

15 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

15.1 Overview

This section provides descriptions of the environmental and operation variables and parameters to be monitored, and the purpose for which each should be monitored, e.g. as an indication of general background conditions or as an indicator of unacceptable environmental impact.

In accordance with the requirements as stipulated in Annex 21 of the TM-EIAO, it is considered necessary to conduct the Environmental Monitoring and Audit (EM&A) programme during the construction, operation, restoration and aftercare phases of the Project and to define the relevant scope of EM&A requirements, including:

- Provision of a database against which to determine any short- or long-term environmental impacts of the Project;
- Provision of an early indication that any of the environmental control measures or other operation practices are failing to achieve the required standards;
- Provision of data to determine the effectiveness of any mitigation or control measures implemented through amendments in procedures during the life of Project;
- Provision of data to enable an environmental audit of the construction, operation, restoration and aftercare works to be undertaken; and
- Assessment of compliance with the environmental and pollution control and operation requirements.

15.2 Project Organization

A project organization consisting of the Engineer's Representative (ER), Independent Environmental Checker (IEC), Environmental Team (ET), Project Proponent (CEDD and PlanD) and Contractors should be established to take on the responsibilities for environmental protection for the Project. The IEC will be appointed by the Project Proponent to conduct independent auditing on the overall EM&A programme including environmental and operation monitoring, implementation of mitigation measures, EM&A submissions, and any other submission required under the Environmental Permit (EP). The organization, responsibilities of respective parties and lines of communication with respect to environmental protection works are given in the EM&A Manual.

15.3 EM&A Manual

EM&A is an important aspect in the EIA process which specifies the timeframe and responsibilities for the implementation of environmental mitigation measures. The requirements on environmental monitoring (including baseline and impact monitoring) are given in the EM&A Manual.

A project specific EM&A Manual to the Project will be prepared based on individual contractual requirements and latest design information by the ET. The project specific EM&A Manual will highlight the following issues:

- Organization, hierarchy and responsibilities of the Contractor, Project Proponent, ET and IEC with respect to the EM&A requirements during construction and operational phases of the Project;
- Information on project organization and programming of construction activities;
- Requirements with respect to the construction schedule and necessary EM&A programme to track the varying environmental impacts;
- Details of methodologies to be adopted, including all field, laboratory and analytical procedures, and details on quality assurance;
- Procedure for undertaking on-site environmental audits;
- Definition of Action and Limit Levels;
- Establishment of Event and Action Plans;
- Requirements of reviewing pollution sources and working procedures required in the event of non-compliance of environmental criteria and complaints;
- Requirements for reviewing the implementation of mitigation measures, and effectiveness of environmental protection and pollution control measures adopted; and
- Presentation of requirements for EM&A data and appropriate reporting procedures.

15.4 Project Implementation Schedule

A Project Implementation Schedule (PIS) has been prepared and included in **Appendix 15-1** and in the EM&A Manual to summarize all the required mitigation measures need to be implemented during the construction and operational phases of the Project. The implementation responsibilities are also identified in the PIS. The EM&A Manual will also present the requirements for EM&A (e.g. monitoring and audit frequency), throughout the entire construction phase.

The Contractor should review the mitigation measures and PIS with respect to the design developments and construction methodology. In case the Contractor needs to update the mitigation measures and PIS, the EM&A Manual should be updated accordingly.

15.5 EM&A Programme

Detailed requirements of the EM&A programme are described in the EM&A Manual. Measurements and activities are summarised as follows:

Baseline monitoring (construction dust, airborne noise and water etc.);

Impact monitoring (construction dust, airborne noise and water etc.);

Monitoring of success of landscape and visual measures stated in EM&A Manual;

Survey-cum-rescue excavation and baseline condition survey and baseline vibration impact assessment during pre-construction phase; and vibration monitoring during construction phase;

Monitoring of success of ecological mitigation measures including utilisation of compensatory wetland habitat;

Remedial actions in accordance with the Event and Action Plan within the timeframe in case the specified criteria in the EM&A Manual were exceeded;

Logging and keeping records of monitoring results; and

Preparation and submission of Monthly, Quarterly and Final EM&A Reports.

15.5.1 Air Quality

Monitoring and audit of the TSP levels will be carried out to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

15.5.2 Noise

Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq\ 30\ mins}$ shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, $L_{eq\ 5\ mins}$ shall be employed for comparison with the Noise Control Ordinance (NCO) criteria. As supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

15.5.3 Water

Water quality monitoring at the rivers is required during the construction period. The proposed locations are classified as Impact Station and Control Station according to their functions.

15.5.4 Sewerage and Sewage Treatment Implication

No sewerage impacts are expected from the site during the construction phase. As such, environmental monitoring and audit of the sewerage system is considered not required.

15.5.5 Waste Management Implication

Regular audits and site inspections should be carried out during construction phase to ensure that the recommended good site practices and other recommended mitigation measures are properly implemented by the Contractor.

15.5.6 Land Contamination

Detailed SI for those identified potentially contaminated but inaccessible sites should be conducted when they are resumed and handed over to the Project Proponent.

15.5.7 Hazard to Life

No hazard to life is expected from the site during the construction phase. As such, environmental monitoring and audit is considered not required.

15.5.8 Landfill Gas Hazard

To protect the site workers and future owners within the Landfill Consultation Zone and within MTLL, it is recommended that monitoring of any LFG which may be migrated to the site should be undertaken during the construction of infrastructure and the development in KTN NDA when the works involve confined spaces.

15.5.9 Landscape and Visual Impact Assessment

Site audits should be undertaken during the construction phase of the Project to check that the proposed landscape and visual mitigation measures are properly implemented and maintained as per their intended objectives.

15.5.10 Cultural Heritage

15.5.10.1 Archaeology

It is recommended an Archaeological Impact Assessment to be conducted after land resumption and before construction to determine the need for archaeological follow up actions in Area B1-8 and B1-9 zoned as in R4 & R3 within the Sheung Shui Wa Shan Site of Archaeological Interest. It is also recommended that an Archaeological Impact Assessment should be required if there is any development work within the Sheung Shui Wa Shan Site of Archaeological Interest.

Preservation in-situ is recommended for Site 7 in FLN NDA. If disturbance to the site by the design of the Central Park is unavoidable, further archaeological survey should be conducted after land resumption prior to the pre-construction stage to assess the feasibility to incorporate Site 7 into the design of the development plan of the proposed zone. Appropriate follow-up actions, including preservation of the significant archaeological deposits in-situ in the Central Park, would then be considered with the consent of AMO.

Survey-cum-Rescue Excavation is recommended to be conducted after land resumption but before construction commencement, in KTN NDA, for Sites 1, 2, 3, Spots C and I; and in FLN NDA, for Site 5.

Further archaeological surveys have also been recommended to be conducted after land resumption but before construction in the not-yet-surveyed-area with medium archaeological potential located in the areas with proposed development to comprehensively assess their archaeological potential and potential impacts caused by development. Appropriate mitigation measures will be recommended if necessary.

The archaeological fieldworks as mentioned above should be conducted by professional archaeologist and prior to fieldwork commencement, the archaeologist should obtain a Licence to Excavate and Search for Antiquities from the Authority under the AM Ordinance. Prior to the application for the licence, archaeological proposals detailing the objectives, work scope, methodology, staffing plan and work programme of the archaeological works should be agreed with the AMO.

Induction training should be provided to the construction contractor before the commencement of the excavation works in Spots A and D to H and Sites 4 and 10. An induction will be conducted as part of the environmental health and safety induction programme to all site staff before they are deployed on site. The induction will include an introduction on the historical development of the Site, the possible archaeological remains that may be encountered during ground excavation works as well as the reporting procedures in case suspected archaeological remains are identified. A set of the presentation material (in the form of power point presentation) with content details will be prepared by an archaeologist and submitted to AMO for reference and record purpose. The first induction briefing will be video recorded and it will be used as induction briefing material for new site staff.

15.5.10.2 Built Heritage

For built heritage sites that required vibration monitoring, the monitoring should be on a regular basis and if the evaluated and/or measured vibrations have been found to exceed the allowable values or if damage to either structural or non-structural elements of the historic buildings have been identified, the construction work should be stopped and the construction method and appropriate mitigation measures should be the reviewed.

Meanwhile, since the construction works and development activities may induce change in the watertable. It is recommended the contractor should ensure that the change of watertable induced by the construction works and development activities will not result in settlement of built heritage.

For the retained built heritage items in developable area, drainage system and access route would be designed to prevent the persevered flooding and maintain the accessibility to the built heritage.

For the built heritage items to relocated, relocation to a reasonable location nearby may be required.

15.5.11 Ecology

The implementation of mitigation measures shall be audited periodically during the implementation of the project. Monitoring has been proposed for the following aspects:

- Monitoring of construction and operation of LVNP (including creation of compensatory wetland habitat);
- Monitoring of measures to minimise disturbance to waterbirds on Ng Tung, Sheung Yue and Shek Sheung Rivers;
- Monitoring of woodland compensation measures;
- Monitoring of compensatory egret habitat provision;
- Monitoring of measures to minimise impacts to Ma Tso Lung Stream and Siu Hang San Tsuen Stream;
- Monitoring of measures to minimise impacts on ecologically sensitive habitats from disturbance and pollution.

15.5.12 Fisheries

The scale of loss of fish ponds as a consequence of the NDAs development is not significant and hence, no mitigation is required. However, mitigation measures for water quality proposed in the EIA Report are also pertinent in ensuring that fisheries impacts of the project do not occur downstream of the NDAs area in Inner Deep Bay and, specifically, downstream of the works to be undertaken within the Ma Tso Lung Stream catchment. There are no monitoring and audit requirements in respect of fisheries.