

# PROPOSED COMPREHENSIVE RESIDENTIAL AND COMMERCIAL DEVELOPMENT ATOP SIU HO WAN DEPOT

Environmental Monitoring and Audit Manual



July 2017



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# 1 Introduction

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## 1.1 Background

**1.1.1.1** The 30-hectare Siu Ho Wan Depot (SHD) has been highlighted in both 2015 and 2016 Policy Address as a potential railway site being explored by MTR Corporation Limited (MTRCL) (the Project Proponent) in collaboration with the Government to provide housing supply.

**1.1.1.2** In the 2017 Policy Address, the Chief Executive announced the initiative to commence the statutory planning procedures for SHD this year, with the aim to provide not less than 14,000 residential units in the medium to long term.

**1.1.1.3** The Lantau Development Advisory Committee (LanDAC) has also recommended “Strategic Economic and Housing Development” as the planning theme for the North Lantau Corridor. The proposed comprehensive development atop SHD is in line with the planning theme, which has been earmarked as one of the medium-term projects in the First-term Work Report published by LanDAC in January 2016.

**1.1.1.4** The Project Proponent supports Government’s policy initiative to make better use of railway land to provide housing supply by commissioning a consultancy study to optimise the development potential of SHD and formulate a development scheme for a Comprehensive Residential and Commercial Development (the Project) which forms the basis of the Environmental Impact Assessment (EIA) Report. A new Siu Ho Wan Station (SHO) has been proposed along the Tung Chung Line (TCL) to meet the transportation needs of the development and enable building of a sustainable community.

**1.1.1.5** In accordance with the requirements of Section 5(1) of the EIAO, a Project Profile (No. PP-542/2016) for the Project was submitted to the Director of Environmental Protection (DEP) for application for an EIA Study Brief on 20 July 2016. Pursuant to Section 5(7)(a) of the EIAO, the DEP issued a Study Brief (No.: ESB-294/2016 dated 1 September 2016) for the EIA study.

## 1.2 Purpose of the Manual

**1.2.1.1** The purpose of this Environmental Monitoring and Audit (EM&A) Manual is to:

- Guide the set-up of an EM&A programme for the Schedule 2 Designated Project (DP) (See **Section 2.2**) elements to ensure compliance with the EIA recommendations;

**1.2.1.2** This Manual outlines the auditing programme for the construction and operation of the proposed Project and provides systematic procedures for auditing and minimising environmental impacts.

**1.2.1.3** Hong Kong environmental regulations and the Hong Kong Planning Standards and Guidelines (HKPSG) have served as environmental standards and guidelines in the preparation of this Manual. In addition, this EM&A Manual has been prepared in accordance with the requirements stipulated in Annex 21 of the Technical Memorandum on the EIA Process (EIAO-TM).

**1.2.1.4** This Manual contains the following information.

- Responsibilities of the Contractor, the Engineer or Engineer's Representative (ER), Environmental Team (ET), and the Independent Environmental Checker (IEC) under the context of EM&A;
- Project organisation for the EM&A works;
- The basis for, and description of the broad approach underlying the EM&A programme;
- Details of the methodologies to be adopted, including all laboratories and analytical procedures, and details on quality assurance and quality control programme;
- Requirements for reviewing pollution sources and working procedures required in the event of non-compliance with the environmental criteria and complaints; and
- Requirements for presentation of environmental auditing data and appropriate reporting procedures.

**1.2.1.5** This EM&A Manual is a dynamic document that should be reviewed regularly and updated as necessary during the construction and operation of the Project. The Contractor should review the mitigation measures and implementation schedule related to the ultimate Sewage Pumping Station (SPS) with respect to the design developments and construction methodology.

## 2 Project Description

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### 2.1 General Description of the Project

**2.1.1.1** Section 2 of the EIA Report has described the approaches adopted to avoid and minimise various environmental impacts throughout the design process. The final design has therefore been taken forward as the basis for this EIA to demonstrate that all statutory requirements under EIA Study Brief (ESB-294/2016) and the Environmental Impact Assessment Ordinance (EIAO) are complied with. A brief summary of key elements of the Project is given below:

- Topside development including podium deck, residential towers, schools, transport, utility and other supporting facilities;
- upgrading of the sewerage network, including sewage pipes to Siu Ho Wan Sewage Treatment Works (SHWSTW), with installation of new sewage pumping stations to cater for sewage generated by the Project;
- A new Siu Ho Wan Station (SHO) and the associated track works;
- Railway depot replanning works within the existing site boundary; and;
- Construction of concrete slab within the existing depot for podium decking and property enabling works for the topside development.

**2.1.1.2** After the issue of EIA Study Brief (ESB-294/2016), further design development has been evolved to streamline the implementation strategy. According to the latest strategy, the key elements to be implemented in this Project only include the SHD Topside Development and the upgrading of the sewerage networks with installation of new sewage pumping station and construction of rising mains. Other key elements including the railway depot replanning, construction of concrete slab above the depot, and the new SHO and the associated track works will be addressed in another EIA report for Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works (Railway EIA), which would be submitted separately for approval under the Environmental Impact Assessment Process of the EIAO. Nevertheless, the relevant information and assessment results relating to SHO and the associated track works have been suitably included to fulfil the requirements in ESB-294/2016.

**2.1.1.3** The Project would also include the eastern connection access on Sham Shui Kok Drive and the western access via Tai Ho Wan Interchange. The eastern connection access on Sham Shui Kok Drive is an at-grade road of about 1000m while the western access via Tai Ho Interchange is a short viaduct of approximately 50m long.

**2.1.1.4** The location of the proposed SHD Topside Development is shown in **Figure 2.1** together with its nearby infrastructure works. The

development scheme of the proposed comprehensive residential and commercial development atop Siu Ho Wan Depot is also given in **Figure 2.2**.

## 2.2 Designated Project

**2.2.1.1** The Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot is a Designated Project (DP) under Item 1 Schedule 3 of EIAO – Engineering feasibility study of urban development projects within a study area covering more than 20ha or involving a total of population of more than 100,000.

**2.2.1.2** It comprises the following which are classified as Designated Projects (DPs) as per Schedule 2, Part I of the EIAO.

- Item F.3(b) – A sewage pumping station with an installed capacity of more than 2000m<sup>3</sup> per day and a boundary of which is less than 150m from an existing or planned residential area or educational institution (i.e. ultimate sewage pumping station);
- Item A.2 – Railway Station (i.e. SHO and associated trackworks on AEL/TCL); and
- Item A.4 – A railway siding, depot, maintenance workshop, marshalling yard or goods yard (i.e. operation of SHD).

**2.2.1.3** According to the latest design, the sewage generated by the Project will be conveyed to Siu Ho Wan Sewage Treatment Works. An ultimate sewage pumping station will be required to provide sufficient pressure head for sewage delivery and it will be located at the eastern edge of the site boundary. According to Section 8 of the EIAO-TM, this EM&A Manual is only applicable to the above Schedule 2 DP element.

**2.2.1.4** Schedule 2 DPs Item A.2 and Item A.4 are railway related DPs which will be separately covered in Railway EIA to be submitted for approval under the EIAO in order to streamline for project implementation and for the ease of reference of the public. Details of EM&A Programme for Schedule 2 DPs Item A.2 and Item A.4 are discussed in the Railway EM&A Manual, whereas, this EM&A Manual covers Schedule 2 DP Item F.3(b) mentioned in **Section 2.2.1.2**.

## 2.3 Tentative Implementation Programme

**2.3.1.1** For the ultimate SPS which is a Schedule 2 DP element, its tentative construction period would commence from Q3 2023 until Q4 2024.

## 3 Project Organisation

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### 3.1 Project Organisation

**3.1.1.1** The proposed project organisation and lines of communication with respect to environmental protection works are shown in **Appendix 3.1**.

**3.1.1.2** The responsibilities of respective parties are:

#### The Contractor

- Implement the EIA recommendations and requirements;
- Provide assistance to Environmental Team in carrying out relevant auditing and commissioning tests;
- Adhere to the procedures for carrying out environmental compliant investigation.

#### Environmental Team (ET)

- Carry out site inspection to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and environmental mitigation measures, and take proactive actions to pre-empt problems;
- Prepare audit reports on site environmental conditions;
- Liaise with IEC on all environmental performance matters, and timely submission of all relevant EM&A proforma for IEC's approval;
- Report on the environmental audit results to the IEC, Contractor, and the ER or its delegated representative;
- Undertake regular on-site audits / inspections and report to the Contractor and the ER of any potential non-compliance;
- Advise the Contractor on environmental improvement, awareness, enhancement matters, etc., on site; and
- Adhere to the procedures for carrying out environmental complaint investigation.

#### Independent Environmental Checker (IEC)

- Review the EM&A works performed by the ET (at not less than monthly intervals) in an independent, objective and professional manner;
- Audit the EIA recommendations and requirements against the status of implementation of environmental protection measures on site;



- Review the effectiveness of environmental mitigation measures and project environmental performance.
- On-as needed basis, verify and certify the environmental acceptability of Environmental Permit (EP) holder's construction methodology (both temporary and permanent works), relevant design plans and submission under the EP;
- Verify the Auditing reports (monthly and quarterly summary reports) submitted by the ET;
- Conduct random site inspection;
- Provide feedback on the audit results to the ET, the ER or the EP holder according to Event and Action Plans in the EM&A Manual.

#### Engineer or Engineer's Representative (ER)

- Supervise the Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Participate in joint site inspections and audits undertaken by the ET; and
- Adhere to the procedures for carrying out complaint investigations.

**3.1.1.3** For the purpose of this manual, the ER shall refer to the Engineer as defined in the Construction Contract, in cases where the Engineer's powers have been delegated to the ER, in accordance with the Construction Contract.

**3.1.1.4** The ET shall be an independent party from the Contractor. The ET should be led and managed by the ET Leader. The ET Leader shall have at least 7 years of experience in conducting EM&A. Furthermore, the IEC should possess at least 7 years of experience in EM&A.

**3.1.1.5** Sufficient and suitably qualified professional and technical staff shall be employed by the respective parties to ensure full compliance with their duties and responsibilities, as required under the EM&A programme of the ultimate SPS.

## 4 Air Quality

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### 4.1 Introduction

**4.1.1.1** The EIA has considered the potential air quality impacts during the construction and operational phases of the ultimate SPS.

**4.1.1.2** Based on the assessment results, no adverse impact from the ultimate SPS is anticipated with the implementation of regular watering and other good site practices as stipulated in Air Pollution Control (Construction Dust) Regulation. Nevertheless, dust monitoring and regular site environmental audit are still recommended to check the implementation of the regular watering and good site practices.

### 4.2 Mitigation Measures

#### 4.2.1 Construction Phase

**4.2.1.1** During the construction phase, regular watering and other good site practices should be implemented. All the recommended good practices are summarized in the Environmental Mitigation Implementation Schedule (EMIS) in **Appendix 4.1**.

#### 4.2.2 Operational Phase

**4.2.2.1** During operational phase, the EIA Report has recommended odour control measures including enclosure of odour sources, maintaining of negative pressure within the facilities, regular maintenance of deodouriser, for the ultimate SPS. An odour removal efficiency of 95% should be achieved.

### 4.3 Environmental Monitoring and Site Audit Requirements

#### 4.3.1 Construction Phase

##### Air Quality Parameters

**4.3.1.1** As discussed in the EIA Report, while adverse dust impact is not anticipated during the construction phase after the implementation of mitigation measures such as regular watering, dust monitoring is still recommended as a good practice to be conducted throughout the construction period of the ultimate SPS. Monitoring and audit of the Total Suspended Particulate (TSP) levels shall be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

## Monitoring Equipment

**4.3.1.2** One-hour TSP levels shall be measured to indicate the impacts of construction dust on air quality. The 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.

**4.3.1.3** All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any other local atmospheric factors affecting or affected by site conditions, etc., shall be recorded down in detail. A sample data sheet is shown in **Appendix 4.2**.

**4.3.1.4** High volume samplers (HVSs) complying with the following specifications shall be used for carrying out the 1-hour TSP monitoring:

- 0.6 – 1.7 m<sup>3</sup> per minute adjustable flow range;
- Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operations;
- Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- Capable of providing a minimum exposed area of 406cm<sup>2</sup>;
- Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- Equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easily changeable filter; and
- Capable of operating continuously for a 24-hour period.

**4.3.1.5** The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. They shall ensure that sufficient number of HVSs with an appropriate calibration kit is available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs shall be equipped with an electronic mass flow controller and be calibrated against a traceable

standard at regular intervals. All the equipment, calibration kit, filter papers, etc., shall be clearly labelled.

**4.3.1.6** Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter every six months. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The calibration data should be properly documented for future reference by IEC. All the data should be converted into standard temperature and pressure condition.

**4.3.1.7** The flow-rate of the sampler before and after the sampling exercise with the filter in position shall be verified to be constant and be recorded in the data sheet as mentioned in **Appendix 4.2**.

**4.3.1.8** If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, they shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable results to the HVS. The instrument should also be calibrated regularly, and the 1-hour sampling shall be determined periodically by the HVS to check the validity and accuracy of the results measured by direct reading method.

**4.3.1.9** Wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

- The wind sensors should be installed at an elevated level 10m above ground so that they are clear of obstructions or turbulence caused by buildings;
- The wind data should be captured by a data logger, the data recorded in the data logger shall be downloaded periodically for analysis at least once a month;
- The wind data monitoring equipment should be re-calibrated at least once every six months; and
- Wind direction should be divided into 16 sectors of 22.5 degrees each.

**4.3.1.10** If the ET Leader may propose alternative dust monitoring equipment / methodology (e.g. direct reading methods) after the approval of this Manual, agreement from the IEC should be sought. The instrument should also be calibrated regularly following the requirements specified by the equipment manufacturers.

### **Laboratory Measurement / Analysis**

**4.3.1.11** A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory should be



Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited or other internationally accredited laboratory.

**4.3.1.12** If a site laboratory is set up or a non-HOKLAS accredited laboratory is hired for carrying out the laboratory analysis, the laboratory equipment shall be verified by IEC. Measurement performed by the laboratory shall be demonstrated to the satisfaction of the ER, IEC and EPD.

**4.3.1.13** IEC shall conduct regularly audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader shall provide the ER with one copy of the Title 40 of Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his / her reference.

**4.3.1.14** Filter paper of size 8" x 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling.

**4.3.1.15** After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity-controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.

**4.3.1.16** All collected samples shall be kept in a good condition for 6 months before disposal.

#### Monitoring Location

**4.3.1.17** **Figure 4.1** shows the location of the proposed construction dust monitoring station. It is however noted that the Railway EIA has also proposed dust monitoring at the same location. Hence, subject to further agreement, the ER may decide to share the dust monitoring results between SHD Topside Development and Railway EIA. The status and location of dust sensitive receiver may change after issuing this Manual. If such cases exist, the ET shall propose alternative monitoring locations and seek agreement from the IEC and EPD.

**Table 4.1** Construction dust monitoring locations

ID	ASR ID	Location	Impact Monitoring Period
DM-1	A2	Siu Ho Wan Government Maintenance Depot	Duration of construction works for ultimate SPS

**4.3.1.18** When alternative monitoring locations are proposed, the proposed site should, as far as practicable:

- be close to the major site activities which are likely to have air quality impacts;

- be close to ASRs as defined in the EIAO-TM;
- assurance of the minimal disturbance to the occupants and working under a safe condition during monitoring; and
- take into account the prevailing meteorological conditions.

**4.3.1.19** The ET shall agree with IEC on the position of the HVS for the installation of the monitoring equipment. When positioning the samplers, the following points shall be noted:

- a horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- no two samplers should be placed less than 2 meters apart;
- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- a minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20 meters from the dripline;
- any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- a secured supply of electricity is needed to operate the samplers.

**4.3.1.20** The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations shall be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

### **Baseline Monitoring**

**4.3.1.21** Baseline monitoring shall be carried out at all of the designated monitoring location (see **Table 4.1**) for at least two weeks prior to the commissioning of major construction works to obtain ambient 1-hour TSP samples. Ambient one-hour sampling should also be done at least 3 times per day at each monitoring station.

**4.3.1.22** During the baseline monitoring, there should not be any major construction or dust generation activities in the vicinity of the

monitoring station. Before commencing baseline monitoring, the ET shall inform the IEC of the baseline monitoring programme such that, IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.

**4.3.1.23** In case the baseline monitoring cannot be carried out at the designated monitoring location, the ET Leader shall carry out the monitoring at alternative location that can effectively represent the baseline conditions at the impact monitoring location. The alternative baseline monitoring location shall be agreed with the IEC prior to commencement of baseline monitoring.

**4.3.1.24** In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET shall liaise with the IEC and EPD to agree on an appropriate set of data to be used as a baseline reference.

**4.3.1.25** General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources should be also be recorded throughout the baseline monitoring period. If the ET Leader considers that significant changes in the ambient conditions have arisen, a repeat of the baseline monitoring may be carried out to update the baseline levels and air quality criteria, after consultation and agreement with the ER, IEC and EPD.

### **Impact Monitoring**

**4.3.1.26** The ET shall carry out impact monitoring during major construction activities for the ultimate SPS undertaken within a radius of 500m from the monitoring station. For 1-hour TSP monitoring, the sampling frequency of at least 3 times in every 6 days should be undertaken when the highest dust impact occurs.

**4.3.1.27** The monthly schedule of the impact monitoring programme should be drawn up by the ET one month prior to the commencement of the scheduled construction period. Before commencing impact monitoring, the ET shall inform the IEC of the impact monitoring programme such that the IEC can conduct on-site audit.

### **Action and Limit Levels**

**4.3.1.28** The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET shall compare the impact monitoring results with air quality criteria set up for 1-hour TSP. **Table 4.2** shows the air quality criteria, namely Action and Limit Levels to be used.

**Table 4.2** Action and Limit Levels for air quality

Parameters	Action	Limit
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level $\leq 384 \mu\text{g}/\text{m}^3$ , Action level = (baseline level * 1.3 + Limit level)/2; For baseline level $> 384 \mu\text{g}/\text{m}^3$ , Action level = Limit level	$500\mu\text{g}/\text{m}^3$

**4.3.1.29** The Event and Action Plan prescribes procedures and actions associate with the outcome of the comparison of air quality monitoring data recorded and the agreed A/L levels. In the cases where exceedances of these A/L levels occurs, the ET the IEC, the ER and the Contractor should strictly observe the relevant actions of the respective Event and Action Plan listed in **Table 4.3**.



## Event and Action Plan

**4.3.1.30** Should non-compliance of the air quality criteria occur, actions in accordance with the Action Plan in **Table 4.3** shall be carried out.

**Table 4.3** Event and Action Plan for air quality

Event	Action			
	ET	IEC	ER	Contractor
Action level exceedance for one sample	<ol style="list-style-type: none"> <li>1. Repeat measurement to confirm finding;</li> <li>2. If exceedance is confirmed, inform Contractor, IEC and ER;</li> <li>3. Identify source(s), investigate the causes of exceedance and propose remedial measures;</li> <li>4. Increase monitoring frequency.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET, ER and Contractor on possible remedial measures;</li> <li>4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s), investigate the causes of exceedance and propose remedial measures;</li> <li>2. Implement remedial measures;</li> <li>3. Amend working methods agreed with the ER as appropriate.</li> </ol>
Action level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Repeat measurement to confirm finding;</li> <li>2. If exceedance is confirmed, inform Contractor, IEC and ER;</li> <li>3. Identify source(s), investigate the causes of exceedance and propose remedial measures;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Advise the Contractor and ER on the effectiveness of the proposed remedial measures;</li> <li>6. Discuss with IEC and Contractor on remedial actions required;</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET, ER and Contractor on possible remedial measures;</li> <li>4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures;</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. In consultation with the ET and IEC agree with the Contractor on the remedial measures to be implemented;</li> <li>3. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s), investigate the causes of exceedance and propose remedial measures;</li> <li>2. Submit proposals for remedial measures to the ER, ET and IEC within three working days of notification for agreement;</li> <li>3. Implement the agreed proposals;</li> <li>4. Amend proposal if appropriate.</li> </ol>

Event	Action			
	ET	IEC	ER	Contractor
	<p>7. If exceedance continues, arrange meeting with IEC and ER to discuss the remedial measures to be taken;</p> <p>8. If exceedance stops, cease additional monitoring.</p>	<p>5. Supervise Implementation of remedial measures.</p>		
Limit level exceedance for one sample	<p>1. Repeat measurement to confirm finding;</p> <p>2. If exceedance is confirmed, inform IEC, ER, Contractor and EPD;</p> <p>3. Identify source(s), investigate the causes of exceedance and propose remedial measures;</p> <p>4. Increase monitoring frequency to daily;</p> <p>5. Discuss with the ER, IEC and Contractor on the remedial measures and assess effectiveness.</p>	<p>1. Check monitoring data submitted by ET;</p> <p>2. Check Contractor's working method;</p> <p>3. Discuss with ET, ER and Contractor on possible remedial measures;</p> <p>4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures;</p> <p>5. Supervise implementation of remedial measures.</p>	<p>1. Confirm receipt of notification of exceedance in writing;</p> <p>2. Review and agree on the remedial measures proposed by the Contractor;</p> <p>3. Ensure remedial measures properly implemented.</p>	<p>1. Identify source(s), investigate the causes of exceedance and propose remedial measures</p> <p>2. Take immediate action to avoid further exceedance;</p> <p>3. Submit proposals for remedial actions to ER, ET and IEC within three working days of notification for agreement;</p> <p>4. Implement the agreed proposals;</p> <p>5. Amend proposal if appropriate.</p>
Limit level exceedance for two or more consecutive samples	<p>1. Repeat measurement to confirm finding;</p> <p>2. If exceedance is confirmed, inform IEC, ER, Contractor and EPD;</p> <p>3. Identify source(s), investigate the causes of exceedance and propose remedial measures;</p> <p>4. Increase monitoring frequency to daily;</p> <p>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</p> <p>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</p>	<p>1. Check monitoring data submitted by ET</p> <p>2. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</p> <p>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</p>	<p>1. Confirm receipt of notification of exceedance in writing;</p> <p>2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented;</p> <p>4. Supervise the implementation of remedial measures;</p>	<p>1. Identify source(s), investigate the causes of exceedance and propose remedial measures</p> <p>2. Take immediate action to avoid further exceedance;</p> <p>2. Submit proposals for remedial actions to ER, IEC and ET within three working days of notification for agreement;</p>

Event	Action			
	ET	IEC	ER	Contractor
	7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	3. Supervise the implementation of remedial measures.	5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	3. Implement the agreed proposals; 4. Review and resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

## Notes:

ET – Environmental Team

IEC – Independent Environmental Checker

ER – Engineer's Representative

## 4.3.2 Operational Phase

4.3.2.1 With the implementation of mitigation measures as stated in the EMIS (Appendix 4.1), operational phase impact is not anticipated. Hence monitoring and audit requirements are not required.



## 5 Noise

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### 5.1 Introduction

**5.1.1.1** The EIA Report has considered the potential noise impacts during both the construction and operational phases of the ultimate SPS.

**5.1.1.2** Based on the assessment results, adverse impact from the ultimate SPS is not anticipated with the implementation of the proposed noise mitigation measures.

### 5.2 Mitigation Measures

#### 5.2.1 Construction Phase

**5.2.1.1** The EIA Report has recommended construction noise mitigation measures including use of quiet plant and temporary noise barriers, etc. All the proposed mitigation measures are summarized in the EMIS in **Appendix 4.1**.

#### 5.2.2 Operational Phase

##### **Fixed Noise**

**5.2.2.1** For the proposed noise sources, such as louvers, which are located near to existing and planned Noise Sensitive Receivers (NSRs), the following noise mitigation measures shall be considered:

- All the pumps should be enclosed inside building structures;
- Proper selection of quiet plant aiming to reduce the tonality at NSRs;
- Installation of silencer / acoustic enclosure / acoustic louver for the exhaust of ventilation system;
- Openings of ventilation systems should be located away from NSRs as far as practicable.

### 5.3 Environmental Monitoring and Site Audit Requirements

#### 5.3.1 Construction Phase

**5.3.1.1** Given adverse construction noise impacts are not anticipated and the construction of the ultimate SPS will be completed before the population intake of the proposed development, noise monitoring for construction noise is not necessary during the construction phase. However, regular audits and site inspections at least once per week

should be carried out during construction phase by the ET to ensure that the mitigation measures recommended in the EIA Report and EMIS in **Appendix 4.1** are properly implemented by the Contractor.

## 5.3.2 Operational Phase

**5.3.2.1** The Contractor should carry out a fixed noise commissioning test for planned fixed noise at the ultimate SPS before its operation. The test should be carried out by a qualified person possessing at least 7 years of noise control experience and a corporate membership of Hong Kong Institute of Acoustic or equivalent. The Contractor should implement all necessary measures to ensure compliances with the noise standards stipulated in the NCO for fixed plant operations.

## 6 Water Quality

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### 6.1 Introduction

**6.1.1.1** The EIA Report has assessed the water quality impacts associated with the ultimate SPS. According to the current design, the construction works would be land-based and there would not be any marine works. Good site practices in accordance to Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94) would be implemented and proper temporary sanitary facilities (e.g. portable chemical toilet) would be provided to properly collect the on-site sewage generated from the construction workers. Various mitigation measures are proposed. With proper implementation of those mitigation measures, it is anticipated that there would be no residual adverse water quality impact.

### 6.2 Mitigation Measures

#### 6.2.1 Construction Phase

**6.2.1.1** The EIA Report has recommended mitigation measures including good site practices to control construction site runoff. All the mitigation measures are summarised in EMIS in **Appendix 4.1**. These mitigation measures also include practices to handle sewage from workforce such as provision of portable chemical toilets.

#### 6.2.2 Operational Phase

**6.2.2.1** During the operation phase, recommended provisions are suggested for the ultimate SPS to minimize the chance of emergency discharge. The recommended provisions including 100% standby pumping capacity, twin rising mains, emergency storage facilities up to 3-hour ADWF capacity, are listed in EMIS in **Appendix 4.1**.

### 6.3 Environmental Monitoring and Site Audit Requirements

#### 6.3.1 Construction Phase

**6.3.1.1** Due to absence of anticipated adverse impacts on water quality, environmental monitoring of water quality is not recommended during construction phase. Regular audits and site inspections at least once per week should be carried out during construction phase by the ET to ensure that the mitigation measures recommended in the EIA Report and EMIS in **Appendix 4.1** are properly implemented by the Contractor.

**6.3.1.2** A compliance audit for effluent discharge against valid discharge license should be carried out through scheduled on-site measurement in accordance with the monitoring frequency and parameter stipulated in the Water Pollution Control Ordinance (WPCO).

**6.3.1.3** As the details in **Appendix 4.1** shows, the mitigation measures during construction phase include the practices which can reduce the potential water impact due to construction site runoff in accordance to Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94).

**6.3.1.4** During the construction phase, the impacts of sewage from workforce should be mitigated by provision of portable chemical toilets and posting of notices to remind workers not to discharge any sewage or wastewater into the nearby environment.

## **6.3.2 Operational Phase**

**6.3.2.1** With the implementation of additional provision and enhancement of sewage pumping stations as stated in the EMIS (**Appendix 4.1**), operational phase impact is not anticipated. Hence, monitoring and audit requirements are not required. The additional provisions and enhancement of sewage pumping stations include standby pumping capacity, dual-feed power supply for each SPS, provision of emergency storage tank, monitoring and control system 24-7 emergency repair service in case of emergency situation and regular inspection by qualified personnel are detailed in **Appendix 4.1**.

## 7 Sewerage and Sewage Treatment Implications

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### 7.1 Introduction

**7.1.1.1** An assessment of potential impacts due to sewage arising from the ultimate SPS, is assessed in **Section 6** of the EIA Report. The EIA Report reviews the existing and planned sewerage network. With the planned sewerage network connecting to the existing Siu Ho Wan Sewage Treatment Plant, it is anticipated that there would be no adverse impacts due to sewage arising from the proposed Project.

### 7.2 Mitigation Measures

#### 7.2.1 Operational Phase

**7.2.1.1** Due to the ecological consideration of The Brothers Marine Park in The Brothers (islands), the provision of twin rising mains, adoption of high density polyethylene (HDPE) or ductile iron pipe and mitigation measures to minimize the chances of emergency discharge are proposed to enhance the sewerage network reliability and minimise environmental impacts due to system failure or in case of emergency situations during the operation phase. Chances of emergency discharge would be minimised with the implementation of following mitigation measures:

- 100% standby pumping capacity within ultimate SPS, with spare pump up to 50% pumping capacity stockpiled for any emergency use. The standby pump will be automatically take off the failed duty pump;
- dual-feed power supply;
- emergency storage tank providing up to 3-hours ADWF capacity at the ultimate SPS. This emergency storage will be provided adjacent to the wet well chamber. The inlet of the emergency storage will be at the same level as the invert level of incoming pipe of wet well chamber. It is noted that this emergency storage will be provided at the ultimate SPS located at ground level of the eastern end of the proposed development and will consider all sewage flow from the development;
- Monitoring and Control System (MACS) providing real-time notification of alert signal in emergency situation;
- Project Proponent's term contractor to provide 24-7 emergency repair service in case of emergency situation; and
- Qualified personnel appointed by Project Proponent carrying out regular inspection, routine maintenance and repairing of the facilities and equipment.

**7.2.1.2** The details of these measures are described in EMIS in **Appendix 4.1**.

## **7.3 Environmental Monitoring and Site Audit Requirements**

### **7.3.1 Operational Phase**

**7.3.1.1** With the implementation of mitigation measures as stated in the EMIS (**Appendix 4.1**), operational phase impact is not anticipated. Hence, monitoring and audit requirements are not required.



## 8 Waste Management

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### 8.1 Introduction

**8.1.1.1** The quantity and timing for the generation of waste during the construction phase have been estimated. Measures including the opportunity for on-site sorting, reusing excavated materials etc., are devised in the construction methodology to minimise the surplus materials to be disposed off-site. Proper disposal of chemical waste should be via a licensed waste collector.

### 8.2 Mitigation Measures

#### 8.2.1 Construction Phase

**8.2.1.1** All the proposed mitigation measures during construction phase are stipulated in the EIA Report and summarised in the EMIS in **Appendix 4.1**.

**8.2.1.2** Waste will be handled in accordance with relevant legislation and guidelines and with the implementation of the proposed mitigation measures, no adverse environmental impacts from waste management are anticipated. EM&A requirements are required for waste management during the construction phase only and the effective management of waste arising during the construction phase will be monitored through the site audit programme. The aims of the waste audit are:

- To ensure the waste arising from the works are handled, stored, collected, transferred and disposed of in an environmentally acceptable manner; and
- To encourage the reuse and recycling of material.

**8.2.1.3** A trip-ticket system should be operated to monitor all movements of C&D materials and chemical wastes which will be collected by a licensed collector to a licensed facility for final treatment and disposal. Recommendations have been made to ensure proper treatment and proper disposal of these wastes in the EIA Report and summarised in the EMIS in **Appendix 4.1**.

**8.2.1.4** All dump trucks engaged on site should be equipped with GPS or equivalent system for tracking and monitoring of their travel routings and parking locations to prohibit illegal dumping and landfilling of C&D materials. Record and analysis of data collected by the mentioned GPS or equivalent system should be kept.

#### 8.2.2 Operational Phase

**8.2.2.1** The types and quantities of waste that would be generated during the operational phase have been assessed. General refuse generated from

the ultimate SPS should be collected with lidded bins and at least daily collection should be arranged by the waste collector as stated in the EIA Report and EMIS. If any chemical waste is to be generated from the operation of the ultimate SPS, the operator shall register as a Chemical Waste Producer with EPD and manage the chemical waste in accordance with Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C). With proper management, it is anticipated there would not be any insurmountable impacts during the operational phase.

## 8.3 Environmental Monitoring and Site Audit Requirements

### 8.3.1 Construction Phase

**8.3.1.1** The Contractor shall be required to pay attention to the environmental standard and guidelines and carry out appropriate waste management and obtain the relevant license / permits for waste disposal. The ET shall ensure that the Contractor has obtained from the appropriate authorities the necessary waste disposal permits or licenses including:

- Chemical Waste Producer Registration;
- Public Dumping License under the Land (Miscellaneous Provisions) Ordinance (Cap 28);
- Effluent Discharge License under the Water Pollution Control Ordinance.

**8.3.1.2** The Contractor shall refer to the relevant booklets issued by the DEP when applying for the license/permit and the ET shall refer to these booklets for auditing purposes.

**8.3.1.3** Regular audits and site inspections should be carried out during construction phase by the ET to ensure that the recommended good site practices and other mitigation measures recommended in the EIA Report and EMIS in **Appendix 4.1** are properly implemented by the Contractor. The audits should concern all aspects of on-site waste management practices including waste generation, storage, recycling, transport and disposal. Apart from site inspection, documents including licenses, permits, disposal and recycling records should be reviewed and audited for compliance with the legislation and contract requirements.

**8.3.1.4** The requirements of the environmental audit programme are set out in **Section 14** of this Manual. The audit programme will verify the implementation status and evaluate the effectiveness of the mitigation measures.

## 8.3.2 Operational Phase

**8.3.2.1** As it is anticipated that there would not be any insurmountable impacts during the operational phase, monitoring and audit requirements are not required.

## 9 Land Contamination

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### 9.1 Introduction

- 9.1.1.1** The EIA Report has assessed the land contamination associated within the areas of the ultimate SPS. Potential land contamination is not anticipated for the ultimate SPS.

### 9.2 Mitigation Measures

- 9.2.1.1** As potential land contamination is not anticipated for the ultimate SPS, monitoring and audit requirements are not required.

#### 9.2.2 Construction Phase

- 9.2.2.1** No mitigation measures are required for construction phase.

#### 9.2.3 Operational Phase

- 9.2.3.1** No mitigation measures are required for operational phase.

### 9.3 Environmental Monitoring and Site Audit Requirements

- 9.3.1.1** As no land contamination issue is anticipated for the ultimate SPS, no environmental monitoring and site auditing on land contamination related works is required.

#### 9.3.2 Construction Phase

- 9.3.2.1** Environmental monitoring and site audit are not required for construction phase.

#### 9.3.3 Operational Phase

- 9.3.3.1** Environmental monitoring and site audit are not required for operational phase.

## 10 Ecology

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### 10.1 Introduction

**10.1.1.1** Based on the EIA, no ecological mitigation measures apart from general good site practices are considered necessary for this project as impacts identified during both construction and operation phases are considered either ‘minor’ or ‘insignificant’.

### 10.2 Mitigation Measures

**10.2.1.1** The proposed mitigation measures for ecological impacts are summarised in the Environmental Mitigation Implementation Schedule (EMIS) in **Appendix 4.1**.

#### 10.2.2 Construction Phase

**10.2.2.1** Good site practices are required to minimise the potential indirect impact. Regular audits and site inspections should be carried out to ensure that no unacceptable ecological impact on the conservation important sites/ species is resulted by the noise, dust, site run-off, and other pollutions from the construction sites and ensure that the mitigation measures recommended in the EIA Report and this EM&A Manual are properly implemented by the Contractor.

#### 10.2.3 Operational Phase

**10.2.3.1** During operational phase, the chance of emergency discharge from the ultimate SPS should be minimised by the provision of adequate emergency facilities, including standby pumping capacity, spare pump, dual-feed power supply, emergency storage tank providing up to 3-hours ADWF capacity and Monitoring and Control System (MACS) providing real-time notification of alert signal in emergency situation.

## 10.3 Environmental Monitoring and Site Audit Requirements

### 10.3.1 Construction Phase

**10.3.1.1** Site inspections during construction phase shall be carried out to monitor the potential for occurrence of unforeseen impacts during the construction process. Site audits shall be undertaken during the construction phase of the ultimate SPS to check that the proposed ecological mitigation measures recommended in the EIA Report and EMIS in **Appendix 4.1** are properly implemented and maintained as per their intended objectives. Site inspections shall be undertaken by the ET at least once per week during the routine environmental audit as detailed in **Section 14**.

## 10.3.2 Operational Phase

**10.3.2.1** As there is no anticipated adverse impact during operation phase, monitoring and audit requirements are not required.



## 11 Fisheries

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### 11.1 Introduction

**11.1.1.1** The EIA has evaluated the implications on fisheries resources and recommended water quality mitigation measures to avoid and minimise the impact arising from the ultimate SPS.

### 11.2 Mitigation Measures

**11.2.1.1** No fisheries specific mitigation measures and monitoring would be required and mitigation measures recommended in the water quality impacts will also minimize any adverse impacts on fisheries (**Appendix 4.1**).

#### 11.2.2 Construction Phase

**11.2.2.1** Though fisheries impact is unlikely, precautionary practices to prevent fisheries impacts due to the deterioration of marine water quality should be implemented. Good site practices as listed in the water quality section of the EMIS in **Appendix 4.1** should be maintained to mitigate the surface runoff generate from the construction works.

#### 11.2.3 Operational Phase

**11.2.3.1** During operational phase, the chance of emergency discharge from the ultimate SPS should be minimised by the provision of adequate emergency facilities, including standby pumping capacity, spare pump, dual-feed power supply, emergency storage tank providing up to 3-hours ADWF capacity and Monitoring and Control System (MACS) providing real-time notification of alert signal in emergency situation.

### 11.3 Environmental Monitoring and Site Audit Requirements

#### 11.3.1 Construction Phase

**11.3.1.1** Site inspections during construction phase shall be carried out to monitor any malpractice leading to deterioration of water quality of the surrounding which may in turn affect the fisheries resources. Site inspections shall be undertaken by the ET at least once per week during the routine environmental audit as detailed in **Section 14**.

#### 11.3.2 Operational Phase

**11.3.2.1** As there is no anticipated adverse impact during operation phase, monitoring and audit requirements are not required.

## 12 Landscape and Visual

### 12.1 Introduction

**12.1.1.1** The EIA has recommended EM&A for landscape and visual resources to be undertaken during the design, construction and operational stages of the ultimate SPS. The design, implementation and maintenance of landscape mitigation measures is a key aspect of this and should be checked to ensure that they are fully realised and that potential conflicts between the proposed landscape measures and any other project works and operational requirements are resolved at the earliest possible date. In addition, implementation of the mitigation measures recommended by the EIA will be monitored through the site audit programme.

### 12.2 Mitigation Measures

**12.2.1.1** The Landscape and Visual Assessment of the EIA proposes a number of mitigation measures to ameliorate the landscape and visual impacts of the ultimate SPS. These measures include, but are not limited to the following and implementation is summarised in the EMIS in **Appendix 4.1**.

**Table 12.1** Mitigation measures for construction and operational phase

Mitigation Measure Code	Summary Description	Mitigate Landscape Impacts	Mitigate Visual Impacts
<i>Construction Phase</i>			
CM1	Optimization of Construction Areas	✓	✓
CM2	Transplanting of Affected Trees	✓	
CM3	Screen Hoarding		✓
CM4	Construction Lighting Control		✓
CM6	Tree Preservation	✓	
<i>Operational Phase</i>			
OM1	Re-instatement of Excavated Area	✓	✓
OM4	Compensatory Planting	✓	

#### 12.2.2 Construction Phase

**12.2.2.1** The landscape and visual mitigation measures proposed should be incorporated in the landscape and engineering design. Mitigation measures to be implemented during construction should be adopted from the start of construction and be in place throughout the entire construction period.

### 12.2.3 Operational Phase

**12.2.3.1** Mitigation measures to be implemented during operation should be integrated into the detailed design and built as part of the construction works so that they are in place on commissioning of the ultimate SPS.

## 12.3 Environmental Monitoring and Site Audit Requirements

### 12.3.1 Construction Phase

**12.3.1.1** Site audits should be undertaken during the construction phase of the Project to check that the proposed landscape and visual mitigation measures recommended in the EIA Report and EMIS in **Appendix 4.1** are properly implemented and maintained as per their intended objectives. Site inspections should be undertaken by the ET at least once every two weeks during the construction period.

### 12.3.2 Operational Phase

**12.3.2.1** As there is no anticipated adverse impact during operation phase, monitoring and audit requirements are not required.

## 13 Hazard to Life

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### 13.1 Introduction

**13.1.1.1** The EIA Report has assessed the hazard to life impact due to the presence of hazardous facilities nearby (i.e. Siu Ho Wan Water Treatment Works). Societal risk and individual risk impacts of those hazardous facilities have been demonstrated in the EIA Report.

### 13.2 Mitigation Measures

**13.2.1.1** The societal risk contribution from the Project is not significant. Investigation of potential mitigation measures options are subject to the cost benefit analysis evaluation. The results indicate that no mitigation measures options are cost effective. Hence, mitigation measures are not recommended for incorporation.

#### 13.2.2 Construction Phase

**13.2.2.1** Mitigation measures are not recommended for construction phase.

#### 13.2.3 Operational Phase

**13.2.3.1** Mitigation measures are not recommended for construction phase.

## 13.3 Environmental Monitoring and Site Audit Requirements

### 13.3.1 Construction Phase

**13.3.1.1** The societal risk contribution from the SPS is not significant during construction phase. However, emergency planning, training and drill for construction workers under chlorine release scenario from SHWWTW will be provided during construction phase as precautionary measures.

### 13.3.2 Operational Phase

**13.3.2.1** The societal risk contribution from the SPS is not significant during operational phase. Monitoring and audit requirements are not required for operational phase.

## 14 Site Environmental Audit

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### 14.1 Site Inspection

**14.1.1.1** Site inspection provides a direct means to initiate and enforce specified environmental protection and pollution control measures. These shall be undertaken routinely to inspect construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Site inspection is one of the most effective tools to enforce the environmental protection requirements at the works area.

**14.1.1.2** The ET shall be responsible for formulating the environmental site inspection programme as well as the deficiency and action reporting system, and for carrying out the site inspections. The proposal for rectification, if any, should be prepared and submitted to the ET Leader and IEC by the Contractor.

**14.1.1.3** Regular site inspections shall be carried out and led by the ER and attended by the Contractor and ET at least once per week during the construction phase. The areas of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site. It should also review the environmental conditions of locations outside the works area which is likely to be affected, directly or indirectly, by the construction site activities of the ultimate SPS. The ET shall make reference to the following information in conducting the inspection. During the inspection, the following information should be referred to:

- (i) EIA Report and EM&A recommendations on environmental protection and pollution control mitigation measures;
- (ii) ongoing results of the EM&A programme;
- (iii) works progress and programme;
- (iv) individual works methodology proposals (which shall include the proposal on associated pollution control measures);
- (v) contract specifications on environmental protection;
- (vi) relevant environmental protection and pollution control legislations; and
- (vii) previous site inspection results undertaken by the ET and others.

**14.1.1.4** The Contractor shall keep the ER and ET Leader updated with all relevant environmental related information on the construction contract necessary for him to carry out the site inspections. Site inspection results and associated recommendations for improvements to the environmental protection and pollution control efforts should be recorded and followed up by the Contractor in an agreed time-frame. The Contractor shall follow the procedures and time-frame as stipulated

in the environmental site inspection, and the deficiency and action reporting system formulated by the ET, to report on any remedial measures subsequent to the site inspections.

**14.1.1.5** The ER, ET and the Contractor should also carry out ad-hoc site inspections if significant environmental problems are identified. Inspections may also be required subsequent to receipt of a valid environmental complaint, or as part of the investigation work.

## **14.2 Environmental Compliance**

**14.2.1.1** There are statutory requirements on environmental protection and pollution control requirements with which construction activities must comply.

**14.2.1.2** In order to ensure the works comply with statutory requirements, all method statements of works should be submitted by the Contractor to the ER for approval and to the ET Leader for vetting to ensure sufficient environmental protection and pollution control measures have been included. The Environmental Mitigation Implementation schedule (EMIS) is summarised in **Appendix 4.1**. Any proposed changes to the mitigation measures shall be certified by the ET Leader and verified by the IEC as conforming to the relevant information and recommendations contained in the EIA Report.

**14.2.1.3** The ER and ET shall also review the progress and programme of the works to check that relevant environmental legislations have not been violated, and that any foreseeable potential for violating laws can be prevented.

**14.2.1.4** The Contractor should provide the update of the relevant documents to the ET Leader so that checking can be carried out. The document shall at least include the updated Works Progress Reports, updated Works Programme, method statements, any application letters for different licences / permits under the environmental protection laws, and copies of all valid licences / permits. The site diary and environmental records shall also be available for inspection by the relevant parties.

**14.2.1.5** After reviewing the document, the ET shall advise the IEC and Contractor of any non-compliance with legislative requirements on environmental protection and pollution control so that they can timely take follow-up actions as appropriate. If the follow-up actions may still result in potential violation of environmental protection and pollution control requirements, the ER and ET should provide further advice to the Contractor to take remedial action to resolve the problem.

**14.2.1.6** Upon receipt of the advice, the Contractor shall undertake immediate actions to correct the situation. The ER and ET shall follow up to ensure that appropriate action has been taken in order to satisfy legal requirements.



## 14.3 Choice of Construction Method

**14.3.1.1** At times during the construction phase the Contractor may submit method statements for various aspects of construction. This state of affairs would only apply to those construction methods that the EIA has not imposed conditions while for construction methods that have been assessed in the EIA, the Contractor is bound to follow the requirements and recommendations in the EIA study. The Contractor's options for alternative construction methods may introduce adverse environmental impacts into the Project. It is the responsibility of the Contractor and ET, in accordance with established standards, guidelines and EIA study recommendations and requirements, to review and determine the adequacy of the environmental protection and pollution control measures in the Contractor's proposal in order to ensure no unacceptable impacts would result. To achieve this end, the ET shall provide a copy of the Proactive Environmental Protection Proforma as shown in **Appendix 14.1** to the IEC for approval before commencement of work. The IEC should audit the review of the construction method and endorse the proposal on the basis of no adverse environmental impacts.

**14.3.1.2** In case the Contractor needs to update the mitigation measures and/or the project implementation schedule as a result of alternative construction method(s) or other condition (e.g. site constraint(s)), the ET shall also review the latest recommendation of mitigation measures and/or project implementation schedule by submission of a Proactive Environmental Protection Proforma as shown in **Appendix 14.1**. The IEC should verify the Proforma and conduct audit to confirm proper implementation of the alternative measures.

## 14.4 Environment Complaints

**14.4.1.1** The following procedures should be undertaken upon receipt of any environmental complaint:

- The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET and IEC immediately;
- The Contractor to investigate, with the ER and ET, the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency and stations, if necessary;
- The Contractor to identify remedial measures in consultation with the IEC, ET and ER if a complaint is valid and due to the construction works of the Project;
- The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring

frequency and stations, where necessary, for checking the effectiveness of the remedial measures;

- The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- The ET/Contractor to undertake monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
- The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and monitoring results in the monthly auditing reports.

## 15 Reporting

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### 15.1 General

**15.1.1.1** Reports can be provided in an electronic medium upon agreeing the format with the ER and EPD. This would enable a transition from a paper / historic and reactive approach to an electronic / real time proactive approach. All the monitoring data shall also be submitted in an approved electronic medium. The formats for monitoring data to be submitted shall be separately agreed.

**15.1.1.2** Types of reports that the ET shall prepare and submit include monthly auditing report and final auditing review report. In accordance with Annex 21 of the EIAO-TM, a copy of the monthly and final auditing reports shall be made available to the Director of Environmental Protection.

### 15.2 Monthly Auditing Report

**15.2.1.1** The results and findings of all EM&A work required in the Manual shall be recorded in the monthly auditing reports prepared by the ET and endorsed by the IEC. The auditing report shall be prepared and submitted to EPD within 10 working days of the end of each reporting month, with the first report within the month after major construction works commences. Copies of each monthly auditing report shall be submitted to the following parties: the IEC, the ER and EPD. Before submission of the first auditing report, the ET shall liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.

#### **First Monthly Auditing Report**

**15.2.1.2** The first monthly auditing report shall include at least the following:

- (i) Executive summary (1-2 pages):
  - notifications of any summons and successful prosecutions;
  - reporting changes; and
  - future key issues.
- (ii) Basic project information:
  - project organisation including key personnel contact names and telephone numbers;
  - construction programme;
  - management structure; and
  - works undertaken during the month.

- (iii) Environmental status:
- advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
  - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
  - drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring stations.
- (iv) A brief summary of auditing requirements including:
- environmental mitigation measures, as recommended in the EIA Report; and
  - environmental requirements in contract documents.
- (v) Implementation status
- advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report.
- (vi) Report on complaints, and notifications of summons and successful prosecutions:
- record of all complaints received, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary; and
  - review of the reasons for and the implications of complaints, summons and prosecutions including review of pollution sources and working procedures.
- (vii) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
  - advice on the solid and liquid waste management status;
  - record of any project changes from the originally proposed as described in the EIA Report (e.g. construction methods, mitigation proposals, design changes, etc.); and

- comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the audit programme) and conclusions.

### **Subsequent Monthly Auditing Report**

#### **15.2.1.3** Subsequent monthly auditing reports shall include at least the following:

- (i) Executive summary (1-2 pages):
  - notifications of any summons and successful prosecutions;
  - reporting changes; and
  - future key issues.
- (ii) Basic project information:
  - project organisation including key personnel contact names and telephone numbers;
  - construction programme;
  - management structure; and
  - works undertaken during the month; and
  - any updates as needed to the scope of works and construction methodologies.
- (iii) Environmental status:
  - advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
  - works undertaken during the month with illustrations (such as location of works, etc.); and
  - drawings showing the Project area, any environmental sensitive receivers and the locations of the monitoring stations.
- (iv) Implementation status
  - advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report.
- (v) Report on complaints, and notifications of summons and successful prosecutions:
  - record of all complaints received, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;

- record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
  - review of the reasons for and the implications of complaints, summons and prosecutions including review of pollution sources and working procedures; and
- (vi) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
  - advice on the solid and liquid waste management status;
  - record of any project changes from the originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc.); and
  - comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the audit programme) and conclusions.
- (vii) Appendices
- auditing schedule for the present and next reporting period;
  - cumulative statistics on notifications of summons and successful prosecutions; and
  - outstanding issues and deficiencies.

**15.2.1.4** Upon completion of the ultimate SPS, Contractor should conduct the fixed noise commissioning test for the ultimate SPS and ET should incorporate the results of the test into the subsequent monthly auditing report.

## **15.3 Final Auditing Review Report**

**15.3.1.1** The audit programme should be terminated upon the completion of the construction activities that have the potential to result in significant environmental impacts.

**15.3.1.2** Prior to the proposed termination, it may be advisable to consult relevant local communities. The proposed termination should only be implemented after the proposal has been endorsed by the IEC, the ER and the Project Proponent followed by approval from the Director of Environmental Protection.

**15.3.1.3** The final auditing report should contain at least the following information:

- (i) Executive summary (1-2 pages):



- (ii) Drawings showing the Project Area, any environmental sensitive receivers and locations of commissioning test;
- (iii) Basic project information including a synopsis of the project organisation, contacts of key management, and a synopsis of work undertaken during the course of the project or past twelve months;
- (iv) A brief summary of audit requirements including:
  - environmental mitigation measure, as recommended in the project EIA Report; and
  - environmental impact hypotheses tested.
- (v) A summary of the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report, summarised in the updated implementation schedule;
- (vi) A summary record of all complaints received, liaison and consultation undertaken, actions and follow-up actions taken and results;
- (vii) A summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection / pollution control legislation, locations and nature of the breaches, investigation follow-up actions taken and results;
- (viii) A review of the validity of EIA predictions and identification of shortcomings in EIA recommendations;
- (ix) Comments (for examples, a review of the effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, that is, of the overall audit programme); and
- (x) Recommendations and conclusions (for example, a review of success of the overall audit programme to cost-effectively identify deterioration and to initiate prompt effective mitigatory action when necessary).

## 15.4 Data Keeping

**15.4.1.1** No site-based documents (such as site inspection forms, etc.) are required to be included in the monthly auditing reports. However, any such document shall be well kept by the ET and be ready for inspection upon request. All relevant information shall be clearly and systematically recorded in the document. Data format shall be agreed with EPD. All documents and data shall be kept for at least one year following completion of the construction contract.

## Figures

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## Appendix 3.1

### Project Organisation for Environmental Works

## Appendix 4.1

### Environmental Mitigation Implementation Schedule (EMIS)

## Appendix 14.1

### Proactive Environmental Protection Proforma