

11 COMMERCIAL AND RECREATIONAL NAVIGATION

11.1 EXISTING ENVIRONMENT

Introduction

- 11.1.1 This section considers the commercial and recreational navigation activity within Poole Harbour and Bay. Other recreational interests are detailed in Section 13.
- 11.1.2 In order to inform the EIA process and the design of the proposed channel, a navigation risk assessment was undertaken by Marine and Risk Consultants Ltd (MARICO).
- 11.1.3 As detailed in Section 3, the potential effects of the scheme on the hydrodynamics and sedimentary regime has been investigated by HR Wallingford. This information was used to determine the likely effects on navigation through changes in current flows and the patterns of accretion/erosion.
- 11.1.4 The implications of the proposed channel dredging on shipwash and drawdown has also been investigated by HR Wallingford (see Section 11.2).

Commercial activity

- 11.1.5 Poole is an important port for cross-channel ferries and bulk cargo. Brittany Ferries operate a regular cross-Channel service between Poole and Cherbourg; the *Barfleur* is a passenger and freight ferry and the *Coutances* is a freight ferry. The largest of the ferries is currently the *Barfleur* which is 20,000 tonnes, 157m long and 23m beam.
- 11.1.6 During the summer, Brittany Ferries typically make four sailings a day from Poole to Cherbourg (at 07:15, 12:30, 19:15 and 23:45) and during the winter three sailings a day are typically made (at 08:30, 16:00 and 23:45).
- 11.1.7 From April to October, Condor Ferries also operate a fast ferry service which connects Poole with the Channel Islands of Guernsey and Jersey, and from May to September this service runs to St. Malo. Condor Ferries also operate a seasonal service to Cherbourg in conjunction with Brittany Ferries.
- 11.1.8 The volume of Ro-Ro freight traffic from the port decreased from 76,849 vehicles in 2002/03 to 70,149 vehicles in 2003/2004 a reduction of 9%. Passengers for the year March 2003 to March 2004 travelling to France and the Channel Islands totalled 673,759, a decrease of 9% on the previous year. Vehicle numbers reduced from 228,377 to 212,324; losses were no worse than at other ports engaged in this business.
- 11.1.9 As a major destination for bulk cargo imports, the port receives imports of steel, timber, bricks, fertiliser, grain, aggregates and palletised traffic. Export cargoes include clay, sand fragmented steel and grain. Aggregate dredgers are also regular visitors to discharge their cargoes of sand and gravel. In 2003/2004, PHC cargo handling activities showed an increase in most sectors. The conventional cargo quays handled a total of 439,498 tonnes, compared to 436,256 in the preceding year; an increase of 9%. Steel volumes increased from 162,640 to 182,031 tonnes, with steel moved by PHC transport increasing by 20%. Timber imports reached 22,755 tonnes and, combined

with stone, fertilisers, grain and sand, these commodities form the bulk of other cargoes moving through the port.

- 11.1.10 Poole Harbour is also used by a number of other commercial craft, including sightseeing and fishing vessels. During the tourist season a number of sightseeing craft operate from Poole Quay to Sandbanks, Brownsea Island and around the Harbour. The Furzey Island supply vessel operates from the BP base at Hamworthy.
- 11.1.11 At the Harbour entrance, the chain ferry operates a regular, all-year car ferry service to connect Sandbanks with the Studland peninsula. This service is operated by the Bournemouth-Swanage Motor Road and Ferry Company.

Navigational procedures

- 11.1.12 Vessel movements within the Harbour are controlled by a Vessel Traffic Services (VTS) operated by PHC. The VTS station is manned on a 24 hour basis with a continuous watch on VHF channel 14. Vessels underway within the Harbour and approaches are required to maintain a continuous VHF radio listening watch on channel 14. All ships over 50 metres in length are subject to compulsory pilotage. Vessels over 25m in length are required to report to Harbour Control passing the Bar, North Haven, Aunt Betty Buoy and upon berthing.
- 11.1.13 Poole Harbour entrance is approached via the Swash Channel. The Swash Channel runs generally north-west/south-east and is identified on either side by port and starboard buoys. The Swash Channel currently has a declared depth of 6m below CD and is 150m wide.
- 11.1.14 Within the Harbour entrance, tidal flows can be significant with a tidal race in the vicinity of the chain ferry. A dog leg in the channel is created at this point, due to the presence of a small bank to the south of the channel at buoy No. 14 and Chapman's Peak (a shoal off Sandbanks) to the north.
- 11.1.15 The entrance can be very congested, especially in fine weather during the summer weekends; the tidal stream is fierce, especially on spring tides, and conditions can be exacerbated in situations where the wind is against the tide, which creates a steep chop. The passage of commercial ships adds to this challenge, which can be daunting for the small boat sailor.
- 11.1.16 There are on average, about 6 incidents a year involving small craft colliding with the chain ferry, usually because they have either lost control or misjudged their movements. None of these incidents has resulted in serious injury or worse in the last 7 years. One harbour patrol vessel is usually stationed in or near the Harbour entrance; other patrol craft can respond to any reported incident if within range. Safety measures are continually reviewed by PHC.
- 11.1.17 In 1996, a cross channel ferry came into contact with and parted one of the ferry chains. This resulted in an investigation and new procedures were put in place to minimise the chance of a re-occurrence. The chain ferry is now obliged to remain hard on the slip for the passage of a commercial vessel and formal control procedures are in place.

- 11.1.18 When past the Harbour entrance, large vessels are required to make a 80° turn to starboard to proceed northwards through Brownsea Roads towards the Middle Ship Channel. The channel widths in this area vary between 300m and 275m. Due to tidal streams, vessels normally maintain about 10 knots in order to maintain steerage way.
- 11.1.19 The Middle Ship Channel runs in a direction 293°/113° from Aunt Betty (50 buoy) to Diver (51 buoy). The channel is 80m wide. At the port, Middle Ship Channel opens out into the Turning Basin. The basin is approximately 250m wide and vessels normally turn to port when swinging.

Recreational navigation

- 11.1.20 Poole Harbour is very popular for recreational boating, both for motor boats and sailing vessels. Around eight yacht clubs and ten boat yards are present around the Harbour. The majority of resident yachts are based in one of the many marinas or on moorings. There are approximately 4,500 wet berths in the Harbour comprising approximately 2,500 swinging moorings and around 2,000 pontoon berths in marinas, havens and yacht clubs etc. In addition, around 13,300 visitor boat nights are spent in the Harbour each year. The majority of visiting craft stay at Town Quay and Boat Haven.
- 11.1.21 The Harbour is used both for regular sailing races and for regattas, including world and national championships and open meetings. The majority of these sailing events take place in the summer months. In order to minimise navigation conflict, small vessels are requested to avoid sailing in the main navigation channels where possible, especially in poor visibility
- 11.1.22 For the past 6 years, PHC have carried out an annual survey of recreational activity within the Harbour. During this survey a “line of sight” headcount is carried out at two locations in the harbour: the Harbour Entrance and Lake Pier. The survey is carried out on selected days throughout the summer season to provide a balance of weekdays and weekends. The survey is repeated in most years to give a comparison of levels of recreational activity within the Harbour. Data is also collated by the Assistant Harbour Master. The surveys have recorded that the level of recreational activity has, in general, stayed relatively constant since recording began in 1988. An exception to this is the number of visitor boat nights in Poole, which increased significantly after opening of the Poole Quay Boat Haven in 2001/2002.
- 11.1.23 A summary of the level of recreational activity in the Harbour is presented in Table 11.1 using the most recent data available in order to assess current usage and recent trends.

Table 11.1 Summary of figures for recreational activity within Poole Harbour for 2003 (from information provided by PHC)

Item	Number		Difference compared to 2002
Total number of visitor boat nights (where Harbour dues have been paid)	13319		+16.87%
Number of visitor boat nights at Town Quay	11711		+17.80%
Number of personal watercraft permits issued	Daily	813	+23.7%
	Weekly	34	-61.80%
	Fortnightly	3	-
	Annual	177	+27.34%
Mean daily number of vessels passing Harbour entrance	560		+6.67%
Mean daily number of vessels passing Lake Pier	223		+10.40%

11.1.24 A number of popular anchorages are also found in Poole Bay; Shell Bay and Studland are good anchorages, which are frequented by boats on day trips from Poole. Popular anchorages are also found in Swanage Bay.

11.2 POTENTIAL IMPACTS ASSOCIATED WITH THE APPROACH CHANNEL DEEPENING

Construction phase

Risk of collision during capital dredging

11.2.1 During the construction phase, a trailing suction hopper dredger would be present within the shipping channels. This represents a potential risk to navigation through collision between the dredger and another vessel.

11.2.2 The dredging would not be static while working; it would navigate slowly along a particular path whilst dredging. The size of dredger that would be used is likely to be similar to that used for maintenance dredging (approximately 1,500m³ hopper capacity). The dredger would be present for up to 7 months and during this period it would be operational 24 hours a day.

11.2.3 The greatest risk of collision would exist while the vessel was dredging because at such times the dredger would be restricted in its ability to manoeuvre. The vessel would, however, be travelling more slowly than at times of transit to beach nourishment sites or the offshore disposal ground.

11.2.4 In order to minimise the risk of collision between the dredger and other vessels, the dredger would display appropriate lights and day signals, indicating that it is restricted in its ability to manoeuvre. The vessel would be subject to standard operational requirements (to specified in the contract documents); specifically, the dredger would be under the control of the Port and required to give way to commercial vessels. As for previous dredging operations, Notices to Mariners would be issued to inform other vessels of the presence of the dredger.

- 11.2.5 During previous dredging operations carried out by PHC, no navigational conflict has been experienced and, in the case of the proposed channel dredging, the works are to be carried out over the winter period when the number of recreational vessels that pass within the vicinity of the navigation channels to be dredged is significantly lower than during the summer months.
- 11.2.6 In view of the above, and given that the Harbour is used by commercial shipping, it is predicted that the presence of the dredger would not result in a significant change to the existing risk of collision. As such, the potential impact associated with the presence of the dredger is considered to be of **negligible significance**.

Mitigation and residual impact

No mitigation measures are required beyond those measures described above (e.g. display of appropriate signals). A residual impact of **negligible significance** would arise with respect to the risk of collision during capital dredging.

Relocation of moorings due to capital dredging

- 11.2.7 In order to undertake capital dredging it would be necessary to temporarily relocate 9 or 10 deep-water moorings which are present at the edge of the Middle Ship Channel. Around 6 or 7 moorings may need to be permanently relocated. It is proposed that the moorings would be relocated to a nearby area which has similar characteristics. Given this proposed measure, there would be **no impact** given that there would not be a loss of moorings as a result of the capital dredging.

Mitigation and residual impact

No mitigation measures are required. There would be **no residual impact**.

Potential effect of the presence of the dredging on the operation of chain ferry

- 11.2.8 The presence of the dredger has the potential to interfere with the service of the chain ferry if, for example, the dredger was to make contact with the chains, the dredger collided with the ferry or if dredging meant that the service of the chain ferry was interrupted.
- 11.2.9 The closest location of the proposed dredging to the chain ferry is in the vicinity of Buoy No. 14, approximately 80m away from the chain ferry. This is a sufficient distance away from the ferry such that it would not be necessary to interrupt the operation of the ferry to carry out the dredging. The dredger would be under the control of the Port and standard navigational procedures would be followed, as described above. There is probably less risk of the dredger colliding with the ferry, or making contact with the chains, compared with other vessels which currently transit the Harbour entrance due to the highly controllable nature of the vessel at low speeds. Given that no dredging would take place in the area where the chain ferry operates, combined with the control measures described above, **no impact** is predicted on the operation of the chain ferry due to capital dredging.

Mitigation and residual impact

No mitigation measures are required. There would be **no residual impact**.

Operational phase

Implications of potential changes to shipwash for intertidal habitats and Harbour users

11.2.10 The assessment of the effects of shipwash and draw-down on intertidal areas considered the following:

- The potential shipwash energy generated by a new ferry in combination with the proposed channel configuration compared with the existing situation;
- The magnitude of the shipwash energy compared with natural wave energy in the Harbour; and,
- The effect of vessel draw-down (the creation of a drop in water level) as the vessel passes through the entrance (close to beaches). Comparisons have been made between the largest of the present ferries operating (*Barfleur*) and a non-specific new vessel.

11.2.11 The assessment made use of findings from the navigation studies carried out at HR Wallingford in combination with data previously obtained from wave studies of Poole Harbour.

Shipwash

11.2.12 Ships in motion generate transverse and diverging wave components. The interference between these two waves creates a cusp locus or wake. The height of the wake generated is dependent on the vessel's speed, shape and the depth of water through which it is moving. The wake height decays as it propagates away from the ship, so the wave height experienced at a given point is also dependent on its distance from the sailing line. The wave generated could potentially adversely affect the shoreline by enhancing the erosion caused by natural waves.

11.2.13 Outside the Harbour, the running of a proposed larger ferry would generate slightly larger waves around Sandbanks and Haven Point. Peak wave heights due to passing ferries in this area are likely to increase by about 14%. Even with this increase, the contribution to wave energy in the area from shipwash is considered to be small.

11.2.14 Inside the Harbour, the provision of a deeper channel, dredged to 8m below CD (in order to provide the declared depth of 7.5m below CD), would lead to waves 20-27% smaller than existing conditions. If the channel is allowed to infill above 8m below CD the reduction in wave height would be less. Wave heights would increase above existing conditions if the channel depth is less than about 6.6m below CD.

11.2.15 The contribution of ferry wake to the total wave energy is negligible in comparison to the natural wind-generated waves.

11.2.16 There is no reason to believe that waves generated by vessels in the new channel would cause any significant changes at the coastline.

Draw-down

11.2.17 As a ship moves through the water, water must be pushed out of its way at the bow and drawn in behind it at the stern. There is also a flow of water down each side, moving water from the front to rear of the ship. Associated with this flow of water around the ship, there is a pressure field which results in high pressure at the bow and stern and low pressure at the sides. The pressure field affects the water surface level, so that it is elevated where pressure is high (at the bow and stern) and depressed where pressure is low (at the sides). This pattern spreads to some extent into the area of water around the ship, and the depression of the water surface to the ship's sides is referred to as 'drawdown'.

11.2.18 Some occurrences of unexpected wave action associated with large vessel passage have been reported in the Harbour. These events may have been associated with shipwash or draw-down.

11.2.19 The magnitude of the draw-down is only weakly dependent on the water depth, and is, therefore, associated primarily with the volume of water that is pushed out of the way by the moving vessel. Thus, it is predicted that there would be no significant change in draw-down associated with the *Barfleur* operating in the deepened channel. However, a larger ferry would have an approximately 35% larger cross-section than the *Barfleur* and would thus increase draw-down by a similar magnitude.

11.2.20 The magnitude of draw-down for a larger vessel is predicted to be about 0.06m within 50m of the vessel reducing to 0.02m 200m away from the vessel. The magnitude of draw-down with the *Barfleur* is predicted to be 0.04m within 50m of the vessel. The maximum effect of draw-down would occur within the navigation channel.

Assessment of potential impacts

11.2.21 The main concern with respect to both shipwash and draw-down is the safety aspect for bathers and small boats, disturbance to feeding and roosting waterfowl and erosion of intertidal habitats. As described above, it is predicted that within Poole Harbour there would be a reduction in the magnitude of shipwash and, therefore, the proposed scheme would not give rise to additional effects on intertidal areas that arising from this phenomenon (such as, for example, disturbance to feeding and roosting birds and intertidal erosion). Although the scheme would result in a beneficial effect given the predicted reduction in magnitude of shipwash, the significance of the impact is considered to be of **negligible significance** given that shipwash would occur (as it does at present) at a similar frequency to the existing situation.

11.2.22 With respect to draw-down, there is the potential for an increased magnitude of draw-down in the Harbour with a larger vessel operating and this has the potential to affect other harbour users and feeding/roosting birds due to the disturbance that can arise through sudden unexpected changes to water level. Although the magnitude of draw-down is predicted to increase, the frequency occurrence would not be changed from the existing situation as a result of the proposed channel dredging.

11.2.23 Overall, the implications of increased draw-down for harbour users is expected to be of **negligible significance** given that the effect is greatest within the navigation channel and decreases with distance from the ship. Therefore, compared with the existing situation, minor changes are predicted.

11.2.24 Draw-down associated with the passage of the *Barfleur* would not be significantly changed as a result of the proposed channel deepening.

Mitigation and residual impact

With respect to shipwash, no mitigation is required. There are currently notices on groynes along the Sandbanks beach to warn bathers that passing ships can result in unexpected changes to water levels and no further mitigation measures are required.

In summary, it is concluded that effects on users of the Harbour associated with changes to shipwash and draw-down would be of small magnitude and of **negligible significance**.

Increase in safety of navigation for large vessels

11.2.25 The creation of a deeper and, in parts, wider channel would be beneficial for existing vessels that access the Harbour in that the risk of grounding would be reduced and thus the safety of navigation would be enhanced. It may also potentially increase the safety of navigation for larger vessels, which cannot access the port at present, by allowing them to use Poole as a safe haven in the event of bad weather. This impact is considered to be of **minor beneficial significance**.

Mitigation and residual impact

No mitigation measures are required. A residual impact of **minor beneficial significance** would arise.

Effects on collision risk due presence of larger vessels

11.2.26 Following completion of the works, vessels with a deeper draft would be able to access the Port. As discussed in Section 1.2, while it is predicted that the size of vessels using the Port would increase, the number of vessel visits would not because this is limited by the berthing facilities.

11.2.27 Following the proposed capital dredging, PHC would maintain the safety of navigation around the Harbour entrance by installing navigational aids. These could include one or more of the following measures:

- A lit beacon adjacent to the seaward ferry chain or near the limit of the channel;
- A lit transit to indicate Chapman's Peak;
- A lit transit to indicate the safe southern limit of the channel;
- A directional light beacon in the vicinity of Brownsea Buoy (and to replace Brownsea Buoy) to indicate the optimum approach track to the entrance;

- An additional directional light beacon in the vicinity of No 18 buoy (and to replace No 18 buoy) to indicate the optimum track through the harbour entrance.

11.2.28 Consequently, the introduction of larger vessels would not increase the collision risk to other vessels, particularly given that the proposed channel has been designed to accommodate larger vessels in a safe manner. Furthermore, when more detail is known about the dimensions of the new vessel, a separate navigational risk assessment would be carried out PHC to confirm the generic risk assessment. It is, therefore, considered that there would be **no impact** on navigation risk following the proposed dredging.

Mitigation and residual impact

No mitigation measures are required. **No residual impact** would arise.

Effects on operation of the chain ferry at the Harbour entrance

11.2.29 The operators of the Bournemouth – Swanage chain ferry have expressed concern that, following completion of the dredge, the presence of a deeper channel and vessels of deeper draft might interfere with the operation of the chain ferry.

11.2.30 However, the channel in the immediate vicinity of the chain ferry (i.e. up to 80m either side) would not be dredged and, therefore, would remain at its existing depth and profile. Consequently, the dredging would not affect the lie of the chains or the operation of the ferry. There would be some small changes to current speeds in the vicinity of the chain ferry which could have an influence on its behaviour.

11.2.31 At present, control procedures are in place that minimise the risk of contact between all commercial vessels, and vessels judged to present a collision risk, and the chains. The chain ferry is obliged to remain hard on the slip for the passage of a commercial vessel. As discussed above, following completion of the dredge, it is proposed to increase the safety of navigation in the channel by installing new navigational aids. Furthermore, when more precise detail is available about the dimensions of the potential new ships, separate navigational risk assessments would be carried out to confirm the generic risk assessment.

11.2.32 It is predicted that with the continued use of such control measures there would be no significant increase in the risk of contact between commercial vessels and the chains. Therefore, this impact is considered to be of **negligible significance**.

Mitigation and residual impact

No mitigation measures are required. A residual impact of **negligible significance** would arise.

Effects on navigation due to changes in current speeds and wave activity

- 11.2.33 Poole Yachting Association and others have expressed concern that the Harbour deepening could cause an increase in current speeds and wave activity which would have an adverse impact on small boat navigation.
- 11.2.34 At present, tides run strongly in certain areas of the Harbour which can make navigation difficult. This is particularly the case in the Harbour entrance, which makes navigation difficult for vessels under sail or with small engines, especially when the entrance is congested.
- 11.2.35 The predicted effect of the deepening on current speeds has been investigated by HR Wallingford (see Section 3.7). The maximum flows in the entrance channel would not be significantly increased; however, there would be changes to the flow regime (both speeds and direction in the vicinity of Buoy 14). A modest decrease in current speeds is predicted in the East Looe Channel.
- 11.2.36 It is predicted that the change in current flows are minimal, with the most significant changes being for vessels which may use the area around Buoy 14 where increases in peak current speeds of about 0.3m/s (0.6 knots) are predicted to occur; this would occur in a very localised area. Increases in flows in this area would not be of sufficient magnitude to affect commercial navigation but could affect recreational craft in this area. Small decreases in flow in the East Looe Channel are predicted to reduce scour problems to the east of the Haven Hotel and potentially cause the channel to become a slightly less erosional area.
- 11.2.37 It is predicted that the proposed channel deepening would have a small effect on wave heights. Within the Harbour, changes in wave height of the order of 1 to 2cm are predicted along the shoreline of Brownsea Island for short period waves. Very small changes are predicted elsewhere in the coastal areas, with wave heights predicted to marginally decrease in some areas and increase in others.
- 11.2.38 Overall, minimal changes are predicted and, therefore, a potential impact of **minor adverse significance** would arise for recreational craft.

Mitigation and residual impact

The effect of the proposed channel deepening of recreational craft is not possible to mitigate and the residual impact would be of **minor adverse significance**.

Effects on navigation due to change in tidal range

- 11.2.39 The presence of the deeper channel is predicted to change tidal propagation within the Harbour which has the potential to affect navigation through altering water levels. As described in Section 3.7, following the dredge the levels of high water would be little changed but low tide levels are predicted to be slightly lower. At spring tide, low water would be up to 20mm lower after the channel deepening. This is a permanent impact. However, it is considered that lowering the level of low water by 20mm would not affect navigation because the change is too small to be detectable by commercial and

recreational craft and the effect arises for a short period of time at low water on spring tides. This impact is, therefore, assessed as being of **negligible significance**.

Mitigation and residual impact

No mitigation measures are required. The residual impact would be of **negligible significance**.

Effects on navigation due to accretion of channels

- 11.2.40 The predicted changes in annual erosion and deposition are presented in Figure 3.7. As this figure shows, in certain areas of the Harbour there would be an annual increase in deposition of generally between 0.005 and 0.01m per year, whereas within other areas there would be a lower rate of deposition or increase in erosion (generally in the order of -0.01m/yr) depending on the existing trend in a particular area.
- 11.2.41 Concern has been expressed by the yachting community about the potential siltation of channels such as North Channel, which could hinder navigation in the area. Within the North Channel, there are localised areas of predicted increase in deposition of around 0.01m/yr. It is predicted that, in the short-term, this would have no impact on navigation as the levels of deposition are too low. However, over the much longer term this might have implications for navigation. For example, in 10 years the height of the seabed would have increased by 10cm and over 50 years the height of the seabed would have increased by 0.5m. It is anticipated that, assuming siltation continues at the predicted rate, it may result in an impact of **minor adverse significance**, commencing around 20 to 30 years after the proposed deepening.

Mitigation and residual impact

It is not possible to mitigate this potential impact, but it is possible that in the future maintenance dredging could be undertaken within affected channels in order to maintain depths. The material would be maintained in the system where possible. Should such measures be undertaken, there would be **no residual impact**, otherwise the residual impact would be of **minor adverse significance**.

11.3 POTENTIAL IMPACTS ASSOCIATED WITH THE OFFSHORE DISPOSAL OF DREDGED MATERIAL

Construction phase

Collision risk due to presence of the dredger

- 11.3.1 During the dredging works, the dredger would be making regular trips to the Swanage offshore disposal ground and the beach nourishment locations. These trips would be made on a regular cycle, 24 hours a day. If the disposal ground were in a confined sea area or situated in the middle of a shipping lane, the presence of the dredger disposing its cargo might present a collision hazard to other vessels. However, the Swanage disposal ground is situated in an area of open sea away from any busy shipping routes.

Furthermore, when disposing of its cargo, the dredger would not be anchored or restricted in its ability to manoeuvre. In addition, no navigational problems have been experienced in previous dredging campaigns. It is, therefore, predicted that the presence of the dredger would have an impact of **negligible significance** on navigation risk.

Mitigation and residual impact

No mitigation measures are required. The residual impact would be of **negligible significance**.

Operational phase

Obstruction to navigation through the accumulation of material

11.3.2 Disposal at sea can potentially represent a risk to navigation by decreasing water depths at the disposal ground.

11.3.3 The disposal of material at the Swanage offshore disposal ground has been modelled by HR Wallingford (see Section 3.6). About 700,000m³ of material is likely to be disposed at this site, comprising a mixture of fine silty material, sands and gravel. The silt and sand fractions would be winnowed from the site by currents, leaving a small amount of the coarser gravel behind. The volume of gravel to be placed at the site is very small and would arise from dredging in certain areas where there is a mixture of dredged material. The effect of this would be to result in an overall coarsening of the seabed at the disposal ground. However, there would be no significant effect on water depths and **no impact** is predicted on navigation in the area.

Mitigation and residual impact

No mitigation measures are required. There would be **no residual impact**.

11.4 POTENTIAL IMPACTS ASSOCIATED WITH BEACH NOURISHMENT

Construction phase

Navigational conflict due to presence of nourishment plant

11.4.1 During the beach nourishment works, a pipeline would need to be present to pump material ashore from the dredger to the beach. The presence of the pipeline and associated vessels potentially represents a hazard to navigation.

11.4.2 During previous beach nourishment operations, the shallowest that the dredger has been stationed has been at the -5m CD contour line. The dredger would typically be located about 0.5km from the shore. The pipeline would be present for most of the duration of the works, which is expected to be up to 7 months.

- 11.4.3 No navigational incidents have been experienced during previous dredging campaigns in the area and there is ample searoom within Poole Bay for vessels to navigate around the plant. It is, therefore, predicted that the beach nourishment works would have, at worst, an impact of **minor adverse significance** on navigation.

Mitigation and residual impact

The potential hazard will be minimised by issuing Notices to Mariners and putting appropriate lights and day signals on the pipeline and associated plant. No further mitigation measures are possible. The residual impact would be of **negligible significance**.

Operational phase

- 11.4.4 During the operational phase, it is recognised that there is the potential for using appropriate material that arises from the maintenance dredging of the approach channel in a beneficial manner for beach renourishment within Poole Bay. The potential environmental impacts of such renourishment would be dependant on the location where it is considered that nourishment is required, the volume of material that is to be placed on the beach and the nature of the material.
- 11.4.5 Given that there is no scheme for renourishment at present, this is outside the scope of this EIA which focuses on the potential impacts of the initial nourishment scheme. The potential environmental impacts associated with any renourishment scheme that may be required would need to be taken into account during the application for the Food and Environment Protection Act and Coast Protection Act consents that would be required.

