

## **32 SUMMARY OF POTENTIAL IMPACTS ASSOCIATED WITH THE DISPOSAL OF DREDGED MATERIAL AND MITIGATION**

1. Tables 32.1.1 and 32.1.2 summarise the predicted effects associated with the disposal of dredged material associated with the reconfiguration of Felixstowe South, for the disposal and post-disposal phases respectively. Details of proposed mitigation measures are set out and residual impacts given. The following sub-sections also provide a summary of the key effects expected to arise due to the proposals on the biological and physical resource, as well as the human environment.

### **32.1 ASSESSMENT OF HYDRODYNAMIC AND SEDIMENTARY IMPLICATIONS OF THE DISPOSAL OF DREDGED MATERIAL**

#### **32.1.1 Dispersion of capital dredged clay from Inner Gabbard (East)**

1. The results of the dispersion studies indicated that the release of fine sediment into the water column would cause increases in the depth-averaged suspended sediment concentration of up to up to 15mg/l on spring tides and 25mg/l on neap tides. This would not lead to permanent deposition, because the tidal currents existing in the area are sufficient to re-suspend any fine sediment settling on the bed. The exception to this may be in areas of local irregular bathymetry where deposition of sediment occurs at present. Temporary deposition of fine material at slack water arising from these operations is predicted to be a fraction of a millimetre.

#### **32.1.2 Dispersion of capital dredged sand from Inner Gabbard (East)**

1. In order to minimise the dispersion of sand, it was concluded that a series of placements should be made at the same location, creating localised mounds of clay/sand (and to a lesser extent rock) a few metres high.

2. The sediment dispersed from the disposal area would be in suspension, although primarily in the bottom few metres of the water column. This means that the material is likely to disperse widely and, on depositing at slack water, would form a thin layer of sand over a large area before being resuspended on the next tide. The depth of (temporary) accretion occurring at slack water would be a fraction of a millimetre and would not, therefore, cause smothering of the surrounding seabed.

#### **32.1.3 Disposal of capital muds at the Inner Gabbard dispersive disposal ground**

1. The disposal of silt at the Inner Gabbard disposal is currently undertaken by the HHA for the disposal of maintenance dredged silt arising from 4 or 5 campaigns annually. The annual disposal of silts currently amounts to roughly 2Mm<sup>3</sup> and no adverse impacts have been reported as a result of this practice.

2. In order for the 'capital' silts to behave in a dispersive manner when deposited at the Inner Gabbard, it is proposed to mechanically disaggregate the material. This method was adopted for the disposal of material associated with the Trinity III Terminal extension.

3. The disposal of an extra 140,000m<sup>3</sup> of silts arising from the capital dredging associated with the Felixstowe South Reconfiguration, over the period of one year, would not be expected to have an impact on the site. Should the review of the Trinity III monitoring data reveal another outcome, consideration would be given to the placement of the capital muds at the Inner Gabbard (East).

#### **32.1.4 Effect of capital placement upon tidal currents, wave propagation and bedload transport**

1. HR Wallingford investigated the placement of 40Mm<sup>3</sup> at the Inner Gabbard, with mounds up to 8m high and a footprint over an area 2.5km by 2km. Any impacts resulting from the proposed capital disposal associated with Felixstowe South (2.5Mm<sup>3</sup>), therefore, would be many times smaller than those arising in the scenario tested.

2. The studies found that the impact of the placement of 40Mm<sup>3</sup> on tidal currents would be negligible outside of the proposed capital placement area and that water depths at the Inner Gabbard (East) (at around 50m) are too great to have any effect on wave propagation.

3. The studies also concluded that the placement of clay would effectively block the net movement of any local bedload transport, but that there is little bedload sediment transport through the area of the Inner Gabbard. Therefore, any resulting local accretion would be minimal, as would any change to sand transport in the streamline of the placement. This conclusion also applies to the Inner Gabbard (East).

### **32.2 OVERVIEW OF POTENTIAL IMPACTS ON THE BIOLOGICAL AND PHYSICAL RESOURCE**

#### **32.2.1 Subtidal marine communities**

1. During the disposal of capital silts at the Inner Gabbard dispersive ground, a worst case impact of minor adverse significance is predicted. The deposition of material at the Inner Gabbard (East) disposal ground would result in an impact of moderate adverse significance due to smothering of the seabed with clay, rock, sand and gravel.

2. In addition, clay balls would migrate from the disposal area with the potential for an impact of negligible to minor adverse significance on the benthic resource. Sedimentation of fine material outside of the footprint of the clay deposition would be negligible.

3. During the post-disposal phase, the dredged material would become recolonised. Given that there would be a negligible effect on the hydrodynamic regime outside the immediate vicinity of the site, indirect effects on subtidal communities would be negligible.

4. The disposal of a mixture of stiff clay, rock, gravel and sand at the Inner Gabbard (East) site would, within the footprint of the disposal, create a habitat

with a greater diversity of sediment types than currently exists. The disposal is also likely to result in the availability of numerous crevices. It is considered that this increased habitat diversity has the potential to support a greater abundance of lobsters and crabs and that this would represent a potential impact of minor beneficial significance.

### **32.2.2 Water and sediment quality**

1. Minimal fine material is expected to be lost during the disposal of clay and, therefore, the water quality impact would be negligible. No impacts are expected on sediment quality.

## **32.3 OVERVIEW OF POTENTIAL IMPACTS ON THE HUMAN ENVIRONMENT**

### **32.3.1 Commercial navigation**

1. During disposal, an impact of minor adverse significance on commercial navigation could arise due to the presence of disposal barges. No impacts are anticipated during the operational phase.

### **32.3.2 Fisheries and fishing activity**

1. There would be a negligible impact on fishing activity due to the presence of disposal vessels. However, an impact of minor adverse significance could be expected due to the migration of clay balls from the disposal site.

2. Given the low usage of the area by fishermen, a negligible impact would arise due to the loss of potential fishing grounds. During the post-disposal phase, the potential exists for enhancement of the crustacean fishery at the site, due to the mixed nature of the material to be placed; this is considered to potentially be of minor beneficial significance.

### **32.3.3 Mineral resources**

1. No impact on licensed aggregate extraction sites would arise during the disposal or post-disposal phase of the works, due to their distance from the disposal site.

**Table 32.1.1 Summary of the potential impacts, mitigation measures and residual impacts associated with the disposal phase**

Potential impact	Significance		Residual impact
N/A	N/A	N/A	N/A
<b>SUBTIDAL MARINE COMMUNITIES</b>			
Smothering of benthic communities during the disposal of capital silt	Minor adverse	Attempt to target disposal in areas where previous disposal has taken place	Minor adverse
Smothering of benthic communities during disposal of clay	Moderate adverse (overall, although locally, i.e. within the footprint of the disposal, the impact would be of greater significance)	Attempt to minimise footprint through targeting disposal and constructing containment bunds	Moderate adverse
Migration of clay balls outside of the disposal area	Minor to Moderate adverse	The construction of containment bunds would minimise the migration of clay balls	Negligible to Minor adverse
Sedimentation of material outside of the footprint of the clay deposition area	Negligible	None required	Negligible
<b>WATER AND SEDIMENT QUALITY</b>			
Increased turbidity due to the disposal of clay	Negligible	None required	Negligible
Potential elevation in sediment contaminants	No impact	None required	No impact
<b>COMMERCIAL NAVIGATION</b>			
Movements of disposal barges interfering with commercial navigation	Minor adverse	Other than following required navigation operating procedures, no mitigation measures are possible	Minor adverse
<b>FISHERIES RESOURCE AND COMMERCIAL FISHING ACTIVITY</b>			
Interference with fishing activity due to the disposal of dredged material	Negligible	Notice to Mariners to be issued	Negligible

**Table 31.1.2 Summary of the potential impacts, mitigation measures and residual impacts associated with the post-disposal phase**

Potential impact	Significance		Residual impact
<b>ND SEDIMENTARY REGIME</b>			
Effect of capital placement upon tidal currents	Negligible	None required	Negligible
Effect of capital placement upon wave propagation	No impact	None required	Negligible
Effect of capital placement on bedload sediment transport	Negligible	None required	Negligible
Effect of capital placement upon plumes resulting from placement of maintenance material	Negligible	None required	Negligible
<b>SUBTIDAL MARINE COMMUNITIES</b>			
Adaptation of benthic community following the disposal of clay	Although a beneficial impact post-disposal, it is not appropriate to assess this impact given that the overall project does not provide a benefit	N/A	N/A
Potential effect on benthic communities due to changes in flow regime and sedimentary patterns	Negligible	None required	Negligible
<b>WATER AND SEDIMENT QUALITY</b>			
No impacts	N/A	N/A	N/A
<b>COMMERCIAL NAVIGATION</b>			
Potential interference with navigation due to presence of material on the seabed	No impact	None required	No impact
<b>FISHERIES RESOURCE AND COMMERCIAL FISHING ACTIVITY</b>			
Reduction in potential fishing grounds	Negligible	None required	Negligible

**Table 31.1.2 (continued)**

Potential impact	Significance	Mitigation	Residual impact
<b>MINERAL RESOURCES</b>			
Potential impact on mineral resources due to movement of clay	No impact	None required	No impact