

## 10. SUMMARY AND CONCLUSIONS

### 10.1 Introduction

This document has provided a detailed assessment of the potential environmental impacts associated with the construction and operation of the Tai O sheltered boat anchorage project. The following sections provide a summary of the key issues and impacts identified, and the requirement for mitigation.

### 10.2 Sheltered Boat Anchorage Design and Construction Methodology

Based upon the review of the CED sheltered boat anchorage design, the following conclusions can be made:

- the total volume of material which will be dredged in order to create the Tai O sheltered boat anchorage will be approximately 2.05Mm<sup>3</sup>, the vast majority of which is likely to comprise marine mud;
- the dredging should be undertaken using a maximum of two grab dredgers. These would load material into barges for off-site disposal;
- almost all of the dredged material (*in situ* volume) is expected to be taken by barge off-site for disposal;
- the proposed mangrove habitat area in the salt pans can be formed by using either mechanical or hydraulic placement methods - mechanical methods appear to be the most attractive option in terms of both economics and practicality;
- approximately 20,000m<sup>3</sup> of dredged material is anticipated to be placed in the salt pans in order to create the recommended mangrove habitat profile;
- approximately 30,000m<sup>3</sup> of fill material will be required to form the two proposed reclamation areas at the northern end of the salt pans - the fill material will be transported to site in barges;
- other materials such as sand, rockfill and armour stone for the breakwater and material for the construction of the berthing facility will also be transported to site using barges.

The sections below summarise the potential environmental impacts that may occur during the construction and operation of the Tai O sheltered boat anchorage as described above.

### 10.3 Noise Issues

Construction of the proposed Tai O sheltered boat anchorage is anticipated to last for about 3 years from 2001 to 2003 with construction activities being phased. Noise generating activities will occur throughout the construction phase. The main receptor areas that are liable to be affected by construction noise are the existing village areas such as Lung Tin Estate Phase 2 Area B, Buddhist Fat Ho Memorial College, Nam Chung Tsuen and some village houses.

Unmitigated construction activities are likely to exceed acceptable standards for construction noise limits. Where adverse noise impacts have been predicted, practicable mitigation measures have been proposed including the use of quiet plant and moveable barriers, whilst in order to protect a school defined as NSR 9 certain plant should not be used during examination periods. Following implementation of these mitigation measures, residual noise impacts would meet the EIAO-TM daytime criteria.

#### 10.4 Sediment Issues

The vast majority of the 2Mm<sup>3</sup> of material that may be dredged to facilitate the development of the Tai O sheltered boat anchorage are of Class A and thus suitable for open marine disposal. FMC have indicated that such material may be directed to the North of Lantau MBA, South of Tsing Yi MBA, South of Cheung Chau MBA or other available exhausted marine borrow pits, although the final decision will be made by FMC closer to the time of dredging. Surface sediment samples (0 - 0.1 m) taken from two locations contained lead and copper concentrations slightly in excess of the defined Class C criteria. The volume of contaminated sediments to be dredged is estimated to be 24,500m<sup>3</sup> (1.2% of total dredged sediment volume) (assumes dredging to a depth of 0.9m below seabed level and an allowance of 0.3m for over-dredging). This small volume of contaminated surface sediments should be disposed of to East Sha Chau Pit IV.

The physico-chemical characteristics of the sediment to be dredged from the Tai O sheltered boat anchorage site have been compared to sediments at existing mangroves in Hong Kong and China. This comparison illustrates that the Tai O sediments are wholly suitable for the creation of a mangrove habitat, in terms of its physical and chemical characteristics.

#### 10.5 Water Quality Issues

During the sheltered boat anchorage construction phase the greatest potential water quality impacts are likely to arise during dredging activities. The water quality modelling exercise undertaken illustrates that dredging will locally increase water suspended solids levels, especially in the inner parts of Tai O Bay. However, the observed suspended solids elevations are not predicted to significantly impact upon sensitive receivers within the bay or in the upper reaches of Tai O Creek. Whilst dredging has the ability to generate sediment plumes, the modelling results indicate that mean suspended solids concentrations outside the bay are below the WQO suspended solids criteria of 4.6mg/L. Whilst the dredging activities are not anticipated to significantly impact upon any identified sensitive receivers, appropriate dredging techniques have been specified together with applicable mitigation and working methods. Water quality impacts resulting from reclamation activities can be controlled through the implementation of mitigation measures as specified in ProPECC PN 1/94, whilst during the salt pan reworking phase measures such as the following should be implemented: works should only occur during low tidal conditions; material to be placed in the salt pans should be dredged using grab dredgers in order to minimise the sediment moisture content; a low rate of sediment reworking should be practised in order to minimise sediment disturbance (e.g. placement of approximately 100m<sup>3</sup> of dredged material in the salt pans per day and reworking of approximately 230m<sup>3</sup> of material a day); placed mud should be mixed with the coarser salt pan bed material to reduce erosion potential; there should be no material stockpiling in the salt pan area; the outer seawall should be breached prior to the onset of the works in order to reduce the velocity of water entering and leaving the salt pans and thus reduce the risk of erosion of newly placed or moved materials.

During sheltered boat anchorage operation, the main water quality concern relates to the accumulation of pollutants within the anchorage area - especially sewage effluents released from vessels. The water quality modelling exercise undertaken illustrates that during anchorage operation the main pollution sources are Tai O village and Nam Chung Tsuen, although vessel discharges make important contributions with respect to anchorage BOD, ammonia and faecal coliform levels. Whilst this is the case, based on the modelling results, it is anticipated that water quality in the anchorage will comply with defined WQOs. Although there may be local elevations of *E.coli* in the northern and southern parts of the anchorage during low and ebb tidal conditions. It is noted that no WQOs apply for *E.Coli* in this area and such elevations are currently known to occur. Water quality impacts during anchorage operation are not anticipated to significantly impact upon any identified sensitive receiver outside or within Tai O Bay or Tai O Creek, including the secondary contact recreation subzones along both sides of outer Tai O Bay and the mangrove habitat to be created in the salt pan area. It is noted that the mangrove stands in the upper parts of Tai O Creek are routinely exposed to higher pollutant loads than predicted to occur within the salt pan area. Nevertheless, methods to control the discharge of sewage effluents, boat bilge and litter into the anchorage have been proposed. Many of the mitigation measures proposed rely on the education and co-operation of anchorage users, as well as the strict enforcement of relevant water pollution control legislation.

## 10.6 Terrestrial and Marine Ecology Issues

The proposed works have the potential to affect the ecology of Tai O in two areas, namely; the offshore area designated for the anchorage and the intertidal salt pans allocated for future mangrove planting. A key aim of the anchorage design has been to minimise dredging requirements such that any adverse marine ecology impacts are minimised. Nevertheless, approximately 23.5ha of soft seabed would be temporarily disrupted by deepening of the anchorage area and access channels. No species of conservation interest would be significantly impacted and the residual impact associated with the loss of the 1.3ha strip of soft seabed for the breakwater is insignificant. In short, the residual ecological impacts of these activities are largely temporary and predicted to be minor if the specified mitigation measures are implemented. The salt pan filling will inevitably impact upon the existing habitat, (in this case, 12ha of disused salt pan including the 1ha lost to the northern reclamation). Given the low ecological value of this habitat and the measures that will be taken to retain its scattered mangrove plants, the residual ecological impact is considered to be insignificant and acceptable. Whilst not a direct benefit of this project, the future creation of the mangrove planting area will result in an overall conservation benefit to the Tai O area as a whole.

During anchorage operation, ecological impacts may be caused by water pollution arising from boat activities as well as wastewater discharges from the reclamation area. Measures to control water quality in Tai O Bay, including the discharge of vessel sewage and bilge have been proposed. Fully implemented, these measures should ensure that the potential impact upon the existing ecology as well as the future mangrove replanting project would be minor.

## 10.7 Fisheries Issues

Surveys and interviews with local fishers indicate that the site of the proposed sheltered boat anchorage is not of key importance to fishers based in Tai O. Impacts to fisheries from anchorage construction and operation and mangrove area preparation are predicted to be minor and can be fully mitigated. Fisheries monitoring during construction and operation is not

considered to be necessary.

Completion of the project is predicted to have beneficial impacts to the Tai O fishery. Taking into consideration the benefits associated with provision of a local boat anchorage and creation of a large mangrove area, the project is predicted to have a net positive impact upon Tai O fisheries.

## 10.8 Cultural Heritage Issues

The earliest recorded use of the identified salt fields at Tai O are from 1898 at Salt Field No 1. Salt Field No 2 comprises the site of the proposed mangrove planting habitat - the area was reclaimed from the sea after 1903 and only functioned as a salt field for about fifty years. It was undamaged until 1969 - 1970 when its sluice system and the salt-godown which served the area, were destroyed by the building of the Tai O Road. Shortly afterwards, the area was bulldozed out to form a series of seven large fish-traps. There are no buildings of historical interest on or adjacent to the site or Monuments, "Declared" or "Deemed". The area is thus considered to have limited potential for any archaeological relics.

The only significant feature of historical interest surviving today in this area is the 1903 - 1904 outer seawall of the salt field. Although very seriously damaged, the southern part in front of Fan Kwai Tong Village survives in quite good condition, and should be preserved in its present condition. Of the outer seawall the most important area which should, if possible, not be disturbed, is that strip where the two Fung Shui lines intersect (the San Tsuen Tin Hau Temple main Fung Shui line and the Fung Shui line which runs along the outer seawall). It is noted that breaches to the outer seawall to facilitate tidal flushing in the proposed mangrove habitat should be kept to a minimum and should only be considered in areas of the seawall that are already badly degraded and broken.

Assuming any redevelopment is sympathetic to the main Fung Shui line of the San Tsuen Tin Hau Temple, then there would be no Fung Shui impediment to re-development of the site of Salt Field No 2. The San Tsuen Tin Hau Temple Fung Shui line requires there to be no substantial buildings in the whole area in front of the temple, including the whole of the Salt Field No 2 site.

Analysis of the vibrocore samples indicates that there is no evidence of any significant marine archaeology within Tai O Bay. The results obtained from the marine archaeological survey undertaken as part of this Assignment were inconclusive – as such in order to ensure that any marine archaeological material is protected during the dredging works, the inclusion of a watching brief should be considered. However, it is noted that AMO plan to undertake an additional geophysical marine archaeology survey during the detailed design stage, after which the requirement for a watching brief during the dredging works will be re-evaluated.

## 10.9 Waste Collection During Sheltered Boat Anchorage Operation

In order to establish the need for a new Refuse Collection Point (RCP) at Tai O, existing and likely future waste generation patterns have been investigated. Development of the sheltered boat anchorage will affect waste arisings in two ways. Firstly, floating refuse is anticipated to accumulate within the anchorage area, and secondly, anchorage users are likely to generate wastes that need to be disposed responsibly. The volume of waste arisings from anchorage users is predicted to be low and recommendations have been made with respect to anchorage user

education to reduce fly tipping overboard. It is not possible to control floating refuse whose source is outside the outside of the anchorage, as such it is proposed that a litter collection service will be implemented during anchorage operation through a co-ordinated effort of the Regional Council and the Marine Department. This will be facilitated through the provision of a suitable berthing area at the western reclamation to enable marine-collected refuse to be delivered ashore. The impacts associated with the sheltered boat anchorage alone are not considered significant enough to warrant construction of a new RCP at Tai O. However, it is considered that the need for a new RCP to cater for the overall increase in wastes generated at Tai O resulting from both the revitalisation proposals (as being investigated by Planning Department) and the sheltered boat anchorage, should be considered in the revitalisation study.

## 10.10 Summary

This EIA Report has highlighted the potential impacts resulting from the construction and operation of the proposed Tai O sheltered boat anchorage. It is considered that whilst there will be adverse impacts during development construction and operation, such impacts are not considered to be severe or insurmountable and that through the adoption of the specified mitigation measures detailed herein, any anticipated impacts should be within acceptable limits.

In accordance with the EIAO TM and the Study Brief, this EIA Report includes a schedule of recommended mitigation measures as well as an impacts summary. An impacts summary is provided in **Table 10.1**, whilst **Table 10.2** provides a schedule of recommended mitigation measures.

**Table 10.1: Impacts Summary - Tai O Sheltered Boat Anchorage EIA.**

Impact	Construction Phase	Operation Phase
Noise	<p>Noise generating activities will occur throughout the construction phase. The main receptor areas that are liable to be affected by short-term construction noise are the existing village areas such as Lung Tin Estate Phase 2 Area B, Buddhist Fat Ho Memorial College, Nam Chung Tsuen and some village houses.</p> <p>Unmitigated construction activities are likely to exceed acceptable standards for construction noise limits, albeit over the short-term. Where adverse noise impacts have been predicted, practicable mitigation measures have been proposed. The residual noise impacts following the incorporation of the proposed noise mitigation measures would meet the EIAO-TM daytime criteria. Alternative methods for noise reduction and control will need to be incorporated into the design and construction contract clauses as necessary.</p>	<p>As detailed in the Project Profile prepared for the EIA Study, operation of the Tai O sheltered boat anchorage and reclamation areas is not anticipated to have significant noise impacts and thus mitigation measures were not considered to be required.</p>
Water Quality	<p>During the anchorage construction phase the greatest potential for short-term water quality impacts are likely to arise during dredging activities. The water quality modelling exercise undertaken illustrates that dredging will locally increase water suspended solids levels, especially in the inner parts of Tai O Bay. However, the observed suspended solids elevations are not predicted to significantly impact upon sensitive receivers within the bay or in the upper reaches of Tai O Creek. Whilst dredging has the ability to generate sediment plumes, the modelling results indicate that mean suspended solids concentrations outside the bay are below the WQO suspended solids criteria of 4.6mg/L. Whilst the dredging activities are not anticipated to significantly impact upon any identified sensitive receivers, appropriate dredging techniques have been specified together with applicable mitigation and working methods. Other water quality impacts resulting from reclamation and salt pan reworking, while of concern, can be controlled through the adoption of appropriate working methods and construction programming.</p>	<p>During anchorage operation, the main long-term water quality concern relates to the accumulation of pollutants within the anchorage area - especially sewage effluents released from vessels. The water quality modelling exercise undertaken illustrates that during anchorage operation the main pollution sources are Tai O village and Nam Chung Tsuen, although vessel discharges make important contributions with respect to anchorage BOD, ammonia and faecal coliform levels. Whilst this is the case, based on the modelling results, it is anticipated that water quality in the anchorage will comply with defined WQOs, although there may be local <i>E.coli</i> elevations in the northern and southern parts of the anchorage during low and ebb tidal conditions. It is noted that such <i>E.coli</i> elevations are currently known to occur. Long-term water quality impacts during anchorage operation are not anticipated to significantly impact upon any identified sensitive receiver outside or within Tai O Bay/Tai O Creek, including the secondary contact recreation subzone and the mangrove habitat to be created in the salt pan area. It is noted that the mangrove stands in the upper parts of Tai O Creek are routinely exposed to higher pollutant loads than predicted to occur within the salt pan area. Nevertheless, methods to control the discharge of sewage effluents, boat bilge and litter into the anchorage have been proposed. Many of the mitigation measures proposed rely on the education and co-operation of anchorage users, as well as the strict enforcement of relevant water pollution control legislation.</p>

Impact	Construction Phase	Operation Phase
Ecology	<p>The proposed works have the potential to affect the ecology of Tai O in two areas, namely; the offshore area designated for the anchorage and the intertidal salt pans allocated for future mangrove planting. A key aim of the anchorage design has been to minimise dredging requirements such that any adverse marine ecology impacts are minimised. Nevertheless, approximately 23.5ha of soft seabed would be temporarily disrupted by deepening of the anchorage area and access channels. No species of conservation interest would be significantly impacted and the residual impact associated with the loss of the 1.3ha strip of soft seabed for the breakwater is insignificant. In short, the residual ecological impacts of these activities are largely temporary and predicted to be minor if the specified mitigation measures are implemented. The salt pan filling will inevitably impact upon the existing habitat, (in this case, 12ha of disused salt pan including the 1ha lost to the northern reclamation). Given the low ecological value of this habitat and the measures that will be taken to retain its scattered mangrove plants, the residual ecological impact is considered to be insignificant and acceptable. Whilst not a direct benefit of this project, the future creation of the mangrove planting area will result in an overall conservation benefit to the Tai O area as a whole.</p>	<p>During anchorage operation, ecological impacts may be caused by water pollution arising from boat activities as well as wastewater discharges from the reclamation area. Measures to control water quality in Tai O Bay, including the discharge of vessel sewage and bilge have been proposed. Fully implemented, these measures should ensure that the potential impact upon the existing ecology as well as the future mangrove replanting project would be minor.</p>
Fisheries	<p>Surveys and interviews with local fishers indicate that the site of the proposed sheltered boat anchorage is not of key importance to fishers based in Tai O. Impacts to fisheries from anchorage construction are predicted to be minor and can be fully mitigated.</p>	<p>Taking into consideration the benefits associated with provision of a local boat anchorage and creation of a large mangrove area and the breakwater, the project is predicted to have a long-term net positive impact upon Tai O fisheries.</p>
Cultural Heritage	<p>The only significant feature of historical interest surviving today in this area is the 1903 - 1904 outer seawall of the salt field. Although very seriously damaged, the southern part in front of Fan Kwai Tong Village survives in quite good condition, and should be preserved in its present condition. Of the outer seawall the most important area which should, if possible, not be disturbed, is that strip where the two Fung Shui lines intersect (the San Tsuen Tin Hau Temple main Fung Shui line and the Fung Shui line which runs along the outer seawall). It is noted that breaches to the outer seawall to facilitate tidal flushing in the proposed mangrove habitat should be kept to a minimum and should only be considered in areas of the seawall that are already badly degraded and broken.</p>	<p>Operation of the sheltered boat anchorage is not anticipated to have any impact upon cultural heritage, although the existing outer seawall will require protection works to prevent damage caused by boat-generated wake.</p>

Impact	Construction Phase	Operation Phase
Cultural Heritage (cont.)	<p>Assuming any redevelopment is sympathetic to the main Fung Shui line of the San Tsuen Tin Hau Temple, then there would be no Fung Shui impediment to re-development of the site of Salt Field No 2. The San Tsuen Tin Hau Temple Fung Shui line requires there to be no substantial buildings in the whole area in front of the temple, including the whole of the Salt Field No 2 site.</p> <p>Analysis of the vibrocore samples indicates that there is no evidence of any significant marine archaeology with in Tai O Bay. The results obtained from the marine archaeological survey undertaken as part of this Assignment were inconclusive – as such in order to ensure that any marine archaeological material is protected during the dredging works, the inclusion of a watching brief should be considered. However, it is noted that AMO plan to undertake an additional geophysical marine archaeology survey during the detailed design stage, after which the requirement for a watching brief during the dredging works will be re-evaluated.</p>	

**Table 10.2: Implementation Schedule of Recommended Mitigation Measures - Tai O Sheltered Boat Anchorage (Agreement No. CE/41/98).**

EIA FAR Ref.	Environmental Protection Measures	Location/Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages		
						D	C	O
<b>NOISE MITIGATION MEASURES</b>								
3.8.5	Good Site Practice as follows*: <ul style="list-style-type: none"> <li>• use of well-maintained and regularly-serviced plant during the works</li> <li>• plant operating on an intermittent basis should be turned off or throttled down when not in active use</li> <li>• plant that is known to emit noise strongly in one direction should be orientated to face away from the NSRs</li> <li>• silencers, mufflers and enclosures for plant should be used where possible and maintained adequately throughout the works</li> <li>• where possible mobile plant should be sited away from NSRs</li> <li>• stockpiles of excavated materials and other structures such as site buildings should be used effectively to screen noise from the works</li> </ul>	All work sites/CP	CED	Contractor	N/A		✓	
3.9	Quiet plant (refer to Table 3.11) and barriers for Group 2 PME	All work sites/CP		Contractor	N/A		✓	
	Barriers for Group 3 PME	All work sites/CP		Contractor	N/A		✓	
	Quiet plant (refer to Table 3.11) and barriers for Group 4 PME	All work sites/CP		Contractor	N/A		✓	
	Quiet plant (refer to Table 3.11) for Group 12 PME	All work sites/CP		Contractor	N/A		✓	
	Quiet plant (refer to Table 3.11) for Group 13 PME	All work sites/CP		Contractor	N/A		✓	
	Quiet plant (refer to Table 3.11) and barriers for Group 14 PME	All work sites/CP		Contractor	N/A		✓	
	No Group 1 works at work site A8 during Q4 of year 2001	School NSR 9/CP during examinations		Contractor	N/A		✓	

EIA FAR Ref.	Environmental Protection Measures	Location/ Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages		
						D	C	O
	No Group 2 and Group 3 works undertaken concurrently at work site A9 during Q1 and Q2 of 2002 (i.e. either Group 2 or Group 3 works should be carried out at any one time)	School NSR 9/ CP during examinations	CED	Contractor	N/A		✓	
	No Group 5 to Group 9 works (inclusive) at work-sites A4 and A5 during Q1 and Q2 of 2002	School NSR 9/ CP during examinations		Contractor	N/A		✓	
<b>WATER QUALITY MITIGATION</b>								
5.10.1	Dredging Best Practice – includes the following*: <ul style="list-style-type: none"> <li>• minimisation of unnecessary disturbance to the sediments by exerting care when lowering and lifting the grab</li> <li>• all vessels used should be sized such that adequate clearance of the seabed is maintained at all stages of the tidal cycle and ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash</li> <li>• the Contractor should use barges that are fitted with tight fitting seals to their bottom openings to prevent leakage of material</li> <li>• the Contractor should ensure accurate barge loading to avoid splashing of dredged material to the surrounding water</li> <li>• the Contractor should ensure that grabs close tightly and that hoist speeds are suitably low</li> <li>• barges or hoppers should not be filled to a level which will cause the overflow of materials or polluted water during loading or transportation. Adequate freeboard should be maintained to ensure that the decks are not washed by wave action</li> </ul>	Dredging sites/CP+AO	CED	Contractor	N/A		✓	✓

EIA FAR Ref.	Environmental Protection Measures	Location/ Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages		
						D	C	O
	<ul style="list-style-type: none"> <li>the Contractor should manually remove large objects and debris prior to mechanical dredging to minimise losses from partially closed grabs</li> <li>dredging should be undertaken taking into account tidal conditions;</li> <li>construction works should cause no visible foam, oil, grease, scum, litter or other objectionable matter to be present in the water within the site or dumping grounds</li> <li>appropriate monitoring of water quality during dredging works should be undertaken to allow the implementation of appropriate action plans to prevent any unacceptable water quality impacts (refer to Section 5.12). Through this approach, water quality impacts during dredging can be controlled and limited</li> </ul>	Dredging sites/CP+AO	CED	Contractor	N/A		✓	✓
	<p>Where contaminated sediments as defined by EPD Technical Circular 1-1-92 are being dredged the Best Dredging Practices defined above should be implemented together with the following:</p> <ul style="list-style-type: none"> <li>contaminated sediments should be dredging using grabs of no more than 8m<sup>3</sup></li> <li>transport of contaminated mud to marine disposal sites should, wherever possible, be by split barges of not less than 750m<sup>3</sup> capacity, well maintained and capable of rapid opening and discharge at the disposal site</li> <li>monitoring of the barge loading to ensure that loss of material does not take place during transportation</li> <li>on-site auditing of the equipment and plant is essential to ensure that it is used in the appropriate manner</li> </ul>	Dredging sites/CP+AO		Contractor	N/A		✓	✓
	The number of grab dredgers operating simultaneously in Tai O Bay should be restricted to two	Dredging sites/CP		Contractor	N/A		✓	
	Silt curtain should be used at mouth of Tai O Creek to prevent excess sedimentation of the creek	Mouth of Tai O Creek		Contractor	N/A		✓	

EIA FAR Ref.	Environmental Protection Measures	Location/ Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages		
						D	C	O
5.10.2	Reduce silt laden runoff through implementation of ProPECC Note PN 1/94 "Construction Site Drainage"	Reclamation areas/CP	CED	Contractor	N/A		✓	
5.10.3	Reduce silt laden runoff through implementation of ProPECC Note PN 1/94 "Construction Site Drainage"	Salt pans/ During filling		Contractor	N/A		✓	
	Material placement and reworking should only occur during low tidal conditions	Salt pans/ During filling		Contractor	N/A		✓	
	Material should be dredged using grab dredged to minimise moisture content and allow rapid material consolidation	Salt pans/ During filling		Contractor	N/A		✓	
	Low rate of sediment reworking in order to minimise sediment disturbance (i.e. placement of approximately 100m <sup>3</sup> of dredged material in the salt pans per day and reworking of approximately 230m <sup>3</sup> of material a day)	Salt pans/ During filling		Contractor	N/A		✓	
	Placed mud should be mixed with the relatively coarser salt pan bed material to reduce erosion potential	Salt pans/ During filling		Contractor	N/A		✓	
	All material should be spread and mixed with existing bed material before completion of the day's work such that there is no material stockpiling	Salt pans/ During filling		Contractor	N/A		✓	
	The outer seawall should be breached in order to reduce velocity of water entering and leaving the salt pans and thus reduce the risk of erosion of newly placed or moved materials. Material from around the breached areas should be removed prior to reworking	Salt pans/ During filling		Contractor	N/A		✓	
5.10.4	Provide temporary toilet facilities/use existing municipal toilet facilities	Contractors works compound/CP		Contractor	N/A		✓	
5.11.1	Provision of notices and leaflets to prevent sewage and bilge discharges within the anchorage	Waterfront locations of reclamations/ AO		TDD / DO	TDD / DO			✓
5.11.3	Surface water from the eastern reclamation should be directed towards the mangrove planting area	Eastern reclamation/ During design		CED	N/A	✓		

EIA FAR Ref.	Environmental Protection Measures	Location/ Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages		
						D	C	O
	Surface water from the western reclamation should be directed to a dry weather interceptor prior to discharge to Tai O Bay/Creek	Western reclamation/ During design	CED	CED	N/A	✓		
5.11.4	Sewerage systems at the reclamation areas should connect to existing trunk sewerage system	Reclamations		CED	DSD	✓		
5.11.5	Centralised wastewater collection and treatment facility should be used at the boat maintenance facilities	Western reclamation/ During design		CED	System operators	✓		
<b>ECOLOGICAL MITIGATION</b>								
6.6.1	Dredging Best Practice methods specified in Section 5.10.1*	Breakwater, anchorage, approach channel dredging sites/CP	CED	Contractor	N/A		✓	
6.6.4	Grab dredge placement of sediments in salt pans; do not completely embay salt pans during filling (also refer to water quality mitigation measures)	Salt pans/ CP		Contractor	N/A		✓	
	Distribute sediments within salt pans using low-ground-pressure track equipment	Salt pans/ CP		Contractor	N/A		✓	
	Demarcate existing mangroves to be preserved using flagging. Inform equipment operators to protect mangroves on salt pans	Salt pans/ Prior to filling		Environmental Team Leader	N/A		✓	
	Monitor equipment operators to ensure mangroves are protected	Salt pans/ During filling		Environmental Team	N/A		✓	
	Rework salt pans principally between August and March*	Salt pans/ During filling		CED (design) Contractor (construction)	N/A	✓	✓	
6.6.5	Design rock facing of breakwater to simulate rocky shore to simulate natural boulder or rock shore	Breakwater/ During design	CED (design)	N/A	✓			
6.6.5	Advise dredging supervisors to avoid dolphins when operating dredging	Dredging	CED	Contractor	N/A		✓	

EIA FAR Ref.	Environmental Protection Measures	Location/ Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages			
						D	C	O	
	vessels	Sites/CP							
6.6.6	Implement control measures to minimise erosion and escape of sediments from the reclamation sites in accordance with ProPECC PN 1/94	Reclamation/ CP	CED	Contractor	N/A		✓		
6.6.7	Implement control measures specified in Section 5.10	Works sites/CP		Contractor	N/A		✓		
6.7.1	Water quality mitigation measures defined in Section 5.11	Anchorage/ AO		CED (design) Contractor (construction)	DSD	✓	✓		
	Plant mangroves in salt pans to mitigate impacts of sewage/bilge discharged into the anchorage	Salt pans/ Post- construction stage		AFD	N/A			✓	
6.7.3 7.8.1	Dredging Best Practice methods specified in Section 5.10.1*	Approach channels/ AO		Contractor	N/A			✓	
6.7.3	Water quality mitigation measures defined in Section 5.11	Reclamation areas/AO		Boat maintenance facilities operators	Boatyard operators			✓	
	Control measures for control of maintenance dredging sediment during operation specified in Section 5.10.1	Approach channels/AO		Contractor	N/A			✓	
6.7.5	Implement water quality controls as specified in Section 5.11	Reclamation areas/AO		Boat maintenance facilities operators	Boatyard operators			✓	
<b>FISHERIES MITIGATION</b>									
7.7.1	Avoid dredging in April-August where possible	All dredging sites/CP		CED	Contractor	N/A		✓	
7.7.2	Grab dredge placement of sediments in salt pans	Salt pans/CP	Contractor		N/A		✓		
	Do not embay salt pans during filling	Salt pans/CP	Contractor		N/A		✓		
7.7.3	Provide temporary toilet facilities/use existing municipal toilet facilities	Contractors works compound/CP	Contractor		N/A		✓		
			Contractor		N/A		✓		
7.8.1	Avoid maintenance dredging in April-August	Approach channels/AO	Contractor	CED			✓		

EIA FAR Ref.	Environmental Protection Measures	Location/ Timing	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages		
						D	C	O
7.8.2	Implement water quality controls as specified in Section 5.11.5	Reclamation areas/AO	CED	Boat maintenance facilities operators	Boatyard operators			✓
<b>CULTURAL HERITAGE MITIGATION</b>								
8.7	Design should ensure that breaches of the outer seawall for water circulation are minimised - the southern portion of the outer seawall in front of Fan Kwai Tong should be avoided and left in tact	Outer seawall/ During design	CED	CED	N/A	✓	✓	
	All parts of the outer seawall that are not to be breached should be "flagged" during construction activities to ensure that they are not damaged	All dredging sites/CP		Contractor	N/A		✓	
	Maintain a watching brief during the anchorage dredging operations (to be reviewed during detailed design following completion of AMO geophysical survey)	All dredging sites/CP		Contractor	N/A		✓	
	Outer seawall protection measures to prevent damage by boat-generated wake	Outer seawall/ During design		CED	N/A	✓		
<b>WASTE MANAGEMENT MITIGATION</b>								
9.1	Disposal of construction waste to be monitored by issue of receipt for delivery of waste	CP	CED	Contractor	N/A	✓	✓	
	Contract to include provisions for construction waste materials to be segregated to aid waste reuse/recycling	CP		CED	CED	✓		
9.4	Design of western reclamation area to include area for collection of boat generated municipal wastes	Western reclamation/ During design		CED	CED	N/A	✓	
9.5.2	Collection of floating refuse within anchorage by private contractor	Anchorage/ AO	MD	MD	MD			✓
	Collection of littoral refuse along the seaward edge of the outer seawall	Outer seawall/AO	RSD/DO	RSD/DO	RSD/DO			✓
9.5.3	Monitoring of marine generated refuse*	Anchorage/ AO	MD	MD	MD			✓
	Monitoring of land generated refuse*	RCP/AO	RSD	RSD	RSD			✓

**Notes:**  
 CP - Construction phase      AO - Anchorage operation      \* - mitigation measures not to be included in the Environmental Permit conditions