



Contract No. EP/SP/66/12
Integrated Waste Management Facilities, Phase 1

Appendix B

Implementation Schedule for Mitigation Measures

Table B1 Implementation Schedule for Environmental Mitigation Measures to minimise disturbance on Finless Porpoise of IWMF

EIA Ref.	Current Plan Ref.	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			
					Des	C	O	Dec
7b.8.3.17 - 7b.8.3.24	5.2 - 5.6	<p><i>Avoidance of peak season for finless porpoise occurrence</i></p> <ul style="list-style-type: none"> To minimise potential acoustic disturbance from construction activities on Finless Porpoise, construction works that may produce underwater acoustic disturbance, if any, should be scheduled outside the months with peak Finless Porpoise occurrence (December to May) Such works should be restricted within June to November. This approach would not only avoid the peak season for Finless Porpoise occurrence, the magnitude of impacts arise from acoustic disturbance would also be minimised. <p><i>Opt for quieter construction methods and plants</i></p> <ul style="list-style-type: none"> Considering the sensitivity of marine mammals to underwater acoustic disturbance, instead of the previously proposed conventional breakwater and reclamation peripheral structure, which requires noisy piling works, the current precast concrete structure is proposed as an alternative option in addition to the steel cellular cofferdam method for the construction of seawalls and breakwaters, and DCM ground treatment will be adopted to provide stabilised and strengthened foundations to the seawalls and breakwaters of the Artificial Island. It is anticipated that the ground treatment of DCM and the installation of precast concrete seawall and breakwater would not induce any underwater acoustic disturbance to finless porpoise. Also, the precast concrete seawall and breakwater does not rely on embedment depth for structural strength and stability, therefore vibratory driving of the precast concrete seawall and breakwater into seabed is not required. In other words, unlike that of steel cellular cofferdam, the installation of precast concrete seawall and breakwater for the Artificial Island involves no 	IWMF site, work site	Contractor, Environmental Team		✓		

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		<p>use of vibratory hammer or hydraulic hammer and hence cause no underwater acoustic disturbance to finless porpoises.</p> <ul style="list-style-type: none">• Since the DCM ground treatment and the installation of precast seawalls and breakwaters should generate no underwater acoustic disturbance to Finless Porpoise, no specific mitigation measures are required.• Non-percussive bore piling method for the installation of tubular piles for the berth construction has also been avoided with the newly adopted installation of precast concrete structures. <p><i>Monitored exclusion zones</i></p> <ul style="list-style-type: none">• A monitored exclusion zone of 250 m radius from silt curtain or from the boundary of a work area should be implemented under the following situations (where applicable, Marine Mammal Watching Plan shall be conducted at the meantime):<ol style="list-style-type: none">1. 30 minutes before commencement of and during silt curtain installation/re-installation/relocation, deep cement mixing injection works or noisy construction works (as stipulated in FEP Clause 2.25 and 2.27); or2. During implementation of MMEZ cluster plan with multiple construction vessels requiring MMO's duty operating simultaneously in close proximity.• The marine mammal exclusion zone (MMEZ) will be carried out in order to avoid the accidental entrance and entrapment of marine mammals within the silt curtains or works area and minimize underwater acoustic disturbance, so as for precautionary purpose for DCM works. If a marine mammal is noted within the exclusion zone, all marine works should stop immediately and remain idle for 30 minutes, or until the exclusion zone is free from marine mammals. The experienced marine mammal observer should be well trained to detect marine mammals. Binoculars should be used to search the exclusion zone from an elevated platform with unobstructed visibility. The marine mammal observer(s) shall be independent of the construction contractor and shall form part of the Environmental Team and have the power to call-off construction activities.						

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		<ul style="list-style-type: none"> In addition, as marine mammals cannot be effectively monitored within the proposed monitored exclusion zone at night, or during adverse weather conditions (i.e. Beaufort 5 or above, visibility of 300 meters or below), marine works should be avoided under weather conditions with low visibility as much as possible. Marine Mammal Exclusion Zone (MMEZ) Plan shall be properly implemented. <p><i>Marine mammal watching plan</i></p> <ol style="list-style-type: none"> <ul style="list-style-type: none"> Upon the completion of silt curtain installation/re-installation/relocation, the marine works would be conducted within an enclosed environment within the silt curtain. Subsequently, Visual Inspection of the Waters Surrounded by Silt Curtains (Section 2.1, MMWP) and Regular Inspection of Deployed Silt Curtain (Section 2.2, MMWP) inspection under Marine Mammal Watching Plan (MMWP) would be implemented (where applicable, Marine Mammal Exclusion Zone shall be conducted at the meantime). All measures recommended in the Marine Mammal Watching Plan shall be fully and properly implemented for the Project. Special attention should be paid to Phase 2 (reclamation) where the floating type still curtain would be opened occasionally for vessel access, leaving a temporary 50 m opening. Action plan devised in the Marine Mammal Watching Plan shall be properly implemented to cope with any unpredicted incidents such as the case when marine mammals are found within the waters surrounded by the silt curtains. <p><i>Small openings at silt curtains</i></p> <ul style="list-style-type: none"> In order to avoid the entrance of marine mammals into the works area through the opening at silt curtains for vessel access, and the subsequent potential 						

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		impacts including increase in stress level in marine mammals due to underwater noise and chance of collision with working vessels, the openings for vessel access at the silt curtains should be restricted to be from 50m-100m to minimize the risk of accidental entrance by marine mammal.						
7b.8.3.25 - 7b.8.3.30	5.7 - 5.9	<p><i>Adoption of regular travel route</i></p> <ul style="list-style-type: none"> In order to minimize the disruption on marine mammal's behavioural pattern during construction and operational phases, and minimize the chance of vessel collision with marine mammals, which may otherwise result in damage to health or mortality, captains of all vessels should adopt regular travel route. Route and design in Vessel Travel Details shall be properly implemented. The regular travel route should avoid areas with high sighting density of Finless Porpoise as much as possible, as indicated in the latest Monitoring of Marine Mammals in Hong Kong Waters (AFCD, 2017). With the adoption of regular travel route, potential alteration in behavioural pattern of marine mammals due to increase in marine traffic is considered to be acceptable. <p><i>Vessel speed limit</i></p> <ul style="list-style-type: none"> In order to minimise potential injury and mortality of marine mammals due to collision with vessels during construction (working vessels) and operational phases (4 round trips per day for MSW vessel, and 12 round trips per day for visitor/staff shuttle ferry), a speed limit of ten knots should be strictly enforced within areas with high density of Finless Porpoise. Instructions and guidelines in Vessel Travel Details for the vessels driver shall be properly followed. Passive acoustic monitoring and land-based theodolite monitoring surveys should be adopted to verify the predicted impacts and effectiveness of the proposed mitigation measures. 	IWMF site, work site, marine traffic route	Contractor, Environmental Team		✓	✓	

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		<p><i>Training of Staff</i></p> <ul style="list-style-type: none"> For the implementation of Marine Mammal Watching Plan and Marine Mammal Exclusion Zone Plan, training sessions shall be conducted for MMO by marine mammal specialist, Dr. Samuel Hung, Dr. Lindsay, Ms. Julia Chan or someone with equivalent qualifications, with briefing materials provided as guidelines, instructing adequate knowledge of all requirements for observing marine mammal and appropriate actions to be taken according to this plan. Competence checking by ET shall be provided at least once every 6 months to the trained MMO involved in implementation of this plan. As frontline staff of the main contractor or its sub-contractors, i.e. foremen, site agent, superintendents and engineers would involve in the implementation of this plan, briefings for these personnel will be provided by the trained MMO during induction trainings to get familiar with the plans for assisting on marine mammal observations within waters surrounded by silt curtains and taking necessary action according to the plans when there is marine mammal trapped by the silt curtain or appearance of marine mammal within the MMEZ. Refresh briefings will be provided to all frontline staff once every 6 months. The briefing and training records will be provided to ETL, IEC and SO for audit and record. The contractor shall provide training to vessel captains to ensure vessel operation poses minimal risks to Chinese White Dolphin and Finless Porpoise. The training shall include briefings on predefined routes, general education on local cetaceans and white-bellied sea eagles, the required environmental practices / measures while operating construction and associated vessels under the Project, guideline for operating vessel safely in the presence of Chinese White Dolphin and Finless Porpoise. The contractor shall also schedule the training with individual marine contractors and shall ensure all marine vessel captains working on the Project are adequately briefed and trained prior to marine construction or prior to operating vessels within the construction site area. The same arrangement shall be adopted for vessel captains during operation stage. The training record shall be kept on site / office for both construction stage and operation stage. Participant shall sign his name and title on the training record. 						



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*Des – Design, C-Construction, O-Operation, and Dec - Decommissioning