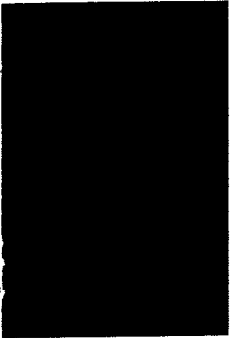

Fisheries Impact



7. FISHERIES IMPACT

7.1 INTRODUCTION

7.1.1 This section describes the outcome of the fisheries impact assessment. Since water quality modelling has indicated the localised extent of the impacts associated with dredging and reclamation works, a full fisheries impact assessment, as defined under the Technical Memorandum was not considered to be necessary. Existing information was therefore used as the basis of the assessment.

7.2 LEGISLATION AND ASSESSMENT CRITERIA

7.2.1 Annexes 8 and 9 of the EIAO TM set out general criteria for evaluating the impacts on fisheries as follows:

- Not to cause significant impact to sensitive areas for fisheries, particularly the nursery and spawning grounds of commercial species of fish, crustaceans, molluscs and other marine organisms;
- Not to cause significant loss or interference with use of fishing grounds or fish culture zones;
- Not to cause significant detrimental impact to local fishery resources and fishing activities; such impacts will be determined through comparison to fisheries production in the area.

7.3 BASELINE CONDITIONS

7.3.1 Due to the small scale nature of the works and the distance of the project site from mariculture sites a detailed fisheries survey was not undertaken for the specific purposes of this EIA. Information on capture fisheries was extracted from the Port Survey database 1996/1997 (AFD 1998).

7.3.2 Rabbit Fish (*Siganus oramin*), Croaker (*Argyrosomus* spp), pony fish (*Leiognathus brevirostris*) and flathead (*Platycephalus indicus*) and a mixture of crab species are commonly fished from the waters around Hebe Haven (Port Survey, 1996/7).

7.3.3 Pak Sha Wan is a busy home port for local fishing vessels. Port Shelter as a whole is more important for fish fry than for adult fish and ranks second in Hong Kong waters.

7.3.4 The Hebe Haven area is generally fished by small vessels under 15m in length and is ranked, in terms of value of fish and fry as 71st out of 189 in Hong Kong. Approximate equal importance is allocated for fish fry (ranked 64) and for adult fish (ranked 88).

7.3.5 At the southern end of the Pak Sha Wan peninsula is the Ma Nam Wat Fish Culture Zone. Water quality in the vicinity of the Fish Culture Zone is, based on EPD routine monitoring data, better than further inside Hebe Haven due to increased circulation. Suspended solids concentrations measured at station PM6 by EPD indicate depth averaged concentrations from 1993-1997 as low as 3.34mg/l compared to 11.8mg/l at PM5 which lies further inside the Haven close to the works area.

7.4 IMPACT ASSESSMENT

Key Issues

7.4.1 Impacts to fish from the release of nutrients, contaminants and suspended solids were identified as the key issues associated with this project. Physical impacts such as smothering effects of the sediment and loss of habitat due to the works were also considered to be potential issues of concern.

7.4.2 At the southern end of the Pak Sha Wan peninsula is the Ma Nam Wat Fish Culture Zone - impacts to water quality in this area were given a greater weighting given that captive fisheries were more at risk from the works as fish would be unable to move away from plumes.

Assessment Methodology

7.4.3 The results of the water quality modelling have formed the basis of the assessment of impacts to captive and capture fisheries in the area. The water quality objectives for Port Shelter were used to derive the assessment criteria for evaluating the significance of impacts to fisheries. Inside Hebe Haven an allowable increase of 3.5mg/l was used and further out, near the fish culture zone, an allowable increase of 1mg/l was used.

7.4.4 The mixing zone for the works (i.e. the area in which the water quality assessment criteria are exceeded) has therefore been reviewed to determine the extent of the waters used for capture fisheries affected and plume dispersion results have been reviewed to investigate whether any of the mariculture zones in Port Shelter could be affected by the works.

Impact Evaluation

7.4.5 A key feature of the modelling was that overnight, when works stop, all sediment settles within the vicinity of the works thus reducing the possibility of any cumulative effects on water quality throughout the dredging period. Due to rapid deposition, elevated levels of suspended solids will therefore be evident only during periods of active dredging. The model results indicate that the suspended solids levels will only exceed the water quality assessment criteria for suspended solids in waters within approximately 100m of the dredging operations.

7.4.6 It is likely that works disturbance will cause many of the mobile species to move from the affected area and impacts to fish and hence fisheries due to suspended solids will be minimal. Based on model results, Fish culture zones in the area will

be unaffected by the sediment plume as described in section 5. As such the impact to local fishermen is considered to be negligible but it is recommended that water quality monitoring works be undertaken to ensure that the works do not affect water quality at the FCZ.

- 7.4.7 The dredging works will cause only short term impacts whilst the dredger is operating - which will be up to 12 hours in any one day. These impacts are extremely localised to the works area and assuming the full 23,000m³ are dredged by a medium sized grab, works are likely to have been completed within 3-5 weeks of the commencement of dredging activities.
- 7.4.8 Nutrient releases were assessed in terms of nitrates (Section 5) and these were found to cause exceedances of the water quality assessment criteria, which were based on the WQOs, only within a few tens of metres of the dredging works. Generally releases were predicted to be undetectable and highly unlikely to affect the nutrient balance in the waters or to affect fisheries. TBT releases during the works are negligible and below the safe level for marine organisms.
- 7.4.9 Impacts of the biochemical oxygen demand of the sediment on the dissolved oxygen levels in the water were also considered in Section 5. The expected levels of sediment generated in the water column over a tidal cycle would not reduce DO to levels which cause an exceedance of the WQOs therefore it can be deduced that there would be no associated impacts to fish or fisheries
- 7.4.10 Sedimentation will occur in the immediate vicinity of the works area due to the very slow current speeds in the area. Fishing activities in the immediate vicinity of the works area are and will be minimal and therefore there are not anticipated to be any impacts to the fishing industry as a result of sedimentation or direct habitat loss.
- 7.4.11 The area of the proposed reclamation, which will cause irreversible loss of seabed and fishing area, is very small (<0.5ha) and it is considered that this represents an insignificant proportion of the total fisheries area in Hong Kong. No natural coastal areas will be affected by the reclamation and the seawalls will, to an extent, replace habitats lost to the reclamation.
- 7.4.12 Since Pak Sha Wan is used by relatively small fishing vessels, it is considered unlikely that the works will disrupt fishing vessel movement thus minimising impacts to commercial fishing vessels.

7.5 MITIGATION AND MONITORING

Significant impacts are not anticipated as a result of the works and hence no specific mitigation measures are recommended. However, good work practices are recommended to ensure impact avoidance to water quality, marine ecology and fisheries. Also, water quality monitoring at the works area and the fish culture zone is recommended during dredging to monitor the spread of the dredging plume and ensure the model output is correct.