Appendix 1 to Report 530/2005

PROPOSED FLOATING DRY DOCK AT BRIXHAM

ENVIRONMENTAL REPORT

JANUARY 2001

PROPOSED FLOATING DRY DOCK AT BRIXHAM

1. INTRODUCTION

The Brixham Docking Co Ltd (BDCL) are proposing to provide a floating dry dock in Brixham Harbour. At present no such facilities exist at Brixham, with the slipway not being maintained. The recent closure of the Phillips Yard at Noss, River Dart, means vessels requiring maintenance work on their hulls or ionic protection systems need to travel to Newlyn, Shoreham or Holland.

Future plans for Brixham Harbour include a new Northern Arm Breakwater and demolition of the existing fuel jetty due to its poor structural condition. At present the MOD moors a barge alongside the jetty, but there are plans to move it.

Although the dock is proposed to be located alongside the breakwater no vehicular access will be allowed along this route.

On 25 June 2000 BDCL formally instructed Scott Wilson to review their proposals and advise on the engineering and environmental aspects. Following this study a number of environmental issues were highlighted for further investigation. In particular, noise, water/waste and landscape and visual issues have been identified as areas of potential concern. This report addresses these environmental concerns in more detail.

2. THE PROPOSED FACILITY

2.1 Floating Dry Dock

BDCL have identified an available floating dry dock which could be towed to Brixham and operated as a maintenance dock for local vessels. The dock was constructed from steel in the 1940's and is presently moored in Holland.

The overall dimensions of the dock are as follows:

Length	43.89 m
Beam	12.80 m
Height	7.00 m

In operation the draught of the dock is estimated to vary between 1.0 metre and 4.0 metres.

The floating dry dock is an un-powered vessel and will be towed into the harbour. It will be moored to new posts which will be sunk as part of this proposal.

The vessel has no power generation facilities and being a dumb vessel has no requirement to store fuel oil on board. Power supply for the flooding and emptying of the dock will need to be shore based, using a specially provided generation set located on the adjacent quay.

The facility will be able to accommodate all of the 98 vessels in the fishing fleet at Brixham, which include 26 which are over 25m. This is significant as vessels over 25m can be painted with anti-fouling paint which contains tributyl-tin (TBTs). The use of TBTs in paints is a prescribed process which requires IPPC (Integrated Pollution Prevention and Control) consent from the Environment Agency.

2.2 Engineering Options

BDCL envisaged a sheltered haven for the dry dock to enable working throughout the year without the wave climate restricting operations. To achieve this, tubular piles could be embedded into the seabed at suitable intervals and sheet piles installed to provide a wave screen between the supporting piles. The alternative is to secure the dry dock on isolated piles and locate it in an area sheltered from most wave action, accepting some down time in poor weather conditions.

A walkway spanning from the existing jetty to the floating dock is required for pedestrian access. No vehicular access along the breakwater is permitted. It is proposed that generators for the dock are mounted on the existing jetty.

All access to the dock for works and equipment will be by boat, and the walkway will be used for emergencies and access to the generators. Provision must be provided for mooring this vessel.

2.3 The Preferred Scheme

The 'isolated piles' solution was considered to be the best option. This scheme provides a light structure at a comparatively low capital cost. By minimising the area of materials in the water the wave forces are considerably reduced. This is the principal adopted by suspended deck piled jetties and piled navigation aids.

Therefore the potential for providing isolated piles to moor the floating dock was examined.

Preliminary designs indicate that only two 1000mm diameter piles will be required to moor the vessel. The restraining system required to allow unrestricted movement up and down the piles for the range of the tide is feasible but will be the subject of detailed design. Clench plates provided on the vessel will provide means for fixing the guides.

Advantages

(i) Provides a functional and economical design.
(ii) Fewer piles is likely to attract lower rental fees from the Crown Estate Commissioners.
(iii) Forces on structure are significantly reduced.

Disadvantages

(i) The lack of protection around the dock is likely to lead to some downtime during the year.

3 ENVIRONMENTAL SCOPING REPORT

3.1 Introduction

In the feasibility Study Report (July 2000) Scott Wilson identified a number of environmental issues which required further consideration. These are noise, water treatment / waste disposal and landscape / visual impacts. This chapter addresses these issues is more detail, assesses potential impacts and identifies further work that is required.

3.2 Noise

Introduction

This section describes a preliminary noise assessment that has been carried out for the proposed Dry Dock Facility. Due to time limitations, a noise survey to establish the existing noise climate has not been carried out. However absolute noise levels have been calculated at the closest sensitive receiver to the facility and the potential for impacts has been assessed. Impacts have been assessed for the construction period and during operation.

During the construction phase the driving of piles will represent the main source of noise. The duration of the piling operation will be limited, up to one week.

During operation work being conducted on the vessel will include scraping of ships bottoms, repainting, shot-blasting, grinding, welding and repair work to hulls and other marine engineering work that requires vessels to be removed from the water.

Methodology

Standard methodologies have been used to calculate noise levels that will be generated from the construction and operation of this facility. (It should be stressed however that background noise levels have not been taken into account):

<u>Construction</u>

a) The closest sensitive receiver has been selected for assessment (the Astra-Zenica Environmental Laboratory which is approximately 500m from the facility);

b) For the construction assessment, each phase of the construction period has been assessed. The noisiest operation will be the piling, which will take place for approximately 1 week during phase 1.

c) A recognised model, based on BS5228, called 'SiteNoise' has been used to calculate the construction noise level.

d) The predicted levels will be compared to background levels (Leq). In this case, as no background levels have been taken, typical daytime levels for a working harbour (Newlyn) have been used as an illustration.

Operation

a) The closest sensitive receiver has been selected for assessment (the Astra-Zenica Environmental Laboratory which is approximately 500m from the facility);

b) For the operational assessment, the noisiest operations – shot-blasting and angle-grinding have been selected for assessment as they will represent a worst-case scenario. It should be noted that these operations are carried out on an infrequent basis.

c) Recognised acoustic formulae have been used for the operational assessment

d) The predicted levels will be compared to background levels (L_{90}). In this case, as no background levels have been taken, typical daytime levels for a working harbour (Newlyn) have been used as an illustration.

The noise level of the shot blasting (108.6 dB(A) at 2 metres) has been obtained from our internal database of measured noise levels, while grinding (87 dB(A) at 10 metres) has been extracted from BS 5228 Part 1, Table C6 Reference Number 50. This is a noise level for grinding concrete, however it is considered a reasonable substitute for an actual measurement of grinding steel.

Operational Time

BDCL has confirmed the anticipated operating hours of the facility as follows:

- Monday to Friday 08.00 – 17.00
- Saturday 08.00 – 13.00

In emergencies, work outside these hours may be required.

Results

Table 3.1 details the predicted L_{Aeq} noise levels during construction and operation (shot-blasting and grinding). These levels include a + 2.5 dB façade correction (due to reflected noise). The noise levels are predicted at the nearest noise sensitive receiver to the facility – the Astra-Zenica laboratory, 500 metres SW of the proposed facility. All other sensitive receivers are marginally further away from the facility and thus the noise levels will be lower than those predicted below.

Table 3.1 Predicted L_{Aeq} noise levels – no mitigation

Noise Source	Predicted Noise Level in dB(A) Leq
Construction – Phase 1*	61
Construction – Phase 2*	54
Construction – Phase 3*	57
Operation – Shot Blasting+	66.1
Operation – Grinding+	58.5

*- 1 hour noise level
+- maximum noise level

In these calculations, consideration has not been given to the barrier effect that will be provided by the structure of the dry-dock facility. The work will effectively be carried out in a 'box like' enclosure, and as a result provide approximately 10 dB shielding. However, as a very conservative estimate, the facility will create a 6 dB reduction in noise levels. Hence the actual noise levels, taking this into account are given in Table 3.2.

Table 3.2 Predicted L_{Aeq} noise levels – taking barrier effect into account

Noise Source	Predicted Noise Level in dB(A) Leq
Construction – Phase 1*	61
Construction – Phase 2*	54
Construction – Phase 3*	57
Operation – Shot Blasting+	60.1
Operation – Grinding+	52.5

*- 1 hour noise level
+- maximum noise level

Typical noise levels to compare these predictions to have been derived from a similar small fishing harbour – Newlyn. Leq levels at Newlyn were found to be 60dBA, whilst L_{90} levels were around 55 dBA. These are fairly typical ambient noise levels for a small fishing harbour.

Accepting this assumption (with regards to background – ambient noise levels), it can be seen that there will be no significant increases in noise levels at the Astra-Zenica Environmental Laboratory. As all other residential areas are further away than the laboratory, the same conclusion applies.

Conclusions

Essentially, the dry-dock facility is remote from residential areas and as such, operations taking place in the facility will not represent a major source of noise at surrounding residential areas. No further Assessment is considered necessary.

3.3 Water Treatment / Waste Management

Introduction

This section addresses potential water quality impacts in the vicinity of the proposed dry-dock arising from the construction and operation of the facility. Specifically, this includes:

- impacts on water quality during construction;
- impacts on water quality from the operation of the dry-maintenance facility.

Consultation and Legislative Requirements

Integrated Pollution Prevention Control

In 1999 the Pollution Prevention and Control Act came into force. The Act is implemented in England through the Pollution Prevention (England and Wales) Regulations 2000. As the dry dock facility will maintain boats of over 25m, which are likely to be painted with anti-fouling paint which contains tributyl-tin (TBT), the facility will require IPPC Consent from the Environment Agency. This process will take a minimum of 6 months – around 2 months to prepare the documentation for the application (which is a complex process), and 4 months for the Environment Agency to assess the application. Assuming there are no issues which arise due to the application, the consent licence should then be issued. It should be noted that boats under 25m (or those which are certainly not painted with TBT based anti-fouling paint) could use the facility prior to consent.

Consultation

Discussions have been held with the Environment Agency (EA) regarding the Integrated Pollution Prevention Control (IPPC) Application. They have confirmed that the facility will need such consent should boats of over 25m, painted with TBT based anti-fouling paint, use the facility.

Existing Water Quality Conditions

Bathing water quality is divided into three classes; Excellent, Good and Poor. The results for the last nine years show that at Shoalstone the bathing water quality has been excellent bar one year. The 1999 figures are shown in Table 3.3.

Table 3.3 Bathing water Quality variables for 1999 at Shoalstone

DATE	Total Coliforms (Colonies/100ml)	Faecal Coliforms (Colonies/100ml)	Faecal Streptococci (Colonies/100ml)
5/5/99	<10	<10	<10
12/5/99	<10	<10	<10
17/5/99	333	189	135
21/5/99	<10	<10	<10
28/5/99	<10	<10	<10
7/6/99	<10	<10	90
16/6/99	36	27	36
23/6/99	<10	<10	<10
2/7/99	<10	<10	<10
9/7/99	<10	<10	<10
18/7/99	<10	<10	<10
27/7/99	189	120	90
3/8/99	36	<10	<10
12/8/99	18	<10	<10
19/8/99	<10	<10	18
28/8/99	54	18	<10
9/9/99	27<10	<10	<10
14/9/99	<10	<10	<10
18/9/99	18	18	<10
21/9/99	<10	<10	<10

Operational Discharges

The desk study revealed the following processes that could lead to discharges to the marine environment. It should be noted that it is planned that all water (and materials which get into the water e.g. paint fragments) generated from the facility will drain into tanks which will be removed from the site in accordance with the Waste and Special Waste Regulations);

- shot-blasting;
- painting;
- pressure washing;

- general maintenance ;
- accidental spills.

Shot-blasting

Shot-blasting results in shot fragments, paint fragments and iron oxides being emitted to the air. The shot itself consists of a variety of metal oxides, silicates and aluminates. The shot does not constitute a hazard to health and safety in its unused form, but both the dust fragments and the fragments of paint which result after use can be detrimental to health. This depends largely on what the process is being used to strip (i.e. paint types) and the environmental conditions (i.e. whether the blasting is taking place in the open or in an enclosed environment).

Painting

Painting of boats is likely to occur on a regular basis during routine maintenance. Paints are administered by brush / roller and by using paint spraying equipment. These processes could lead to direct transfer of paints to the water (via the air) and indirectly through spillage and washing down. At the end of the painting process, brushes and sprays are cleaned using thinners. Thinners contain a variety of volatile organic compounds (VOCs). It is possible that minor amounts of these compounds may find their way into the marine environment

Pressure washing

Pressure washing leads to water containing paint fragments being washed into the harbour. The paint fragments are mainly in solid (i.e. particulate form) although some compounds may be dissolved into the solution.

Accidental spills

It is possible that minor to moderate spills of oils, paints or other liquids used in the processes that will be carried out could occur.

Impact on Receptors

The sensitive receptors present at this site include:-

- The 'controlled' waters themselves
- Marine life within the water
- Bathers.

Discharges of any of the solutions outlined above under ‘operational discharges’ could have an impact on marine water quality – which is currently excellent in this area. This in turn could theoretically lead to impacts upon marine ecology and potentially bathers. In reality the risk of discharges causing a pollution incident are negligible as it is planned that all water / liquids which gather in the facility will be collected in tanks and removed from the site as special waste.

Construction Impacts

Construction impacts are likely to be very limited. In order to construct the dry-dock, 2 piles will be driven into the seabed. This will cause some disturbance to the sediments, which will cause a localised increase in suspended solid levels. However, this will be a very minor impact for a limited period of time and is unlikely to have any environmental implications.

Operational Impacts

The following operations will be undertaken on the proposed facility.

- shot-blasting;
- painting;
- pressure washing;
- general maintenance ;
- accidental spills.

A variety of materials and substances will be used during these activities and an amount of waste material will be generated, some of which could find its way (directly or indirectly) in to the marine environment if not properly controlled. This could lead to pollution of the sea-water and sea-bed sediments. However, such contamination should be mitigated in the design and operation of the facility in accordance with the IPPC guidelines and application. Should it be found that none of the boats using the facility are painted with TBT based anti-fouling paints then IPPC consent will not be required. In this case, the facility would only need consent from the Environment Agency if there were planned discharges into the sea.

The basic plan to control polluted water generated from the facility is to drain all waters into a tank. The water will then be tinkered off the site. It should be noted that this waste is likely to be classified as 'special waste' and as such its control will need to comply with the special waste regulations. This would include using a registered waste collector and ensuring that the waste was taken to a registered waste facility. IN addition all solid waste must be disposed of in accordance with the Waste Regulations. No discharges are planned from this facility.

Conclusions

The very nature of the facility and the processes being undertaken on board represent a potential risk to the marine environment. However, it is considered that with suitable measures in place in accordance with the IPPC Regulations (2000) the risk is low and thus the potential environmental impacts should be minimal.

3.4 Landscape / Visual Assessment

Introduction

The following appraisal summaries describe the nature of the visual effects of the proposed dry dock from selected viewpoints within the surrounding area. Before and after proposals are illustrated in the photomontage images on the attached **Figures 1-3**.

Three key viewpoints have been selected as being representative of those locations from which receptors views are particularly sensitive or are public areas where large numbers of visual receptors will experience the greatest change in view.

The selected key viewpoints are from:

- Battery Park
- The Yacht club

- The Town end of the breakwater

Photo viewpoint 1- The view from the edge of Battery Park.
The existing elevated view from Battery Park towards the site for the dry dock is across a foreground of open water, with the breakwater, open sea and the horizon beyond. Visitors to Battery Park currently would expect to see ships regularly moored in front of the existing jetty. The jetty is a permanent metal structure with a walkway connection to the breakwater.

Following construction of the new dry dock (**Figure 1-Photomontage**) the degree of change in the character and quality of view will be barely perceptible given both the scale and the relative size of the feature. When the dock is in operation, ships will be set inside the structure with masts the only feature visible above the dry dock structure in the vast majority of cases.

The colour of the new dry dock, which is buff, and the permeable views through the two ends of the structure assist in reducing the intrusion and bulk of the structure. At high tide the floating dry dock will be elevated slightly above the breakwater, although this change will be regular, it will be temporary in nature. Given the distance of the viewers from the proposed dock, the scale of the new structure, it's colour/form (i.e. not dissimilar to the existing jetty) and the movement of craft within the intervening harbour, the significance of visual effects has been judged to be minimal.

Photo viewpoint 2- The View from the front of the Yacht Club.
The elevated view from the Yacht Club towards the proposed location for the dry dock is across the open water of the harbour, with occasional boats moored in the foreground. The site is viewed against a backdrop of the existing breakwater with the sea and hills on the horizon. The existing jetty and moored ships are other prominent features located at the end of the breakwater.

The introduced dry dock is shown in the photomontage on **Figure 2**. The degree of change to the view will be insignificant as a consequence of distance and the limited extent of the proposed structure within the wider open view. The scale of the dry dock will be similar to that of the existing jetty (relatively small compared to those ships that use the jetty as a mooring).

A location for the dry dock alongside the existing jetty also avoids change to the character of the main stretch of the breakwater between the jetty and the town that is currently free of adjoining structures. The colour and form of the dry dock assists in further reducing visual effects. The effect of the new structure on the view of the yacht club members is therefore considered to be insignificant.

Photo viewpoint 3- The View from the Town end of the breakwater and harbour side promenade.

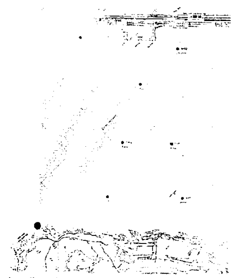
The existing view from this location has many prominent features in the foreground, the most significant being the marina. There are clear views from this location toward the harbour lighthouse and a clear length of the breakwater up to the existing jetty. The jetty can be seen set apart from, but linked via a walkway to, the end of the breakwater, with a ship moored alongside.

Photomontage **Figure 3** shows the introduced dry dock. From this angle of view only the two side walls of the dock are visible, when not in use. However, during operation, the boat under repair would occupy this space. The dry dock is smaller in elevation than the existing jetty and a small component of the wider view of the breakwater. A location alongside the existing jetty has been chosen in order to limit adverse effects upon marina and harbour side users and to avoid changing the character of the central section of the breakwater. The dry dock is shown set a similar distance away from the breakwater as the existing jetty and connected with a matching walkway. The new dry dock is located so that the view to the lighthouse is maintained and the arrangement of the existing jetty complimented.

Due to the scale of the dry dock, its location, colour, form and the proportion of the wider view effected, the significance of visual effects on receptors is considered minimal.

Conclusions

In visual terms the montages confirm that the potential effects of the dry dock upon visually sensitive receptors will be of a low or insignificant nature from all three viewpoints, despite the relatively prominent and open nature of the site. The proposed location, form and colour of the dock will enable it to be integrated into the harbour landscape in a way that is sensitive to its setting.



Location of Photo View Point

Before : Existing View

After : View with Dry Dock Superimposed

Photo Viewpoint 1

The View from Battery Park

JOB TITLE: Brixham Harbour	JOB NUMBER: KANSB
Drawing No. :KANSB/01	DRAWN BY: NEM
	CHECKED BY: AJC

Scott Wilson
Avalon House
Marcham Road
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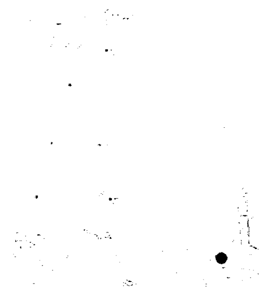
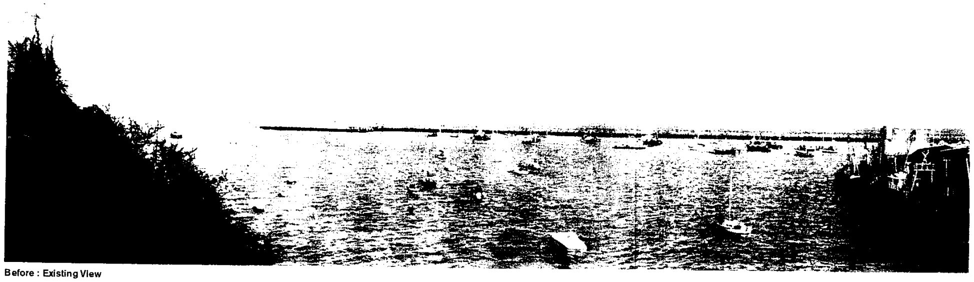
Oxon. OX14 1UG



Location of Photo View Point



Before : Existing View

After : View with Dry Dock Superimposed

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Photo Viewpoint 2

The View from the Yacht Club

JOB TITLE: Brixham Harbour	JOB NUMBER: KANSB
Drawing No. :KANSB/02	DRAWN BY: NEM
	CHECKED BY: AJC

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Avalon House
Marcham Road
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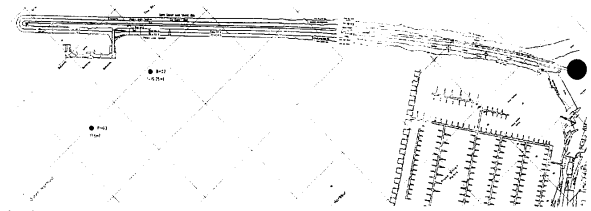

Location of Photo View Point

Before : Existing View

After : View with Dry Dock Superimposed

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Photo Viewpoint 3

The View from the Town end of the Breakwater

JOB TITLE: Brixham Harbour	JOB NUMBER: KANSB
Drawing No. :KANSB/03	DRAWN BY: NEM
	CHECKED BY: AJC

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