application in writing of either of the parties and the provisions of the Arbitration Act 1889 or any statutory modification thereof shall apply to such arbitration.

Provided that nothing in this section shall affect any rights or powers of the Postmaster-General under the Telegraph Acts 1863 to 1926:

Provided also that nothing in this section shall affect any rights or powers of the Railway Company.”

3. Coastal and Fluvial Processes

There are two main sources of sediment in the LHB SHA.

3.1 Fluvial Sediment

Fluvial sediment is deposited throughout the harbour by the River Arun. This is generally confined to the accumulation of light mud at edge of the main channel below MHWs and in basins and moorings above MLWS. The river is notoriously swift due to its channelled and artificially established course and as such is self scouring in the main channel or fairway.

3.1 Coastal sediment

Coastal sediment in the form of shingle is provided by the process of long shore drift from the West Beach at the mouth of the river. Shingle makes its way along the West Beach until it is gathered by the West Works training wall structure. At the landward base of the West Works (where it meets the West training Wall) a large shingle bank can appear due to the continual overtopping and occasional breaches of the wooden structure.

Shingle is then transported seaward along either side of the West Works gathering at the seaward end of the training wall structures (West Works and East Training Wall or Dicker Works) before being pushed around the East Beacon and over the southern section of the Dicker works and accumulating in a shingle bank extending from the East Beacon to the third groyne on the East Beach.



4. Dredging Information

The LHB as the SHA has a statutory duty to monitor and the authority to improve or maintain charted depths of water in navigable channels within its jurisdiction, in addition to the maintenance of its operational berthing facilities (both commercial and leisure). This is achieved through regular planned maintenance dredge campaigns and additional capital dredge campaigns if and when required.

In addition to dredging by the LHB, there are around 5 other organisations which carry out, or have carried out maintenance dredging within the last 10 years within the study area.

Where available, information on third party dredge operators and activities including their locations, methods, volumes and times has also been obtained. The following sections, therefore, describe the historic and current known dredge activities, outlining dredge quantities, dredge techniques and identifying disposal sites where appropriate.

4.1 Historic Dredging

4.1.1 Capital Projects

Capital dredging can be defined as the excavation of material to deepen or create navigational channels and berths to provide additional harbour infrastructure or provide access for deeper draught vessels, it also applies to removal of areas of the seabed during construction works. A capital dredge project within the SHA would require local consent from the HA (locally known as a Section 43 Consent) as well as a Marine Licence from the MMO.

S43 Licences and Applications:

There is no record of local consents issued by the LHB for capital projects.

MMO – Public Register and Other Historic Records:

There are no records of capital dredge works on the MMOs Public Register. However local research has contributed the following:

LHB

The LHB invested some £615K on capital dredge work at the entrance to the harbour to allow increased tidal access to the port for a commercial operator. This work was carried out by Van Oord ACZ Ltd in Jan-April 2001 and covered by FEPA licences 31174/01/2 (for disposal of up to 73,050 tonnes at the Shoreham disposal area WI031) and 31175/01/2 (for deposition of up to 20,000 cubic metres on the LW mark at Rustington).

It is estimated that by completion around 32,000 cubic metres of material were dredged of which 20,000 tonnes was deposited on the foreshore at Rustington.

LYC

The predecessor to the LYC the Littlehampton Motor Sailing Club (LMSC) conducted backhoe dredging at the LYC basin in 2007/8 and again in 2008/9. It is unclear what volumes were removed or what depths were achieved, but material was piled behind the black shed on land now controlled by LYC and some subsequently moved to the Littlehampton Golf Club. There is some suggestion that this material was considered by the EA to be contaminated.

AYC

The basin outside the AYC clubhouse was excavated in 1981 to 1.5m above chart datum.

Littlehampton Marina/The Shipyard

No information has been received from the Littlehampton Marina or The Shipyard.

There are no extant Marine Licences or Marine Licence Applications for capital dredge projects within the harbour.

4.1.2 Maintenance Projects

Maintenance Dredging can be defined as removal of accumulated sediments from harbour channels and berths to ensure a safe depth of water for navigational purposes. The “10-year rule” means that areas that have not been dredged within the last 10 years cannot be dredged again without being considered as a capital project.

S43 Licences and Applications

There are six historic local consents on record for maintenance dredge activity in the harbour. Three remain extant as of January 2015.

Organisation	Activity	LHB s43 Ref	Start Date	End Date	Status
AYC	Bed levelling, Basin	04/10	13 Dec 10	31 Mar 12	Expired
AYC	Bed levelling, South Yacht Berth	01/12	30 Jan 12	31 Mar 12	Expired
Osborne of Arun	WID, West Bank Moorings	03/13	17 Jun 13	16 Jun 18	Extant
AYC	WID, Basin	07/13	8 Oct 13	8 Oct 18	Extant
AYC	Bed levelling, South Yacht Berth	06/14	11 Nov 14	30 Nov 14	Expired
AYC	Bed levelling, South Yacht Berth	03/15	30 Aug 15	30 Aug 20	Extant
Littlehampton YC	WID (small scale) at LW frontage	02/16	6 Jul 16	5 Jul 21	Extant

MMO – Public Register

A number of marine projects have been licensed in the harbour and these can be found by searching for Arun and Littlehampton on the MMOs Marine Case Management System – Public Register.

The AYC has also submitted a notification of exempt activity for maintenance dredge work at the South yacht Berth and Ballast Wharf. Maintenance works carried out by marina operators are covered by an exemption providing that they do not exceed 500 cubic metres per campaign and do not total more than 1500 cubic metres per annum.

<https://marinelicensing.marinemanagement.org.uk/mmo/fox>

None of the projects on the Public Register were concerned with dredge activity. See table below.

Case Ref ↑↓	Application Type ↑↓	Applicant Name ↑↓	Activity Type(s) ↑↓	MMO Region ↑↓	Status ↑↓	Submission Date ↑↓	Decision Date ↑↓	Licence Issued Date ↑↓	Actions
34917/100804	Application	Arun Yacht Club	Construction	South Eastern	Completed	12-AUG-2010			View Application Download Application
MLA/2012/00224	Application	ARUN YACHT CLUB LTD	Construction	South Eastern	Completed	16-MAY-2012	21-AUG-2012	21-AUG-2012	View Application Download Application
MLA/2012/00383/4	Application	OSBORNE OF ARUN GROUP (MANAGEMENT) LIMITED	Construction, Removals (inc. Grab Samples)	South Eastern	Completed	10-SEP-2012	19-JAN-2015	19-JAN-2015	View Application Download Application
MLA/2013/00016	Application	ARUN YACHT CLUB LTD	Construction	South Eastern	Completed	21-JAN-2013	05-MAR-2013	05-MAR-2013	View Application Download Application
MLA/2013/00039	Application	ARUN YACHT CLUB LTD	Construction	South Eastern	Completed	01-FEB-2013	15-APR-2013	15-APR-2013	View Application Download Application
MLA/2013/00317/1	Application	ARUN DISTRICT COUNCIL	Construction, Removals (inc. Grab Samples)	South Eastern	Completed	09-AUG-2013	29-NOV-2013	29-NOV-2013	View Application Download Application
MLA/2013/00475/1	Application	ARUN YACHT CLUB LIMITED(THE)	Construction, Removals (inc. Grab Samples)	South Eastern	Completed	13-DEC-2013	05-MAR-2014	05-MAR-2014	View Application Download Application
MLA/2014/00041/3	Application	ARUN YACHT CLUB LIMITED(THE)	Construction	South Eastern	Completed	29-JAN-2014	06-MAY-2014	06-MAY-2014	View Application Download Application
MLP/2013/00095	Pre-Application (Screening Request)	ARUN DISTRICT COUNCIL	Construction	South Eastern	Completed	04-APR-2013	19-JUL-2013		View Application Download Application

Case Ref ↑↓	Application Type ↑↓	Applicant Name ↑↓	Activity Type(s) ↑↓	MMO Region ↑↓	Status ↑↓	Submission Date ↑↓	Decision Date ↑↓	Licence Issued Date ↑↓	Actions
MLA/2014/00436	Application	LITTLEHAMPTON HARBOUR BOARD	Construction of new works, Maintenance of existing works	South Eastern	Completed	11-SEP-2014	17-DEC-2014	17-DEC-2014	View Application Download Application

4.2 Current Dredge Practice

4.2.1 Conservancy Dredge Activity

Restricted to entrance to the harbour and fairway – which is defined as “the channel below the level of low water which is navigable by all vessels, including small vessels” in the LHB General Directions issued 7th September 2015.

LHB dredge effort at entrance Bar:

The LHB carries out a small amount of bed levelling on the bar to maintain the 0.9m drying minimum, but this activity is limited by lack of take-up space to plough into.

LHB dredge effort at Shoal Bank:

The LHB removes around 6000 tonnes of shingle per annum from the river channel by the West Beach car park at the base of the West Works. This material overtops the west training wall and West Works during autumn and winter storms and material can be either sold on or (more normally) contributed to the EA shingle recycling effort that takes place annually on the West Brach (see below).

The LHB also maintains a groyne on the West Beach in order to slow the movement of material towards the west works.

Volumes of material excavated from the river are outlined below:

Campaign	Contractor	Volume Removed (Tonnes)	Volume Recycled (Tonnes)		Yearly Total (Tonnes)
Apr-13	Lafarge Tarmac	2,000	0	2013	2,000
Mar-14	Lafarge Tarmac/EA	4,000	4,000		
Dec-14	Lafarge Tarmac/EA	2,000	2,000	2014	6,000
Dec-15	Land & Water/EA	6,000	6,000	2015	6,000
Feb-16	Dudmans	10,000*	6,000	2016	10,000

5,300 tons from the river, 4,700 from the beach with 6000 tons being sent to Elmer for EA emergency coastal defence works

EA effort at West Beach:

The Environment Agency have legal agreements “for ever after to maintain improve and construct such sea defence works as are from time to time reasonably necessary for the protection of the ... estate at Bailiffscourt” between two areas near Poole Place to the west and Atherington car park to the east; and to “take over responsibility for sea defences over the Bailiffscourt frontage and maintain the same in a satisfactory state of protection and repair.”

As a result annual shingle recycling is carried out taking material from the river mouth end of the West Beach and transporting it to the Elmer and Climping frontages.

The LHB co-ordinate with this activity so that material taken from the river can be used in this process.

4.2.2 Operational Dredge Activity

Defined as berths and approaches as per individual business case associated with the operation of individual mooring facilities.

Maintenance – LHB

Pier Road, Town Quay, Dukes Wharf, Workshop Pontoon. These moorings are periodically ploughed and in house WID activity takes place in specific areas as required. Dukes Wharf was also dredged by the Van Oord WID vessel ODIN in autumn 2013.

Commercial Quays. The LHB owned commercial quays (Railway Wharf and UMA Wharf) are periodically ploughed. The Tarmac owned excavator is also used periodically to maintain depths and incline on these NAABSA (Not Always Afloat But Safely Aground) berths.

Maintenance – Other

LMSC/LYC

Small scale water injection dredge activity has taken place on moorings controlled by the LMSC/LYC; this activity is likely to be covered by small scale exemptions in place for marina and berth operators.

AYC

Since capital excavation of the AYC Basin in 1981 to 1.5m above chart datum a maintenance dredge has taken place approximately every five years using plough or WID techniques. (LHB s43 ref 07/13 refers.) In winter 2013/14 approximately 6,000 cubic metres were removed from the AYC basin using the Van Oord WID vessel ODIN. WID using a saltwater pump around the keels of boats has also taken place to allow vessels to take the ground safely at low water.

The AYC North Moorings (aka Ballast Island and the South Yacht Berth) have been dredged in October 2015 (LHB plough vessel ERICA LHB s43 ref 03/15 refers) and in 2009. A seawater pump has also been used on a regular basis to clear small amounts of silt from the berths to allow vessels to sit in the mud at low water and to keep the pontoons level.

Notifications of exempt activity have been submitted to the MMO for maintenance activity at the AYC North Moorings and Basin.

Osborne of Arun

Small scale water injection dredge activity has taken place on moorings controlled by Osborne of Arun; this activity is likely to be covered by small scale exemptions in place for marina and berth operators. (LHB s43 ref 03/13 refers.)

The Shipyard

Have not responded to the LHBs request for information.

Littlehampton Marina

Have not responded in writing to the LHBs request for information, however, it is known that agitation dredging has taken place consistently since capital excavation of the Marina site using in-house plant. It is likely that this activity is covered by small scale exemptions in place for marina and berth operators. It is understood that a notification of exempt activity has been submitted to the MMO.

4.3 Dredging Methods

4.3.1 Trailer Suction Hopper Dredging

TSHD uses suction to raise loosened material from the bed through a pipe connected to a centrifugal pump. Suction alone is normally sufficient for naturally loose material, such as recently deposited material within deepened areas such as the approach channel or berthing areas. TSHD is most efficient when working with fine substrates such as mud, silt, sand and loose gravel as the material can be easily held in suspension. Coarser materials can also be dredged using this method, but with a greater demand on pump power and with greater wear on pumps and pipes. Material dredged by TSHD then requires depositing either within a licensed sea or land disposal site usually by direct bottom dumping (at sea) or through pumped discharge (to a land disposal or beneficial use site).

4.3.2 **Backhoe Dredging**

Backhoe dredging involves a vessel which has one or more dredging cranes mounted around a receiving hopper or barge. The cranes are fitted with grabs that pick up material from the seabed, and discharge the material into the hopper or barge. The backhoe dredger is usually held in position while working, by anchors and moorings. However, a few are fitted with spuds, or piles, which can be dropped onto the seabed whilst the dredger is operating. Once loaded, the vessel or barge moves to a disposal site to discharge material, which is normally achieved through direct placement at the site by direct bottom dumping.

Backhoe dredging in Littlehampton was carried out by Van Oord to dredge the bar in 2001 using the dredger IJZEREN HEIN, barges SEINE and THAMES and the tug BEVER.

Backhoe Dredging from Shore: Backhoe dredging from shore involves positioning an excavator ashore and removing material either to stockpile or direct to transport for disposal

Backhoe dredging from shore has been carried out by contractors including Mackley, Land and Water and Tarmac on behalf of the LHB to remove the Shoal bank at the West Works/Training wall; and was also used to excavate the LMSC/LYC basin.

4.3.3 **Water Injection Dredging**

WID consists of injecting large amounts of water at low pressure into surface sediments on the seabed. This generates a high density layer on the seabed, normally being a maximum of 1.0 m deep, with the highest density part of the cloud being 0.5 m above the bed. The density cloud acts as a fluid layer and flows over the bed through the action of gravity along the seabed contours. The aim of this form of dredging is not to suspend sediments within the water column, but rather to move sediments from one area to another, and thus keep the sediment within the system. Some re-suspension of fine sediment fractions often occurs locally to the WID site, or where tidal flows are higher thereby mobilising material. If the density cloud flows over a pronounced change in bed gradient, material also has the potential to be re-suspended.

WID dredge activity in Littlehampton has been carried out using the Van Oord vessel ODIN.

4.3.4 **Agitation Dredging**

Agitation dredging is similar to WID in that light material is moved from the seabed using moving water. The use of hoses, lances, moored vessels ('propwashing') or the Marinas diesel pump are all forms of agitation dredging. It is best used for regular low volume maintenance work.

4.3.5 **Plough Dredging (Bed Levelling)**

Plough dredging utilises a tug equipped with a plough unit. The plough is lowered to a predetermined depth and is used to drag sediment along the seabed. Ploughing is typically used in confined areas due to the small size and manoeuvrability of the vessel, moving material from inaccessible areas such as dock entrances, corners or complicated areas of bathymetry to areas accessible by TSHD or WID vessels, or is used for bed-levelling purposes only. Ploughing is often used in combination with TSHD operation to smooth out/fill in drag head furrows to achieve a more even bed level. Any material above the nominal maintained level (high spots) could pose a

danger to the safety of navigation. As with WID, ploughing should not typically lead to significant re-suspension of sediment in to the upper water column, but if the sediment ploughed is soft it may be sufficiently disturbed to raise smaller sediment fractions into suspension

4.3.6 **Cutter Suction Dredging**

A cutter suction dredger is a stationary or self-propelled vessel that uses a rotating cutter head to loosen the material in the bed ('cutting'). A suction inlet located beneath the cutter head (known as the suction mouth) is connected by a suction tube directly to one or more centrifugal pumps. The vacuum force at the suction inlet sucks up the loosened material. The suction tube and cutter head are attached to a ladder. The ladder with cutter head is positioned at the fore of the vessel. On the aft side, the cutter generally has two spud poles. One spud pole (the auxiliary spud) passes straight through the vessel, while the other is mounted on a movable spud carriage, which can be moved lengthwise along the vessel or pontoon. Steel cables are used to move the ladder or cutter head back and forth, with the spud in the spud carriage as the centre of each concentric circle that it describes. Moving the spud carriage causes the cutter suction dredger to move as well ('stepping'). The cutter suction dredger discharges the dredged material directly to shore via a floating pipeline or into a barge with a special loading system.

5. Sediment Quality

Sediment analysis was carried out by the LHB prior to Shoal Bank clearance in Apr 13 and again by the AYC prior to WID work at the AYC Basin in Oct 13 (see LHB s43 ref 07/13 for details). Results showed sediment to be within normal limits for contaminants.

There is some suggestion that material excavated by the then Littlehampton Motor sailing Club (LMSC) by backhoe dredging at the LYC Basin in 2007/8 and again in 2008/9 was considered by the EA to be contaminated.

6. Bathing Water Quality

The East Beach adjacent to the river mouth, and partly falling within the Littlehampton Harbour SHA, is a designated bathing water. The area is predominantly a groyned, shingle beach but with gently shelving sand exposed at low water. A promenade sits above the beach with a large grassed area behind. The River Arun crosses the beach at the western end of the bathing water.

The 2015 classification for Littlehampton was Good under the Bathing Water Directive. Classifications are updated annually but are based on water quality monitoring results across the preceding 4 years. The Bathing Water season runs from mid-May to the end of September so any impact on water quality from dredging activities would be reduced if they take place outside of this period.

There was a sewage related incident 27-31 August 2014 close to South Terrace, Littlehampton. The Environment Agency worked closely with Southern Water to resolve this.

7. Licence Information

7.1 LHB Licence Information

There are no capital dredge licences in place. It is not felt that the LHB has the power to conduct capital works under its statutory exemptions derived from its establishing Act. At any rate any capital project undertaken would be likely to require disposal at sea and therefore require a Marine Licence.

An exemption from the normal licensing requirement derived from the ports establishing Act is used for backhoe dredge operations at the Shoal bank, entrance Bar and commercial berths and for maintenance activity conducted at LHB berths and elsewhere in the river.

Section 75 of the Marine And Coastal Access Act “Exemptions for certain dredging etc. activities” is intended to allow a harbour authority to employ a contractor to undertake a dredging activity of an area the harbour authority wishes to dredge if they do not have means to do so themselves. It does not cover the case where a person has been instructed to undertake a dredge due to a harbour authority using a power to issue a direction as the qualifying part is “on behalf of”.

A yacht club residing within a harbour authority’s area cannot use section 75 unless the harbour authority has contracted, or entered into another form of private agreement, them to undertake the dredging on the harbour authorities behalf.”Following advice from the MMO, the exemption used for maintenance dredge operations by the Harbour Authority may be extended to other operators on hire of LHB vessels if appropriate but to qualify for the LHBs exemption, any dredging undertaken by a third party mooring provider within the harbour would have to be on behalf of the LHB.

7.2 Current Non-LHB (Third Party) Licence Information

There are no extant Marine licences for dredge activity in the harbour, but the AYC have submitted a Notice of Exemption for work in the AYC Basin and at the South Yacht Berth and Ballast Wharf (aka AYC North Moorings).

Local Consent (s43) is in place for maintenance activity at AYC Basin and North Moorings and the Osborne of Arun West Bank Moorings adjacent to the Timber Docks.

8. Environmental Information

8.1 Conservation and Designations

The nature conservation importance of Littlehampton and the surrounding area is recognised through a number of protected sites. The following sections provide further information on each of the relevant protected sites.

8.1.1 Site of Special scientific Interest (SSSI)

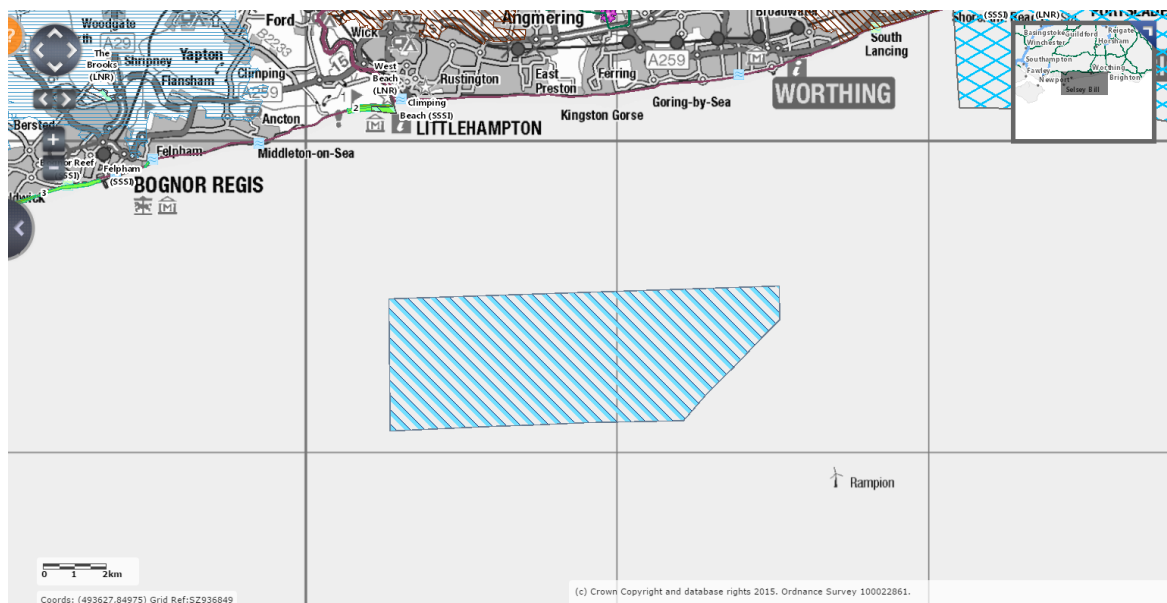
The dune system and foreshore at Climping are an [SSSI](#)

8.1.2 Local Nature Reserve (LNR)

And the dunes in the area are also designated as an [LNR](#).



8.1.3 Marine Conservation Zones (MCZ)



Offshore a [MCZ](#) has been established at the [Kingmere Rocks](#) chalk outcrop.

8.1.4 **Water Quality – Bathing Waters Directive**

The Littlehampton [East Beach](#) is a designated bathing area.

8.1.5 **Recent EIA**

A full [EIA](#) has recently been conducted by the EA as part of the [Littlehampton East Bank Tidal Flood Defence project](#) completed in Spring 2015.

8.1.6 **Consultation with Natural England**

Following consultation, Natural England have confirmed the view that that the dredging works undertaken within the Arun River and Estuary are unlikely to have any detrimental impacts on the adjacent Climping Beach Site of Special scientific Interest.

In addition, and based on the understanding that the dredged material is mainly recycled as part of EAs flood defence works and not deposited out to sea, Natural England have not identified a pathway by which impacts from maintenance dredging activities would affect the interest features of the Kingmere MCZ and are therefore confident that the works will not hinder the conservation objectives of the site.

Where works entail access onto the Climping Beach side of the river (west side) there is potential to impact on the features of this site if appropriate working methodology is not complied with.

Sanderling is a notified SSSI feature at this site, the conservation status is of concern and the evidence suggests that the Sanderling population decline is being influenced, at least in part, by site specific factors. It is therefore recommended that beach recycling activity does not occur during the core winter months of December, January and February.

Natural England's Assent for Environment Agency annual recycling work has recently been revised to avoid impacts to overwintering Sanderling as well as the impacts to vegetated shingle. It would be entirely appropriate if LHB dredging operations which involved access to Climping Beach SSSI also took into account these conditions.

The following restrictions have been agreed as suitable for operations to remove shingle from the river at West Beach adjacent to the SSSI/LNR and are in line with the restrictions placed upon the EA.

“Suitable conditions:

All works vehicles needed to undertake the work should be confined to the immediate area around the groyne and all operatives made aware of the sensitivities of the site – to avoid damage to shingle vegetation and natural beach profile.

Recycling works which impact on or cause disturbance to the intertidal sandflats should avoid the peak overwintering period for Sanderling – that is December November and January.

Single recycling works should be avoided during the summer months to allow the beach profile to recover and development of annual vegetation along the driftline, a characteristic feature of the vegetated shingle community.”