



## Section 9

# ENVIRONMENTAL MANAGEMENT PLAN

### 9.1 INTRODUCTION

This section describes the environmental management framework that will be established to address, communicate and manage the environmental concerns during construction of the ECRL Phase 2 project. Taking into account the size of the Project, a comprehensive environmental management system is required.

This section of the report describes:

- **Organizational structure** which identifies the key parties and their roles and responsibilities.
- **Pollution Prevention & Mitigating Measures (P2M2) during construction** where the division of the construction packages and related P2M2 are explained.
- **Environmental reporting** which will indicate the types of reporting required for submission to the relevant authorities.
- **Lines of communication** which will determine the various levels of communication at different stages and whether it is external or internal communication.
- **Environmental monitoring** which describes the types of monitoring required including performance monitoring, compliance monitoring and impact monitoring to ensure compliance and effectiveness of the mitigating measures.
- **Environmental auditing** which will describe the frequency and nature of third-party environmental auditing that will be required for the Project.
- **Emergency Response Plan** which will identify the responses required to various emergencies that could potentially occur at the Project site.

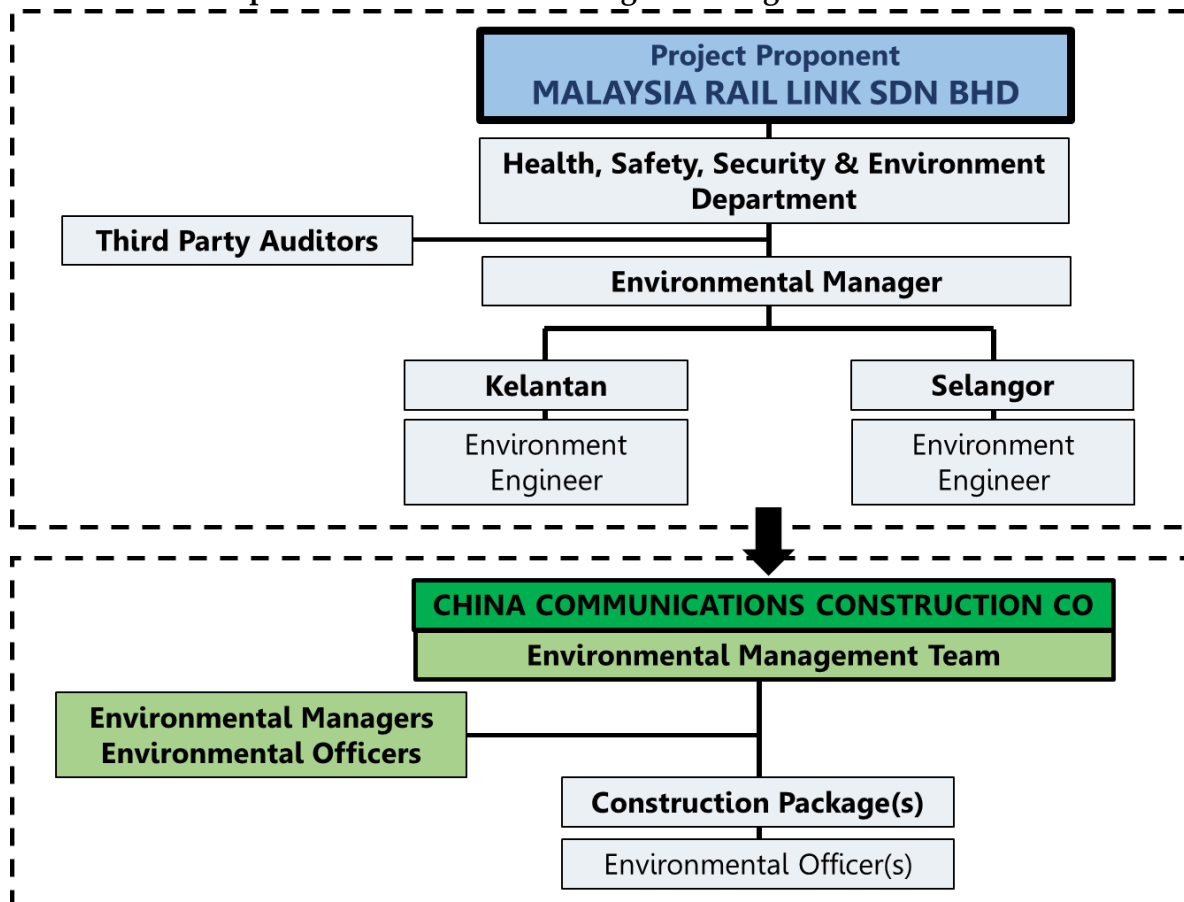
- **Environmental mainstreaming** which spells out the Project Proponent's commitment to support mainstreaming, self-regulation and environmental protection.

## 9.2 ORGANIZATION STRUCTURE

### 9.2.1 Key Parties

The key entity in this entire environmental management is Malaysia Rail Link Sdn Bhd (MRL), the Project Proponent which is ultimately responsible for the environmental performance and compliance of the Project. The other parties with responsibilities for environmental management and compliance include the EPCC contractor, sub-package contractors, environmental consultants and environmental officers. Clear definition of roles and responsibilities of all parties involved is critical for a Project of this size and nature. The organizational structure is shown in **Chart 9-1** while the roles and responsibilities of all parties involved are summarized in **Table 9-1**. The roles and responsibilities will be further expanded in the Environmental Management Plan (EMP) for each work package.

**Chart 9-1: Proposed Environmental Management Organizational Structure**



**Table 9-1 : Roles and Responsibilities during Project Construction**

<b>Roles</b>	<b>Responsibilities</b>
<b>Project Proponent: Malaysia Rail Link Sdn Bhd (MRL)</b>	<ul style="list-style-type: none"> <li>• To comply with EIA approval conditions and other relevant environmental requirements</li> <li>• To monitor environmental compliance by CCCC as per contractual requirements</li> <li>• To ensure that relevant actions are taken to address any complaints during construction stage</li> <li>• To submit relevant environmental reports to DOE as required</li> </ul>
<b>EPCC Contractor: China Communications Construction Company (M) Sdn Bhd</b>	<ul style="list-style-type: none"> <li>• To comply with EIA approval conditions and other relevant environmental requirements</li> <li>• To brief all contractors, sub-contractors and consultants about environmental requirements</li> <li>• To monitor and ensure implementation of pollution prevention and mitigating measures (P2M2) by all contractors during construction stage</li> <li>• To prepare and submit relevant environmental reports to MRL</li> <li>• To ensure that relevant actions are taken to address any complaints during construction stage</li> </ul>
Construction Package Sub- Contractor	<ul style="list-style-type: none"> <li>• To implement pollution prevention and mitigating measures (P2M2) during construction stage</li> <li>• To ensure compliance to environmental requirements at all time</li> </ul>
Environmental Consultant • To be appointed	<ul style="list-style-type: none"> <li>• Provide technical expertise in the formulation of the EMP, P2M2 and in the preparation of Environmental Performance Monitoring Document</li> <li>• Advise Project Proponent and EPCC Contractor on P2M2 and compliance requirements</li> </ul>
Environmental Officer	<ul style="list-style-type: none"> <li>• Implement the EMP and install the temporary and permanent P2M2</li> <li>• Prepare Environmental Performance Monitoring Document (EPMD) which will describe compliance and performance of the P2M2</li> <li>• Supervise or oversee the Performance Monitoring programme as specified in the EPMD</li> <li>• Prepare Performance Monitoring Report (PMR) which will evaluate the overall performance of the P2M2 and proposed recommendations to minimize the impacts</li> <li>• Communicate the status of environmental compliance to MRL and CCCC.</li> <li>• Submit report on maintenance of ESCP control measures to JPS state on a monthly basis.</li> <li>• Maintain records of any incidences or accidents and all relevant documents during the construction stage</li> </ul>

### 9.2.2 Health, Safety, Security and Environmental Department

MRL will establish its Health, Safety, Security and Environmental Department (HSSE) to ensure compliance to all relevant environmental requirements and its main responsibilities include the following:

- Formulate an Environmental Policy which will be communicated to all parties involved in the Project, including external stakeholders
- Establish an **Environmental Performance Monitoring Committee** (EPMC) which will monitor the environmental performance of MRL as well as the EPCC Contractor (see Section 9.8.3)
- Supervise the EPCC Contractor to ensure compliance to all environmental requirements
- Engage with relevant authorities or technical agencies on environmental related matters

The EPCC Contractor will establish an Environmental Management Team to ensure environmental compliance during the construction stage.

As part of the overall environmental organization structure, environmental consultants and environmental officers will be appointed for each package to ensure environmental aspects are taken into consideration and pollution prevention and mitigation measures (P2M2) are implemented during the construction stage.

### 9.3 P2M2 DURING CONSTRUCTION

Given the locality of the two extensions for ECRL Phase 2, environmental management will be carried out based on sub-packages. At the current stage, the Environmental Management Plan is proposed to be divided into two packages (Table 9-2).

**Table 9-2 : EMP Packages**

State	EMP Package	Length (km)	Environmental Consultant
Kelantan	Kota Bharu to Pengkalan Kubor	23.2	To be appointed
Selangor	Gombak North to Port Klang	79.5	

The EMP will be prepared and submitted to the respective DOE State offices for approval. Construction works for each package will commence only after EMP approval is obtained. The EMP will adhere to the requirements stated in “Chapter 6 – Post Submission Stage of EIA Report, Environmental Impact Assessment Guideline in Malaysia 2016”.

Each package will have a detailed LD-P2M2 document as part of the EMP. The LD-P2M2 document will comply with the requirements and specifications stipulated in the “Guidance Document for the Preparation of the Document on Land Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2)”. The focus of the LD-P2M2 is on the prevention, mitigation and control of discharges from land disturbing activities or construction activities. The LD-P2M2 for EMP will be prepared based on more detailed information which will be available during that stage, as well as the conditions stated in the EIA Conditions of Approval (COA). The document will be prepared by a DOE Registered Consultant who is a Certified Professional in Erosion and Sediment Control (CPESC).

The main focus of the two EMPs will be based on the impacts and mitigation measures identified in Section 7 and 8 of this EIA report (Table 9-3).

**Table 9-3 : Focus of the P2M2**

EMP Package	Key issues
EMP 1 Kelantan	Soil erosion and sediment control from embankment construction, borrow areas, demolition waste, protection of irrigation infrastructure, protection of water courses, dust control
EMP 2 Selangor	Biomass disposal, soil erosion and sediment control from embankment construction and hill cutting, borrow areas, demolition waste, protection of water courses, tunnel spoil and waste management

## 9.4 REPORTING

### 9.4.1 Reporting to Department of Environment

Environmental reports will be prepared at various levels during Project implementation. The main objective of environmental reporting is to document environmental status/progress, compliance to environmental requirements including EIA Conditions of Approval, and the performance or effectiveness of the P2M2 (Table 9-4).

**Table 9-4 : Reports to be Submitted to DOE**

Types of Report
<b>Environmental Management Plan (EMP)</b>
<ul style="list-style-type: none"> <li>- to be prepared for each EMP package</li> <li>- to submit to DOE for approval prior to commencement of construction works</li> </ul>
<b>Monthly Compliance and Monitoring Report</b>
<ul style="list-style-type: none"> <li>- to be prepared and submitted to DOE during the construction stage</li> <li>- include form EIA 1-08 and EIA 2-08</li> </ul>
<b>Monthly Online Erosion and Sediment Control (ESC) Inspection</b>
<ul style="list-style-type: none"> <li>- to be submitted to DOE during the construction stage</li> </ul>
<b>Environmental Audit Report</b>
<ul style="list-style-type: none"> <li>- to be submitted to DOE during the construction stage</li> <li>- frequency of audit will be quarterly</li> </ul>

## 9.5 EXTERNAL COMMUNICATIONS

Effective communication with relevant stakeholders is crucial for such a large Project that traverses four states. A systematic, efficient and prompt response to any queries, feedback and complaints from various stakeholders is important.

The ECRL Project will maintain several communication channels for stakeholders and public to provide feedback. The engagement with stakeholders along the alignment is vital at all stages – planning or pre-construction, construction and operation stages. Engagements serve as an important platform to provide information about the Project to the stakeholders and conversely, for the stakeholders to raise their concerns regarding the Project. The engagement will be continuous in order to address different issues at different Project stages.

Engagements during planning and design stage, particularly during the EIA stage, provided early information about the concerns of the communities likely to be affected by the Project. This information is an important input to the project planners and engineers so that necessary measures can be formulated and incorporated into the Project design to address the concerns, where possible. Most importantly, stakeholders must be informed of the mitigating measures that will be adopted and if required, explain the basis for selecting the mitigating measures.

Stakeholder engagements will also be carried out before commencement of construction works at selected sites (those with specific environmental concerns). The objective of the engagement is to inform stakeholders about the construction works that will be carried out. For example, to share information about the types of works, duration of works, potential impacts and mitigating measures that will be implemented to reduce these impacts and minimise other grievances to the community. Where necessary, MRL will undertake engagement with the media to ensure that appropriate and correct information is disseminated to all stakeholders and the public.

## 9.6 MONITORING PROGRAMME

A comprehensive environmental monitoring programme will be implemented during the construction to monitor the effectiveness of the pollution prevention and mitigating measures (P2M2) and compliance to the environmental requirements. The environmental monitoring programme will include the following environmental components:

- a) Water quality monitoring
- b) Silt trap discharge monitoring
- c) Air quality monitoring
- d) Noise and vibration monitoring
- e) Wildlife monitoring

The monitoring program will be supervised by competent personnel who are able to understand, interpret and analyse the results in relation to the on-going construction works or possible external factors that leads to any non-compliances.

The monitoring of these components will be further categorised into **Performance Monitoring (PM)**, **Compliance Monitoring (CM)**, and **Impact Monitoring (IM)** as discussed in the following subsections.

### 9.6.1 Performance Monitoring

Performance monitoring refers to the monitoring of specific parameters which will act as a precursor to indicate whether all the LD-P2M2 implemented is functioning as designed and effective in mitigating the impacts. The results or findings will be analysed and evaluated to gauge the effectiveness of the P2M2 implemented at the site and documented in the Performance Monitoring Report (PMR).

Performance monitoring will focus on monitoring discharges from the silt traps and inspecting the effectiveness of the silt traps, temporary earth drains, check dams, silt fences and other measures stated in the LD-P2M2 in the EMPs (also see **Chapter 8** of this EIA report). During construction, the performance monitoring will be carried out



by the EO on a weekly basis and after heavy rain events (more than 12.5mm as measured by the rain gauge).

## **9.6.2 Compliance Monitoring**

Compliance monitoring refers to the monitoring of all the P2M2 implemented during construction stage to ensure compliance to the EIA Conditions of Approval (COAs). These will include the monitoring of discharges and emissions from various pollution control facilities on site.

### **9.6.2.1 Water Quality Monitoring**

For this Project, compliance monitoring will involve only the discharges from silt traps that will be built during the construction stage. The full range of parameters to be monitored is as listed in **Table 9-6**. The sampling and analysis will be carried out by SAMM accredited laboratory and on a monthly basis.

## **9.6.3 Impact Monitoring**

Impact monitoring is conducted to verify that the findings of the EIA study are correct, and appropriate mitigation and prevention measures have been implemented to minimise impacts to the environment. Impact monitoring will involve monitoring the ambient levels of the water quality, air quality, noise and vibration at identified locations.

### **9.6.3.1 Water Quality**

Impact monitoring for water quality will include monitoring of the surrounding rivers or waterways near to the alignment, stations and tunnel areas where construction activities are taking place. At this stage, it is proposed that sampling be carried out at the baseline sampling locations (refer **Figures 6.7-1 and 6.7-2** for the locations of the waterways and river crossings). However, other sampling locations will also be identified and proposed in the EMPs.

The full range of parameters to be monitored during construction stage is listed in **Table 9-5**. The sampling and analysis will be carried out by SAMM accredited laboratory and on a monthly basis.

### **9.6.3.2 Air Quality**

Impact monitoring for air quality will involve monitoring of ambient air quality at sensitive receptors surrounding the Project site (alignment, stations, and tunnel areas). At this stage, it is proposed that sampling be carried out at the baseline

sampling locations (Refer **Figures 6.7-1 and 6.7-2** for the locations of the air quality monitoring stations). However, other sampling locations will also be identified and proposed in the EMPs.

The parameters to be monitored during construction stage as well as the allowable limits are listed in **Table 9-5**. The sampling and analysis will be carried out by SAMM accredited laboratory and on a monthly basis.

#### **9.6.3.3 Noise and Vibration**

Impacts of noise and vibration will involve monitoring at sensitive receptors surrounding the Project site (alignment, stations and tunnel areas). At this stage, it is proposed that sampling be carried out at the baseline sampling locations (Refer **Figures 6.7-1 and 6.7-2** for the locations of the noise and vibration monitoring stations). However, other sampling locations will be identified and proposed in the EMPs. The parameters to be monitored during construction stage as well as the allowable limits are listed in **Table 9-5**.

#### **9.6.3.4 Wildlife**

A Wildlife Management Plan will be formulated that would also specify wildlife monitoring requirements during the construction and operation stages of the Project. The Project Proponent and the EIA consultant are currently in discussion with the Department of Wildlife and National Parks (PERHILITAN) to formulate a detailed Wildlife Management Plan. Including a monitoring regime.

### **9.7 ENVIRONMENTAL AUDITING**

A third-party environmental site audit will be carried out every quarter during the construction stage. The main objectives of the audit are to determine whether there is any non-compliances to the environmental requirements as stated in the EIA and EMP as well as to ensure that all the pollution prevention and mitigating measures (P2M2) are properly implemented, functioning as per designed and adequately maintained to ensure its performance.

The site audit will be carried out in accordance to the accepted protocol detailing areas of non-compliance. Any non-compliance with legislative standards will be identified and probable cause of such non-compliances investigated.

## **9.8 ENVIRONMENTAL MAINSTREAMING AND GUIDED SELF-REGULATION**

The Project Proponent is committed to mainstreaming environmental protection into the Project and towards self-regulation to ensure the quality of environment is protected during the construction and operation of the ECRL.

As the owner of this Project, Malaysia Rail Link is fully committed and will take full responsibility and accountability for instituting effective pollution prevention and mitigation measures (P2M2) and regulatory compliance at all stages of project implementation. This self-regulation is also very important to MRL as part of its good governance. MRL will ensure organizational commitment to environmental regulatory compliance by all personnel and at all levels of the organization, including its consultants, contractors, suppliers and all other parties involved in the Project implementation. Competent persons will be appointed to operate the various pollution control and waste management systems of the Project.

### **9.8.1 Environmental Policy (EP)**

MRL will formulate an Environmental Policy to convey the environmental commitment to all parties involved in the Project, including external stakeholders. The Environmental Policy will be attached in the EMP Report and submitted to DOE.

### **9.8.2 Environmental Budgeting (EB)**

Sufficient budget will be set aside solely for the purpose of implementing measures to comply with environmental regulations and other environmental protection measures. The budget will include the installation of pollution control facilities, setting up of mini laboratory facilities, provision of personnel and purchase of performance monitoring equipment during construction stage, as well as budget for pollution control and waste management during the operational phase. The environmental budget for each of the packages will be detailed in the EMP Report.

### **9.8.3 Environmental Monitoring Committee (EMC)**

The **Environmental Performance Monitoring Committee (EPMC)**, chaired by MRL, will monitor the environmental performance and effectiveness of pollution prevention and mitigation measures (P2M2) and status of regulatory compliance of the Project.

The EPMC will be represented by all parties involved during the construction stage and will be chaired by senior management personnel from MRL. The chairman will be responsible for all the decisions made during EPMC meetings. The meetings must be held regularly, at least once a quarter, and the minutes of meeting properly

documented and maintained. Additionally, an Environmental Regulatory Compliance Monitoring Committee, which meets at least once a year, shall be chaired by the CEO or Chairman of MRL.

#### **9.8.4 Environmental Facility (EF)**

The Environment Facilities include best management practices, scheduled waste management, sewage treatment system, performance monitoring equipment and associated support facilities such as mini laboratory during the construction and operational stages. The assessment of the adequacy of the EFs installation and their effectiveness in complying with the regulatory standards and requirements or conditions approval will be rated and documented as part of the Guided Self-Regulation (GSR).

#### **9.8.5 Environmental Competency (EC)**

Competent persons will be appointed to operate the various pollution control and waste management systems of the Project. In addition, a comprehensive training program to produce competent persons and trained support staff will be provided to ensure full compliance with the DOE requirements. The names of the competent persons and the training plans will be submitted to DOE.

The monitoring program will be supervised by competent personnel who are able to understand, interpret and analyse the results in relation to the on-going construction works or possible external factors that leads to any non-compliances.

#### **9.8.6 Environmental Reporting and Communication (ERC)**

##### **9.8.6.1 Internal Reporting**

In accordance to the DOE's requirements, other internal environmental reports will be prepared during the construction stage, including:-

- Environmental Performance Monitoring Document (EPMD)
- Performance Monitoring Report (PMR)

In addition to the reports mentioned above, other documents that need to be prepared and maintained include the Checklist of P2M2s List Sheet, Installation Sheet, Maintenance Sheet, Site and P2M2 Inspection Sheet, Photograph Folder Sheet, Corrective Action Sheet, Performance Monitoring Sheet and others. The EPMD and PMR will be maintained for five years after completion of Project development.

### **9.8.6.2 Environmental Performance Monitoring Document**

Before the commencement of site works for each construction package, the Environmental Officer (EO) will prepare the Environmental Performance Monitoring Document (EPMD). The EPMD will describe in detail how the contractor will comply with the EIA Conditions of Approval (COA) as well as ensuring that all the P2M2 are functioning and effective in mitigating the impacts. The details will include, among others: performance monitoring equipment/ instruments, sampling protocols and analysis, monitoring parameters, sampling frequency, preventive and corrective maintenance procedure for the P2M2, discharge compliance, record keeping and others. The EPMD will also include Compliance Monitoring (CM) and Impact monitoring (IM), wherever relevant.

### **9.8.6.3 Performance Monitoring Report**

Environmental monitoring will be conducted as specified in the EPMD and the findings or results obtained from the monitoring exercise will be discussed in the Performance Monitoring Report (see template in **Chart 9-2 and Chart 9-3**). The results or findings will be analysed and evaluated to gauge the effectiveness of the Pollution Prevention and Mitigating Measures (P2M2) implemented at the site. Comparison will be made against the recommended standards or guidelines. Statistical techniques and graphical presentations of the results will be prepared wherever appropriate. The PMR will also make definitive conclusions on the overall performance of the P2M2 and suggest improvement measures to be taken, if necessary. The PMR will be submitted to the EPMC of the Project and the document shall be kept and maintained for inspection by DOE officers.

### **9.8.7 Environmental Transparency (ET)**

The best option to implement the environmental transparency (Environmental Sustainability Report / Web site / Billboards/ fliers, etc.) will be taken into consideration and implemented at a later date during construction and operation stages. Environmental sustainability reporting is proposed to be incorporated into the company's corporate reporting.

### **9.8.8 Environmental Mainstreaming Tools Compliance Report**

The Environmental Mainstreaming Tools Compliance Report (EMT Compliance Report) will be submitted to the DOE, at least thirty days before the commencement of work on site. The example of the template is shown in **Chart 9-4**.

**Chart 9-2 : Performance Monitoring Report Template**

<b>EAST COAST RAIL LINK PROJECT</b> <b>NAME OF THE CONTRACTOR</b> <b>Contract No:</b> <b>LD-P2M2 COMPONENTS (e.g. silt trap, hydroseeding)</b>																																									
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**Chart 9-3 : Performance Monitoring – Environmental Control Measures Template**

Date of EIA Approval:  
Condition of Approval (COA) Ref. No. :  
Date of EMP Approval:  
EMP Approval Ref. No. :  
Date of ESCP Approval:  
ESCP Approval Ref. No. :

No	Location	Control Measure	Provision		Status (Installation)	Response From Contractor	Observations/Findings/ Suggestions (Last Inspection - Date)	Observations/Findings/ Suggestions (Recent Inspection - Date)	Observations/Findings/ Suggestions (Latest Inspection - Date)	Accepted (✓/X)
			ESCP	Actual						
A. Silt Trap And Vicinity Area										
1.	Location A	Silt Trap No.			Installation Date :  Status:  Last Maintenance Date :	Proposed Action / Action Taken:  Next Maintenance Date:	Observation:  Suggestions/ Recommendations:	Observation:  Suggestions/ Recommendations:	Observation:  Suggestions/ Recommendations:	
2.	Location B									



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### Chart 9-4 : Environmental Mainstreaming Tools Compliance Report

Name of Company / organization:

Address:

DOE's reference file:

Name of EMT Compliance Report preparer:

Designation:

Date:

Signature

#### ENVIRONMENTAL MAINSTREAMING TOOLS COMPLIANCE TABLE

EMT		Date of Implementation	Self-assessment of strength of EMT	Comments (if any)
EP				
EB				
EMC	EPMC			
	ERCMC			
	BMPs			
	IETS			
	APCS			
	SWMI			
EF	LABF			
	PMI			
	Others			
EC	CSEC			
	CePIETSO			
	CePSWAM			
	CePSO			
	CeBFO			
	Others			
ERC	CC			
	DA			
	IR			
	Others			
ET	ESR			
	WS			
	BB			
	FL			

#### EP= Environmental Policy

Give the date the EP was formulated and the review date, if EP review was made. If EP is newly formulated, give the date of its formulation. Make your own assessment of the strength of the message of environmental commitment in you EP by assigning your own rating (1: Poor; 2: Fair; 3: Average; 4: Good; 5: Excellent). Submit your current EP as evidence

**EB= Environmental Budgeting**

Give the date your organization started or will start allocating budget specifically for environmental purposes. Make your assessment of the adequacy of the EB for implementing measures to comply with environmental requirement of the EQA and its regulations or approvals conditions by assigning your own rating (1: Poor; 2: Fair; 3: Average; 4: Good; 5: Excellent). Provide a statement stating the amount of EB for the previous year as evidence.

**EMC= Environmental Monitoring Committee**

Give the dates the EPMC and ERCMC were set up or will be set up in your organization. Make your own assessment of the strength of the representativeness of the members of the committees by assigning your own rating (1: Poor; 2: Fair; 3: Average; 4: Good; 5: Excellent). Submit the organization charts of the EPMC and ERCMC as evidence.

**EF= Environmental Facility**

IETS = Industrial Effluent Treatment System; APCS = Air Pollution Control System; BMP= Best Management Practices; SWMI= Scheduled Waste Management Infrastructure; LABF= Laboratory Facilities; PMI= Performance Monitoring Instruments.

Give the dates the EF components were installed or will be installed in your organization. Make your own assessment of the adequacy of the EFs installation and their effectiveness in complying with the regulatory standards and requirements or approval conditions by assigning your own rating ((1: Poor; 2: Fair; 3: Average; 4: Good; 5: Excellent). Provide information on EF components which are relevant to your organization.

**EC = Environmental Competency**

CSEC- Certified Sediment and Erosion Control; CePIETSO = Certified Environmental Professional in IETS Operation; CePSO = Certified Environmental Professional in Scrubber Operation; CeBFO= Certified Environmental Professional in Bag Filter Operation; CepSWAM = Certified Environmental Professional in Scheduled Waste Management.

Give the date the organization's personnel were certified or will be attending the certification course(s). Make your own assessment of the adequacy of the number of personnel required by your organization to comply with the regulatory requirements or approval conditions by assigning your own rating (1: Poor; 2: Fair; 3: Average; 4: Good; 5: Excellent). Provide the name of the Competent persons in your organization or submit your training plan to get your staff certified as evidence. Provide information only on EC requirements which are relevant to your organization.

**ERC=Environmental Reporting and Communication**

CC= Communication Channel; DA = Data Analysis; IR = Internal Reporting.

Give the dates your organization started to implement or will start to implement the ERC components (CC, DA and IR). Make your own assessment of the adequacy of the ERC components and their effectiveness in ensuring environmental concerns are immediately reported to the responsible persons in your organization for appropriate action by assigning your own rating ((1: Poor; 2: Fair; 3: Average; 4: Good; 5: Excellent). Submit CC flow chart as evidence.

**Table 9-5 : Proposed Monitoring Programme**

MONITORING COMPONENTS	LOCATION	FREQUENCY	PARAMETERS	COMPLIANCE LEVELS		REPORTING REQUIREMENTS
CONSTRUCTION PHASE						
Water quality	<b><u>Performance Monitoring</u></b> <ul style="list-style-type: none"><li>All LD-P2M2 on site</li></ul>	<ul style="list-style-type: none"><li>Weekly</li><li>After heavy rainfall (&gt;12.5mm as measured by rain gauge)</li></ul>	Structural integrity, functionality, practicality and frequency of maintenance for all P2M2.	<ul style="list-style-type: none"><li>Design of P2M2 to comply with MSMA 2<sup>nd</sup> Edition specifications</li><li>Performance monitoring to be conducted by CESSWI certified or equivalent personnel</li></ul>		Weekly reporting in Performance Monitoring Report (PMR). PMR to be kept on site for DOE inspection.
	<b><u>Compliance Monitoring</u></b> <ul style="list-style-type: none"><li>Silt trap or sediment basin discharge points</li></ul>	<ul style="list-style-type: none"><li>Monthly</li></ul>	<ul style="list-style-type: none"><li>TSS</li><li>Turbidity</li></ul>	<ul style="list-style-type: none"><li>50 mg/l</li><li>250 NTU</li></ul>		Monthly to respective DOE state offices
	<b><u>Impact Monitoring</u></b> <ul style="list-style-type: none"><li>Similar to baseline monitoring of rivers : 33 stations in total</li><li>Kelantan : 15 stations</li><li>Selangor : 18 stations</li></ul>	<ul style="list-style-type: none"><li>Monthly</li></ul>	<ul style="list-style-type: none"><li>Temperature</li><li>pH</li><li>DO</li><li>COD</li><li>BOD</li><li>TSS</li><li>Turbidity</li><li>O&amp;G</li><li>NH<sub>3</sub>-N</li><li><i>E.coli</i></li></ul>	<ul style="list-style-type: none"><li>Normal + 2 °C</li><li>6-9 mg/l</li><li>5-7 mg/l</li><li>25 mg/l</li><li>3 mg/l</li><li>50 mg/l</li><li>50 (NTU)</li><li>N</li><li>0.3 mg/l</li><li>- (MPN/100ml)</li><li>(NWQS Class II)</li></ul>	<ul style="list-style-type: none"><li>Normal + 2 °C</li><li>5-9 mg/l</li><li>3-5 mg/l</li><li>50 mg/l</li><li>6 mg/l</li><li>150 mg/l</li><li>- (NTU)</li><li>N</li><li>0.9 mg/l</li><li>- (MPN/100ml)</li><li>(NWQS Class III)</li></ul>	
				Compliance limit based on respective baseline NWQS class of each station		

Note : - means not available, N means No visible floatable materials or debris, no objectional odour or no objectional taste

MONITORING COMPONENTS	LOCATION	FREQUENCY	PARAMETERS	COMPLIANCE LEVELS	REPORTING REQUIREMENTS
Air quality	<b><u>Impact Monitoring</u></b> <ul style="list-style-type: none"> <li>Similar to baseline monitoring at sensitive receptors : 12 stations in total</li> <li>Kelantan : 3 stations</li> <li>Selangor : 9 stations</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	TSP (24 hours monitoring)	260 µg/m <sup>3</sup> Malaysian Ambient Air Quality Standards	Monthly to respective DOE state offices
Noise quality	<b><u>Impact Monitoring</u></b> <ul style="list-style-type: none"> <li>Similar to baseline monitoring at sensitive receptors : 41 stations in total</li> <li>Kelantan : 15 stations</li> <li>Selangor : 26 stations</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	L <sub>eq</sub> , L <sub>min</sub> , L <sub>max</sub> , L <sub>10</sub> , L <sub>90</sub> (24 hours monitoring)	L <sub>eq</sub> + 3 dB(A)  The Planning Guidelines For Environmental Noise Limits And Control (Schedule 3) or DOE's conditions of approval limit, if any	Monthly to respective DOE state offices
Vibration	<b><u>Impact Monitoring</u></b> <ul style="list-style-type: none"> <li>Similar to baseline monitoring at sensitive receptors : 41 stations in total</li> <li>Kelantan : 15 stations</li> <li>Selangor : 26 stations</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	Peak Particle Velocity (1 hour monitoring)	The Planning Guidelines For Vibration Limits And Control in the Environment - Schedule 6: Recommended Limits for Human Response and Annoyance from Short Term Vibrations, Curve 8 to Curve 16.	Monthly to respective DOE state offices