

## **14. environmental monitoring and audit requirements**

### **Introduction**

14.1.1 This section further elaborates the requirements of environmental monitoring and audit (EM&A) for the construction and operation phases of the Project, based on the assessment results of the various environmental issues. Details of the EM&A programme are presented in an EM&A Manual, which are released as a separate document. Mitigation measures have been recommended in this Environmental Impact Assessment (EIA) report to prevent potential adverse impacts from the construction of the project.

### **Implementation of EIA Findings and Recommendations**

14.1.2 Chapters 4 to 13 have, where appropriate, identified and recommended the implementation of mitigation measures in order to minimize the potential construction and operational phase impacts of the Project. These findings and recommendations form the primary deliverable from the whole EIA process. Once endorsed by the Environmental Protection Department, they will form an agreement as to the measures and standards that are to be achieved. It is therefore essential that mechanisms are put in place to ensure that the mitigation measures prescribed in the Implementation Schedule are fully and effectively implemented during construction.

14.1.3 The required format for the Implementation Schedule is specified in the EIA Study Brief. The format requires the specification of implementation agent(s), timing, duration and location for each of the recommended mitigation measures.

14.1.4 Apart from the mitigation measures defined in the EIA, there is also scope for other requirements to be included within the finalised Implementation Schedule. Prior to the issue of an Environmental Permit, there is an EIA Determination Period. During this period the EIA Report is reviewed and commented upon by both public and professional bodies. Where recommendations are made and accepted by either the Advisory Council on the Environment (ACE) or its EIA subcommittee, these measures will be included within the Implementation Schedule, where appropriate.

### **Statutory Requirements**

14.1.5 As the Project constitutes a Designated Project under the EIAO, an Environmental Permit must be obtained before construction or operation of the proposed project can commence.

14.1.6 Upon approval of the EIA Report, the Project Proponent can apply for an Environmental Permit. If the application is successful, the Environmental Permit will, in most circumstances, have conditions attached to it, which must be complied with. In addition, the Project Proponent and its appointed Contractors must also comply with all other controlling

environmental legislation and guidelines, which are discussed within the specific technical chapters of this report. Failing to comply with these legislative requirements could lead to prosecution under the various Pollution Control Ordinances.

## **Environmental Management Plan**

14.1.7 For construction of the Project, it is envisaged that the contractual documentation will require the Project Proponent's Contractors to define mechanisms for achieving the environmental requirements. This will most likely be achieved by requiring the Contractor to produce and implement an Environmental Management Plan (EMP).

14.1.8 EMP's are similar in nature to safety or quality plans and provide details of the means by which the Contractor (and all subcontractors working for the Contractor) will implement the recommended mitigation measures and achieve the environmental performance standards defined both in Hong Kong environmental legislation and in the Implementation Schedule. A primary reason for adopting the EMP approach is to make sure that the Contractor is fully aware of his environmental responsibilities and to ensure that he is committed to achieving the specified standards.

14.1.9 The EMP approach is grounded on the principle that the Contractor shall define the means by which the environmental requirements of the EIA process, and the contractual documentation shall be met. In the first instance, each Tenderer shall be required to produce a preliminary EMP for submission as part of the tendering process; the EMP will demonstrate the determination and commitment of the organisation and indicate how the environmental performance requirements laid out in the available EIA documentation will be met. It is recommended that this aspect be included as a specific criterion in the assessment of tender documents; this will act as a clear indication to all Tenderers of the Project Proponent's commitment to the minimisation and management of environmental impacts. Upon contract award, the successful Tenderer shall be required to submit a draft and final version of the EMP for approval by the Project Proponent prior to the commencement of the works.

## **EM&A Manual**

14.1.10 The EPD requires the submission for approval of an EM&A Manual prior to the commencement of construction. The EM&A Manual has the purpose of defining the mechanisms for implementing the EM&A requirements specific to each phase of the work.

14.1.11 The EM&A Manual provides a description of the organisational arrangements and resources required for the EM&A programme based on the conclusions and recommendations of this EIA. The EM&A Manual stipulates details of the construction monitoring required, and actions that shall be taken in the event of exceedances of the environmental criteria. In effect, the EM&A Manual forms a handbook for the on-going environmental management during construction.

14.1.12 The EM&A Manual comprises descriptions of the key elements of the EM&A programme including:

- appropriate background information on the construction of the Project with reference to relevant technical reports;
- organisational arrangements, hierarchy and responsibilities with regard to the management of environmental performance functions during the construction phase to include the EM&A team, the Contractor's team and the Employer's representatives;
- a broad construction programme indicating those activities for which specific mitigation is required, as recommended in the EIA, and providing a schedule for their timely implementation;
- descriptions of the parameters to be monitored and criteria through which performance will be assessed including: monitoring frequency and methodology, monitoring locations (in the first instance, the location of sensitive receivers as listed in the EIA), monitoring equipment lists, event contingency plans for exceedances of established criteria and schedule of mitigation and best practice methods for minimising adverse environmental impacts;
- procedures for undertaking on-site environmental performance audits as a means of ensuring compliance with environmental criteria;
- procedures for handling/resolution of complaints; and
- reporting procedures.

14.1.13 The EM&A Manual will be a dynamic document which will undergo a series of revisions to accommodate the progression of the construction programme.

## **Objectives of EM&A**

14.1.14 The objectives of carrying out EM&A for the Project include:

- to provide baseline information against which any short or long term environmental impacts of the projects can be determined;
- to provide an early indication should any of the environmental control measures or practices fail to achieve the acceptable standards;
- to monitor the performance of the Project and the effectiveness of mitigation measures;
- to verify the environmental impacts predicted in the EIA Study;
- to determine Project compliance with regulatory requirements, standards and government policies;
- to take remedial action if unexpected problems or unacceptable impacts arise; and

- to provide data to enable an environmental audit to be undertaken at regular intervals.

14.1.15 The following sections broadly summarise the recommended EM&A requirements; further details are provided in the EM&A Manual.

## **Air Quality**

14.1.16 Potential dust impacts will be generated from site clearance, excavation, materials handling and wind erosion. The construction works are controlled under the *Air Pollution Control (Construction Dust) Regulation*. Mitigation measures have been proposed. With the implementation of the proposed dust suppression measures, good site practices and comprehensive dust monitoring and audit, the TSP levels at all ASRs should comply with the dust criteria.

14.1.17 Dust monitoring requirements in terms of 1-hr and 24-hr TSP levels at the worst affected ASRs have been recommended in the EM&A Manual to ensure that the mitigation measures are properly implemented and effective.

14.1.18 Baseline monitoring to establish the background air quality environment will be required and should be carried out for at least 14 consecutive days prior to the commencement of the project.

## **Noise**

14.1.19 Elevated construction noise impacts from this Project are not anticipated at the identified NSRs in this EIA. Specific measures will not be required during the construction phase. Noise monitoring is therefore not recommended during construction and operational phases of the proposed project.

## **Water Quality**

### Construction phase

14.1.20 During the construction phase, regular site auditing is recommended to ensure the recommended mitigation measures are properly implemented.

14.1.21 The water quality assessment has concluded that the identified water quality impacts could be minimized by implementing the recommended mitigation measures for the construction works, such as control measures on silty runoff, turf establishment runoff and

drainage from the works areas to minimise construction run-off, and proper site management and good housekeeping practices. Residual water quality impact is in acceptable level. Any effluent discharges from the site will be required to comply with the terms and conditions of a discharge licence, issued by EPD, under the WPCO.

14.1.22 It is proposed to carry out a baseline monitoring of water quality (prior to commencement of works) at selected sensitive receivers and monitor the water quality at these same locations during construction, to identify the presence of any impacts on water bodies within the Project Area. A minimal environmental monitoring and audit programme is therefore required to ensure effective mitigation, thus, monitoring locations should be selected to represent the major water bodies within the Project Area.

14.1.23 Monitoring and auditing for marine water quality is considered necessary during the dredging activities of the proposed Project to ensure that the released SS concentrations from the dredging activities do not adversely affect the sensitive receivers. This monitoring programme is required to ensure the implementation of the recommended water quality mitigation measures and to assess the effectiveness of these measures during the construction works. If monitoring results indicate that the dredging activities have exceeded the predicted elevated SS concentrations even, after the implementation of the recommended mitigation measures, the construction programme should be carefully reviewed to slow down dredging rates.

14.1.24 Post-construction marine water quality monitoring is recommended.

14.1.25 Details of water quality monitoring requirements are presented in the EM&A Manual.

### Operational Phase

14.1.26 No exceedance from the desalination plant is predicted during the operation of the Project. Contract documents for the Project should incorporate mitigation measures for water pollution control. Water quality monitoring at sensitive receivers is recommended. Details of the operational phase water quality monitoring procedures are given in the stand-alone EM&A Manual.

### **Waste Management**

14.1.27 It will be the contractor's responsibility to ensure that all wastes produced during the construction of the Project are handled, stored and disposed of in accordance with good waste management practices and EPD's regulations and requirements. The mitigation measures recommended should form the basis of the site Waste Management Plan to be developed by the Contractor.

14.1.28 It is recommended that the waste generated during the construction activities

should be audited periodically to determine if wastes are being managed in accordance with approved procedures and the site Waste Management Plan. The audits should look at all aspects of waste management including waste generation, storage, recycling, transport and disposal. An appropriate audit programme would include undertaking a first audit near the commencement of the construction works, and then a monthly audit thereafter. In addition, regular site inspection should check the strict implementation of the recommended good site practices and other waste management mitigation measures.

## **Terrestrial Ecology**

14.1.29 An assessment of ecological impacts has been conducted (Chapter 8). No unacceptable impacts on terrestrial ecology are anticipated. Natural streams identified sensitive would be protected by buffer zones during the construction and operation of the project. Monitoring on the implementation of the mitigation measures for stream protection, the effectiveness of stream buffer zones, and the aquatic fauna in streams will be conducted during the entire construction phase.

## **Marine Ecology**

14.1.30 The transplanted coral colonies will be regularly checked by a qualified marine ecologist for one year after transplantation. The general conditions of the transplantation sites will also be reported. Monitoring will also be conducted at natural corals and seagrasses prior to construction, during the entire construction phase, and the first two years during the operation phase. The survival and health conditions of the coral colonies and the extent, coverage percentage and the health conditions of the seagrasses will be recorded.

## **Fisheries**

14.1.31 An assessment of Fisheries has been conducted (Chapter 10). No unacceptable impacts arising from the construction and operation of the project are anticipated, provided that a well-planned programme of site practices is implemented. No monitoring and audit will be required.

## **Land Contamination**

14.1.32 If necessary, the requirements for EM&A with respect to land contamination would be determined upon completion of all relevant land contamination assessment works.

14.1.33 Site investigation at the potential contaminated zones should follow the requirements laid out in the approved CAP. If the initial Contamination Assessment Report (CAR) indicates contamination, a Remediation Action Plan (RAP) would be prepared and submitted to EPD for approval.

14.1.34 The Project Proponent should take into account the time required for land

contamination study at the identified sites. Construction works may only be carried out at these areas until the investigation results are found acceptable. Recommended mitigation measures should be implemented during the construction stage of the Project.

## **Landscape and Visual Assessment**

14.1.35 The proposed landscape and visual mitigation measures for the construction and operation phases of the Project are described in Chapter 12. These measures are design measures to be incorporated in the detailed design of the Project. Independent checking of the design should be undertaken to ensure that the mitigation measures are satisfactorily incorporated into the design.

## **Cultural Heritage**

14.1.36 As discussed in Chapter 13, the assessment of potential impact on cultural heritage has concluded that the proposed construction works for the Project is acceptable. A watching brief will be undertaken by a qualified and licenced archaeologist during excavation works at the construction stage in the Wan Chai Archaeological Site. A qualified archaeologist should inspect the site when there is excavation work on site. Grave#5 and Grave#20 will be removed and a full recording will be conducted. With the appropriate implementation of mitigation measures, monitoring and auditing will not be required during the operational phase of the Project.