VIETNAM ROAD ASSET MANAGEMENT PROJECT
Component B: Road Asset Preservation
ENVIRONMENTAL MANAGEMENT PLAN (EMP)

B3-1: National Highway No.48
Section: Sta0+000 - Sta20+000 & Sta38+000 - Sta64+000
VIETNAM ROAD ASSET MANAGEMENT PROJECT
Component B: Road Asset Preservation
ENVIRONMENTAL MANAGEMENT PLAN (EMP)
B3-1: National Highway No.48
Section: Sta0+000 - Sta20+000 & Sta38+000 - Sta64+000

Hanoi, June 2013
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<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>CSC</td>
<td>Construction Supervision Consultant</td>
</tr>
<tr>
<td>CEMP</td>
<td>Community Environmental Monitoring Program</td>
</tr>
<tr>
<td>DRVN</td>
<td>Directorate for Roads of Vietnam</td>
</tr>
<tr>
<td>DUNRE</td>
<td>District Unit Natural Resources and Environmental</td>
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<tr>
<td>DONRE</td>
<td>Department of Natural Resources and Environment</td>
</tr>
<tr>
<td>EPC</td>
<td>Environmental Protection Commitment</td>
</tr>
<tr>
<td>EO</td>
<td>Environmental Officer of Environmental Unit (Under PMU3)</td>
</tr>
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<td>EU</td>
<td>Environmental Unit (under PMU3)</td>
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<td>EMP</td>
<td>Environmental Management Plan</td>
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<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>GoV</td>
<td>Vietnam Government</td>
</tr>
<tr>
<td>IEMC</td>
<td>Independent Environmental Monitoring Consultant</td>
</tr>
<tr>
<td>MOT</td>
<td>Ministry of Transport</td>
</tr>
<tr>
<td>PR</td>
<td>Provincial Road</td>
</tr>
<tr>
<td>NH</td>
<td>National Highway</td>
</tr>
<tr>
<td>OP</td>
<td>Operation policies</td>
</tr>
<tr>
<td>PMU3</td>
<td>Project Unit Management No.3</td>
</tr>
<tr>
<td>RAP</td>
<td>Resettlement Action Plan</td>
</tr>
<tr>
<td>SEMP</td>
<td>Site Environmental Monitoring Program</td>
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<td>SEO</td>
<td>Safety and Environment Officer</td>
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<tr>
<td>SES</td>
<td>Workplace Safety and Environment Supervisor</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
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</table>
1. **Introduction**

Subproject “Periodic Maintenance of NH48 - Section (Km0+000-Km20+000) and Section (Km38+000-Km64+000)” is one of the subprojects under Component B of the Vietnam Road Asset Management Project (VRAMP) funded by the World Bank. The subproject will be implemented in eighteen communes of five districts of Nghe An Province.

The periodic maintenance activities of subproject include strengthening the pavement, repairing the damaged road surfaces and the road drainage system, and improving traffic safety and protection facilities of the selected sections of the National Highway 48 (NH48). These activities may cause negative impacts on the local environment and communities during pre-construction, construction, and operation phases.

An environmental screening was undertaken in line with the World Bank safeguards policy requirements and it showed that the World Bank’s policy on Environmental Assessment (OP 4.01) will be triggered for the subproject. The implementation of the subproject would mainly cause increased dust generation, air pollution, and domestic wastes, and traffic safety. However, these impacts are not significant, temporary, localized, and can be mitigated with available mitigation measures. Therefore, the subproject is assessed as B environmental category and eligible for funding by the World Bank.

The Government’s regulation on environmental assessment requires submission of an Environmental Protection Commitment (EPC) for the subproject. An EPC report has been prepared, submitted to Dien Chau District People’s Committee – Nghe An province. In addition to fulfilling the government requirements, an Environmental Management Plan (EMP) that complies with the World Bank OP 4.01 has also been prepared for the subproject.

The main objective of this EMP is to establish a set of mitigation and monitoring measures to minimize the adverse social and environmental impacts that can take place during the implementation stage of the subproject. The measures especially focus on sensitive receptors or sensitive locations. The EMP also provides specific information about the monitoring program during construction stage including locations, frequency and reporting process.

The EMP addresses all issues identified in the EPC: i) organizes all measures to mitigate environmental impacts during the construction and operation; and (ii) establishes an organizational structure, procedures, institutional responsibilities for EMP implementation, and a budget and source of financing for each activity.

The EMP will also assist different stakeholders in managing the environmental issues of NH48: (a) The PMU3 - to help with the management and implementation of the EMP; (b) supervisors – to ensure that the EMP is properly implemented; (c) environmental engineers – to assist them to work with the Contractors to implement the EMP; and (d) Contractors – to help them develop subproject-specific EMP implementation plans.

In addition to the subproject-specific mitigation measures included in the EPC and EMP, the NH48 VRAMP subproject will be also in compliance with Vietnamese Standards (TCVN) and National Technical Regulations (QCVN) and the World Bank Safeguard Policies. Appendix 1 presents the most relevant environmental standards of the Socialist Republic of Vietnam.

2. **EMP Organization and Structure**

The EMP contains guiding environmental principles and procedures for communication, reporting, training, monitoring and plan review to which all staff, consultants, supervisors, Contractors and sub-Contractors are required to comply with throughout the pre-construction, and constructions stages of the Subproject.
The EMP is structured as follows:

**Introductions:** describes EMP objectives and structure of EMP;

**Overview of Environmental and Social Issues:** summarizes the project description and main environmental and social impacts, the approach for identification of environmental issues along the road alignment and summarizes the main mitigation measures.

**Roles and Responsibilities for Environmental Management during Construction:** This part will define the roles and responsibilities for environmental management for all actors involved in the project, and the process of control and reporting.

**Compliance Framework:** This part will define the environmental duties of the contractor(s), and the environmental compliance framework that will be put in place, the environmental standards for all mitigation measures, the environmental supervision of civil works, and the independent monitoring consultant.

**EMP Implementation Plan:** describes the requirements and staffing needs for initiation of the works, for the Contractor and supervision consultant. It also includes the capacity building and training programs that will need to be implemented for all actors involved in the environmental management of the project.

**Monitoring Program:** an environmental monitoring framework for the project is established including parameters, frequency, and responsibilities for monitoring environmental impacts during construction and operation of the road.

**Budget:** Budget estimates for the implementation of the EMP will be presented.

**Appendices:** related to the project and the contents of the EMP.

3. **Subproject Description**

3.1. **Subproject objectives**

The NH48 is a part of the Vietnam national highway system, this road is a high strategic road from the East to the West and is instrumental for connecting the National Highway 1A (NH1A) to the districts in the North-West of Nghe An province and Lao PDR.

Currently, the road is adversely affected by the flow of heavy trucks, especially by vehicle transport from the West of Nghe An to NH1A. Therefore, the maintenance work of NH48 is very necessary to ensure that sustainable and safe traffic from the east and west, as well as to develop trade with the western provinces of Lao PDR.

3.2. **Location**

Sub-project of NH48, sections (Km0+000 - Km20+000) and (Km38+000 - Km64+000) is located in the northeast of Nghe An Province (Figure 1), with a total length of 46km which is composed of two sections as follows:

− Section 1: Km0+000 - Km20+000
  + Starting point: Km0+000 ≡ Km412+800 (Station of NH1A), Yen Ly T-Junction belonging to Dien Yen Commune, Dien Chau District, Nghe An Province;
  + Ending point: Km20+000 belonging to Nghia Thuan Commune, Thai Hoa District, Nghe An Province;

− Section 2: Km38+000 - Km64+000
  + Starting point: Km38+000 belonging to Quang Tien Commune, Nghia Dan District, Nghe An Province;
Ending point: Km64+000 belonging to Yen Hop Commune, Quy Hop District, Nghe An Province;

Subproject passes through territories of Dien Chau District, Quynh Luu District, Nghia Dan District, Quy Hop District, and Thai Hoa Town (Nghe An Province).

In general, the road passes mainly through populated area; topography is mainly low mountains and hills. Apart from the residential area, there are rice and acacia land along the project area.

At present, many heavy trucks transporting stone, wood and oversized vehicles appear constantly on NH48, so road surface is degraded seriously that cause traffic safety condition has become alarming.
Figure 1. Subproject Location
3.3. **Main components of the Subproject**

The whole route was improved to secure the standard of mountain road standard grade III (section 1) and IV (section 2).

The following items are expected to implement:

1. **Road portion:**
   - Strengthen pavement of NH48 (including 28 sections with a total length of about 46km).
   - Repairing the positions of damaged road surface (including 261 sections with a total length of about 1.73km).
   - Spreading more a layer of asphalt concrete (medium size) with the thickness of 5mm on the whole length of two sections.

2. **Bridge portion:** connection of approach bridges are ensured smoothly at 14 existing bridges.

3. **Intersection:** connection is ensured smoothly, adding traffic signs, road marking at existing 6 intersections.

4. **Drainage:** There are 111 existing culverts and manholes
   - Repairing and dredging the damaged culverts, poor drainage culverts affecting the old pavement.
   - Dredging the culverts, which are still good condition and sufficient drainage aperture.
   - Reinforcing the ditches, which are not yet reinforced or damaged.
   - Constructing new 3650m ditches.
   - Adding 14 locations of culverts.

5. **Traffic safety and protection facilities:**
   - Replacing guard post and traffic sign which are damaged.
   - Adding road marking of rumble strip, guard post, guardrail with delineator, which are used to guide the direction and ensure traffic safety at locations with high embankment over 2÷4m, two approach roads and dangerous section.

3.4. **Work volume**

The Subproject will conduct the following work items: i) buckling offsetting construction, reinforcing the old pavement etc. to ensure the road standards; ii) designing longitudinal grooves at the flooding sections and reinforcing the slopes at the unstable sections to stabilize the road-bed; and iii) adding and supplementing the paint mark system, milestones, etc. on the whole road.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Unit</th>
<th>Section Km0+000 - Km20+000</th>
<th>Km38+000 - Km64+000</th>
<th>Total</th>
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<tr>
<td>I</td>
<td>Preparation works</td>
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<td>-</td>
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<td>II.1</td>
<td>Road surface of main alignment</td>
<td></td>
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</tr>
<tr>
<td>1</td>
<td>Structure Type 1</td>
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<tr>
<td>No.</td>
<td>Item</td>
<td>Unit</td>
<td>Section</td>
<td>Total</td>
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<td>Km0+000 - Km20+000</td>
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<td>1,145.16</td>
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<td></td>
<td>Bitumen spray with 1Kg of bitumen per square meter</td>
<td>m²</td>
<td>1,145.16</td>
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<td>195,663.50</td>
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<td>Structure Type 5</td>
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<td>Section Km38+000 - Km64+000</td>
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<td>Medium particle asphalts</td>
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<td>Bitumen spray with 0.5Kg of bitumen per square meter</td>
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<td>515</td>
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<td>II.3</td>
<td>Stretching connected to old bridge abutment</td>
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<td>25.20</td>
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<td>Buckled offset by Macadam level type 1</td>
<td>m³</td>
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<td>Filling up road-bed by soil with compactness is K95</td>
<td>m³</td>
<td>1,218.64</td>
<td>1,252.16</td>
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<td>III</td>
<td>Road-bed treatment (sagging, sinking, emerging, splitting along wheel)</td>
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</tr>
<tr>
<td></td>
<td>Digging pavement structure, thickness 50cm</td>
<td>m³</td>
<td>572.58</td>
<td>2,608.45</td>
<td>3,181.03</td>
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<td>IV</td>
<td>Urban road</td>
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</tr>
<tr>
<td>1.</td>
<td>Raising the wall of concrete longitudinal groove with cover (width B=0.8m and thickness 10cm)</td>
<td>m</td>
<td>1,500</td>
<td>2,500</td>
<td>4,000</td>
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<tr>
<td>2.</td>
<td>Added the groove cover</td>
<td>m</td>
<td>700</td>
<td>1,500</td>
<td>2,200</td>
</tr>
<tr>
<td>3.</td>
<td>Building new longitudinal drainage grooves</td>
<td>m</td>
<td>1,850</td>
<td></td>
<td>1,850</td>
</tr>
<tr>
<td>V</td>
<td>Drainage works</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Drainage grooves</td>
<td>m</td>
<td>500</td>
<td>1,300</td>
<td>1,800</td>
</tr>
</tbody>
</table>
### NH48 Environmental Management Plan

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Unit</th>
<th>Section</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>stone and cement mortar M100</td>
<td></td>
<td>Km0+000 - Km20+000</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Horizontal people's life Culvert</td>
<td>m</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>3.</td>
<td>Drainage culvert</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Building high of old culvert by stone</td>
<td>m³</td>
<td>58.50</td>
<td>66.38</td>
</tr>
<tr>
<td></td>
<td>and cement mortar M100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cleaning the culverts</td>
<td>m³</td>
<td>156</td>
<td>177</td>
</tr>
</tbody>
</table>

#### VI. Traffic safety system

1. Painted road markings
   - Painted road markings with 3.0mm of thickness | m² | 11,934.53 | 14,918.70 | **26,853.23**
   - Painted deceleration bar with 8.0mm of thickness | m² | 2,150 | 2,975 | **5,125**

2. Setup new signal board
   - Reflective circle signage | Board | 7 | 5 | **12**
   - Reflective triangle signage | Board | 12 | 15 | **27**
   - Rectangular Reflective signage | Board | 2 | 4 | **6**

3. Painted the old signal board | Board | 15 | 30 | **45**

4. Setup new concrete milestone | m | 1,200 | 1,300 | **2,500**

5. Setup new the kilometer milestone | Milestone | 1 | 2 | **3**

6. Setup new the H milestone (100m/milestone) | Milestone | 50 | 75 | **125**

The material quantity that will be used for the subproject is not much; therefore, the construction materials will be bought from the borrow pits, quarries, and construction material sources that authorized by the local authorities (e.g. soil, stone, bitumen, concrete, asphalt, etc.). When construction starts, the contractor shall require these companies submit the certificate for environmental protection commitment for these borrow pits, quarries, and other material sources.

Since this is a road maintenance project, there would not be many workers on the construction site, with each maintenance package usually requiring about fifteen workers.

#### 4. Environmental and Social Impacts

##### 4.1. Environmental Impacts

The Sub-Project of NH48 is implemented base on existing roadbed, so there is no requirement on land acquisition; environmental impact in pre-construction phase is considered in small level. Most of environmental impacts are occurring on construction phase. Therefore, environmental management in the construction phase is the main contents of this EMP.

Asphalt concrete will be bought at the asphalt plants are available in the Nghe An Province. When construction starts, the contractor shall require this company submit the certificate environmental protection commitment for asphalt plant. Therefore, do not need to asset the impacts of asphalt plant.

Table 2 below describes the potential impacts on environmental and social during construction phase.
### Table 2. Potential Impact on Environmental and Society of Project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential Impact</th>
<th>Location</th>
<th>Impact Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential impacts during construction stage</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Demolition of old damaged pavement and dust cleaning | Air pollution caused by dust and impact on community health | - Sections of strengthening pavement and repairing roadbed and pavement.  
- Residential areas, school, state agencies near construction locations. | Small to medium |
| Transportation of material and waste, operation of construction machines | | - Along the transportation roads (NH48C, PR537…etc and local roads).  
- Residential areas, school, state agencies near construction locations. | Small to medium |
| Construction activities | Noise pollution | - Residential areas, school, state agencies near construction locations. | Small |
| Transportation of material and waste | | | Medium |
| - Demolishing and scraping pavement to create roughness  
- Digging out the old roadbed.  
- Digging, clearing drainage culverts, ditches.  
- Construction activities of machines.  
- Maintenance construction machines. | Environmental pollution and worsening landscape due to solid waste  
Surface water pollution caused by waste oil and oil-containing wastes | - At the sections of strengthening pavement and repairing roadbed and pavement.  
- At the locations of repairing and adding culverts, ditches.  
- At the locations near the source of surface water. | Small to medium |
| - Arranging construction machines  
- Transportation of material and waste | Cause traffic unsafely and traffic obstruction on the route. | - At the construction locations.  
- Along the transportation roads (NH48C, PR537… etc and local roads). | High |
| Transportation of material and waste | Cause damages to the public utilities. | Local roads used for Transportation of material and waste. | Medium |
| Worker presence at the construction site | Impact on community health. | At the construction locations | Small |
| Material exploitation | - Generate dust, noise, vibration.  
- Cause damages to the public | - At the borrow pits.  
- Along the transportation roads (NH48C, PR537… etc and local roads). | Small |
<table>
<thead>
<tr>
<th>Location</th>
<th>Sensitive Area or Activity</th>
<th>Mitigation Measures</th>
</tr>
</thead>
</table>
| Km0+000 – Km1+641 | - The beginning section of route passes through residential area of Yen Ly Commune. The remaining section passes through sparsely resident area; there is mainly agricultural land with rice and corn.  
- Culverts and side ditches are needed to repair and clean. | - When construction passes through residential area of Yen Ly Commune and Quynh Luu No.1 High School, it is necessary to restrict the dust and noise.  
- In construction phase, it should note to collect and not dump the waste into agricultural land.  
- Ensure safety traffic on the route, especially at intersection of starting point and Quynh Luu No.1 High School’s entrance.  
- A reasonable plan for repairing and cleaning of culverts and side ditches will be establishes to avoid flooding. |
| Km1+641 – Km3+320 | - Section Km1+650 ÷ Km2+500: Residents are living along the route. The remaining section passes through sparsely residential area; there is mainly agricultural land with rice, corn and acacia.  
- A small river cuts the route at | - When construction passes through residential areas at section Km1+650 ÷ Km2+500, it is necessary to restrict the dust and noise.  
- In construction phase, it should note to collect and not dump the waste into the surface water resource at Km1+700 and |
<table>
<thead>
<tr>
<th>Location</th>
<th>Sensitive Area or Activity</th>
<th>Mitigation Measures</th>
</tr>
</thead>
</table>
|          | Km1+700.                 | - Ensure safety traffic on the route.  
|          |                          | - A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding. |
| Km3+320 – Km5+580 | - The route passes through sparsely residential area, mainly through agricultural land with corn and acacia.  
| | - A small group of residents are living at Km5+400  
| | - Four culverts are needed to repair and clean. | - When construction passes through residential area at Km5+400, it is necessary to restrict the dust and noise.  
| | | - In construction phase, it should note to collect and not dump the waste into agricultural land.  
| | | - Ensure safety traffic on the route.  
| | | - A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding. |
| Km5+580 – Km7+740 | - The residents of Dien Lam Commune are living along the route, interspersed with agricultural land.  
| | - Dien Lam Secondary School and People Committee of Dien Lam Commune are located at Km6+800.  
| | - Culverts and side ditches are needed to repair and clean. | - When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school and People Committee of Dien Lam Commune.  
| | | - In construction phase, it should note to collect and not dump the waste into agricultural land.  
| | | - Ensure safety traffic on the route, especially on time when pupils leave Dien Lam Secondary School.  
| | | - A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding. |
| Km7+740 – Km9+960 | - The residents of Dien Lam Commune are living along the route at Km7+800 and Km9+500. The remaining section passes through agricultural land.  
| | - Dien Lam No.2 Secondary School is located at Km9+500.  
| | - Culverts and side ditches are needed to repair and clean. | - When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school area.  
| | | - In construction phase, it should note to collect and not dump the waste into agricultural land.  
| | | - Ensure safety traffic on the route, especially on time when pupil leave Dien Lam No.2 Secondary School.  
| | | - A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding. |
| Km9+960 – Km12+220 | - Sparse resident area is interspersed with agricultural land.  
| | - A pagoda is located at Km10+250 and church is located at Km10+950  
| | - Irrigation ditch on the left of route | - When construction passes through pagoda and church area, it is necessary to restrict the dust and noise, especially on festival days.  
<p>| | | - In construction phase, it should note to... |</p>
<table>
<thead>
<tr>
<th>Location</th>
<th>Sensitive Area or Activity</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Km12+220 – Km14+540</td>
<td>- The route passes through agricultural land.</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
</tr>
<tr>
<td></td>
<td>- Culverts are needed to repair and clean.</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km14+540 – Km16+760</td>
<td>- Sparse resident area is interspersed with agricultural land.</td>
<td>- When construction passes through residential area, especially Quynh Luu No.4 High School, it is necessary to restrict the dust and noise.</td>
</tr>
<tr>
<td></td>
<td>- Quynh Luu No.4 High School is located at Km16+500.</td>
<td>- In construction stage, it should note to collecting and not dumping waste, into agricultural land.</td>
</tr>
<tr>
<td></td>
<td>- People Committee of Quynh Chau Commune (Km16+800) and Quynh Chau Primary School with 60m distance from the route</td>
<td>- Ensure safety traffic on the route, especially on time when the pupils leave Quynh Luu No.4 High School.</td>
</tr>
<tr>
<td></td>
<td>- Culverts are needed to repair and clean.</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km16+760 – Km18+900</td>
<td>- The residents of Quynh Chau Commune are living along the route, interspersed with agricultural land.</td>
<td>- When construction passes through residential areas, especially Quynh Chau Primary School, it is necessary to restrict the dust and noise.</td>
</tr>
<tr>
<td></td>
<td>- People Committee of Quynh Chau Commune (Km16+800) and Quynh Chau Primary School with 60m distance from the route</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
</tr>
<tr>
<td></td>
<td>- Culverts are needed to repair and clean.</td>
<td>- Ensure safety traffic on the route, especially on time when the pupils leave Quynh Chau Primary School.</td>
</tr>
<tr>
<td></td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km18+900 – Km20+080</td>
<td>- The route passes through agricultural land with acacia and eucalyptus.</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
</tr>
<tr>
<td></td>
<td>- Side ditches are needed to repair and clean.</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km38+000 – 42+200</td>
<td>- Sparse resident area is interspersed with agricultural land.</td>
<td>- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school area.</td>
</tr>
<tr>
<td></td>
<td>- People Committee of Nghia Tien Commune (Km40+800) and People Committee of Nghia Tan Commune (Km41+000) area located on the left</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
</tr>
<tr>
<td></td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td></td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
<td>- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school area.</td>
</tr>
<tr>
<td></td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Location</td>
<td>Sensitive Area or Activity</td>
<td>Mitigation Measures</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>of the route</td>
<td>- Ensure safety traffic on the route.</td>
</tr>
<tr>
<td></td>
<td>- Side ditches are needed to repair and clean</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km42+200 – Km45+000</td>
<td>- Sparse resident area is interspersed with agricultural land.</td>
<td>- When construction passes through residential areas, it is necessary to restrict the dust and noise.</td>
</tr>
<tr>
<td></td>
<td>- People Committee of Nghia Lien Commune (Km42+000) is located on the left of the route.</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land and residential area.</td>
</tr>
<tr>
<td></td>
<td>- Side ditches are needed to repair and clean</td>
<td>- Ensure safety traffic on the route.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km45+000 – Km47+800</td>
<td>- The route passes through concentration residential area.</td>
<td>- When construction pass through residential areas, especially are nearby Nghia Xuan No.1 Primary School, it is necessary to restrict the dust and noise.</td>
</tr>
<tr>
<td></td>
<td>- People Committee of Nghia Hieu Commune is located on the left of the route (Km 45+500),</td>
<td>- In construction stage, it should note to collecting and not dumping waste into residential area and agricultural land.</td>
</tr>
<tr>
<td></td>
<td>and Nghia Xuan No.1 Primary School is located on the right of the route (Km 47+600).</td>
<td>- Ensure safety traffic on the route, especially school’s entrance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km47+800 – Km50+600</td>
<td>- The route passes through agricultural land with acacia and eucalyptus.</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
</tr>
<tr>
<td></td>
<td>- Side ditches are needed to repair and clean</td>
<td>- Ensure safety traffic on the route.</td>
</tr>
<tr>
<td>Km50+600 – Km54+100</td>
<td>- Sparsely residential is interspersed with agricultural land.</td>
<td>- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at area nearby People Committee of Nghia Xuan Commune.</td>
</tr>
<tr>
<td></td>
<td>- Two rivers cut the route at Tong Hop and Dinh Bridge.</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land as well as surface water resource in the rivers.</td>
</tr>
<tr>
<td></td>
<td>- People Committee of Nghia Xuan Commune (Km52+700) is located on the left of the route.</td>
<td>- Ensure safety traffic on the route.</td>
</tr>
<tr>
<td></td>
<td>- Side ditches are needed to repair and clean</td>
<td>- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.</td>
</tr>
<tr>
<td>Km54+100 – Km56+900</td>
<td>- The route passes through sparsely residential area.</td>
<td>- When construction passes through residential areas, it is necessary to restrict the dust and noise.</td>
</tr>
<tr>
<td></td>
<td>- Side ditches are needed to repair and clean</td>
<td>- In construction phase, it should note to collect and not dump the waste into agricultural land.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ensure safety traffic on the route.</td>
</tr>
<tr>
<td>Location</td>
<td>Sensitive Area or Activity</td>
<td>Mitigation Measures</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| Km56+900 – Km59+700 | Sparse resident area is interspersed with agricultural land.  
- People Committee of Dong Hop Commune is located on the right of the route  
- Side ditches are needed to repair and clean. | - When construction passes through residential areas, it is necessary to restrict the dust and noise, especially school area.  
- In construction phase, it should note to collect and not dump the waste into agricultural land and residential area.  
- Ensure safety traffic on the route, especially on Dong Hop Secondary School’s entrance. |
| Km59+700 – Km62+500 | The route passes through agricultural land.  
- Side ditches are needed to repair and clean. | - In construction phase, it should note to collecting and not dumping waste into agricultural land and irrigation ditches.  
- Ensure safety traffic on the route. |
| Km62+500 – Km64+000 | Sparse resident area is interspersed with agricultural land.  
- Side ditches are needed to repair and clean. | - When construction passes through residential areas, it is necessary to restrict the dust and noise, especially school area.  
- In construction phase, it should note to collect and not dump the waste into agricultural land and irrigation canal.  
- Ensure safety traffic on the route. |
| Along the road | Private businesses and utility companies that will be affected. | - Planned and unplanned interruptions to water, gas, power, internet services: the Contractor must undertake prior consultation and contingency planning with local authorities about the consequences of a particular service failure or disconnection.  
- Coordinate with relevant utility providers to establish appropriate construction schedules.  
- Provide information to affected households on working schedules as well as planned disruptions (at least 5 days in advance).  
- The contractor should ensure alternative water supply to affected residents in the event of disruptions lasting more than one day.  
- Any damages to existing utility systems of cable shall be reported to authorities and repaired. |

**Mitigation measures during operation**

<table>
<thead>
<tr>
<th>All location</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All location</td>
<td>- All vehicles must comply with the national regulations controlling allowable emission limits of exhaust</td>
</tr>
</tbody>
</table>
### Chance Find Procedures

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

- Stop the construction activities in the area of the chance find.
- Delineate the discovered site or area.
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Culture and Information takes over.
- Notify the Construction Supervision Consultant who in turn will notify responsible local or national authorities in charge of the Cultural Property of Viet Nam (within 24 hours or less).
- Relevant local or national authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values.
- Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage.
- If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relics authority, the Project’s Owner will need to make necessary design changes to accommodate the request and preserve the site.

Decisions concerning the management of the finding shall be communicated in writing by relevant authorities.

### 6. Roles and Responsibilities of Environmental Management Stakeholders

Proper environmental management during construction requires the involvement of several stakeholders and agencies, each with different roles and responsibilities including:

- Project owner: DRVN, PMU3;
- DUNREs (District Unit of Natural Resources and Environment) of the five districts (Dien Chau, Quynh Luu, Nghia Dan, Quy Hop, Thai Hoa districts) in Nghe An Province and relative agencies;
- Contractors; and local communities.

The relationship and interaction among different stakeholders in environmental management of the subproject are presented in the figure below.

![Diagram of Environmental Management System](image)

**Figure 2. Environmental Management System**

Specific responsibilities of the stakeholders are presented in Table 4 below:

**Table 4. The role of responsible stakeholder**

<table>
<thead>
<tr>
<th>No.</th>
<th>Company/Unit</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DRVN/PMU3</td>
<td>DRVN, the Project implementing agency, will be responsible for overseeing the project implementation. PMU3, representative of the DRVN, will be responsible for monitoring the overall project implementation, including environmental compliance of the project. PMU3 will have the final responsibility for environmental performance of the project during both the construction and operational...</td>
</tr>
</tbody>
</table>
Specifically PMU3 will: i) closely coordinate with local authorities in the participation of the community during project preparation and implementation; ii) monitor and supervise EMP implementation including incorporation of EMP into the detailed technical designs and bidding and contractual documents; iii) ensure that an environmental management system, as indicated in Figure 2, is set up and functions properly; iv) be in charge of reporting on EMP implementation to the DRVN and the World Bank.

In order to get effectiveness in the implementation process, PMU3 will establish an environmental unit with at least two environmental staff to help with the environmental aspects of the project.

The Environmental Unit is responsible for monitoring the implementation of WB’s environmental safeguard policies in all stages and process of the project. Specifically, this unit will be responsible for: i) reviewing the subproject EPCs(EIAs) and EMPs prepared by consultants to ensure quality of the documents; ii) helping PMU3 incorporate EMPs into the detailed technical designs and civil works bidding and contractual documents; iii) helping PMU3 incorporate responsibilities for EMP monitoring and supervision into the TORs, bidding and contractual documents for CSC and IEMC; iv) providing relevant inputs to the consultant selection process; v) reviewing reports submitted by the CSC and IEMC; vi) conducting periodic site checks; vii) advising PMU3’s leaders on solutions to environmental issues of the project; and viii) preparing environmental performance section on the progress and review reports to be submitted to the DRVN and the Bank.

The Construction Supervision consultant (CSC) will be responsible for supervising and monitoring all construction activities and for ensuring that Contractors comply with the requirements of the contracts and the EMP. The CSC shall engage sufficient number of qualified staff (e.g. Environmental Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor’s performance. The Environmental Engineers shall be led by a Workplace Safety and Environment Supervisor (SES) who shall have extensive experience (at least 5 years experience is required) in environmental management, supervision and monitoring on construction projects and be familiar with Viet Nam environmental legislatives requirements.

The terms of reference for the CSC shall be clearly stipulated in the contract signed between CSC and PMU3.

Based on the approved EMP, the Contractor will be responsible for establishing a site-specific EMP for each construction site area, submit the plan to PMU3 and CSC for review and approval before commencement of construction. In addition, it is required that the Contractor get all permissions for construction (traffic control and diversion, excavation, labor safety, etc. before civil works) following current regulations.

The contractor shall be required to appoint a competent individual as the contractor’s on-site Safety and Environment Officer (SEO) who will be responsible for monitoring the contractor’s compliance with the EMP
<table>
<thead>
<tr>
<th>No.</th>
<th>Company/Unit</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Independent Environmental Monitoring Consultant (IEMC)</td>
<td>IEMC will, under the contract scope, provide support to PMU3 to establish and operate environmental management systems, offers suggestions for adjusting and building capacity for relevant agencies during the implementation period and monitor the Contractor’s EMP implementation in both construction and operation stages. IEMC will also be responsible to support PMU3 to prepare monitoring reports on EMP implementation and submit these reports to DRVN for approval. The IEMC shall have extensive knowledge and experience in environmental monitoring and auditing to provide independent, objective and professional advice on the environmental performance of the project.</td>
</tr>
<tr>
<td>6</td>
<td>DUNREs (District Unit of Resources and Environmental Agency)</td>
<td>With the role of state management in the environmental field, DUNREs will be responsible for monitoring and management environmental issues from project implementation process in district area.</td>
</tr>
</tbody>
</table>

7. **Compliance Framework on Environmental**

7.1. **Environmental Duties of the Contractor**

The Contractor, and his sub-contractor and employees shall adhere to firstly try to minimize the impact that may be result of the project construction activities and secondly, the mitigation measures set down in these EMP to prevent harm and nuisances on local communities, impacts in construction and operation on the environment.

Remedial actions that cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works)

The duties of the Contractor and his Sub-Contractors include but not limiting to:

- Compliance with relevant legislative requirements governing the environment, public health and safety;
- Work within the scope of contractual requirements and other tender conditions;
- Organize representatives of the construction team to participate in the joint site inspections undertaken by the SES;
- Carry out any corrective actions instructed by the environmental officer of the Environmental Unit (under PMU3) or the SES;
- Provide and update information to the Environment Unit regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact;
- Stop construction activities, which generate adverse impacts upon receiving instructions from the Environmental Unit (under PMU3) or the SES. Propose and carry out corrective measures.
actions and implement alternative construction method, if required, in order to minimize the environmental impacts; Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the Environmental Unit (under PMU3).

Detailed Environmental specifications for Contractors are included in Appendix 3.

**7.2. Contractor’s Safety and Environment Officer (SEO)**

The Contractor shall be required to appoint a competent individual as the Contractor’s on-site Safety and Environment Officer (SEO). The SEO must be appropriately trained in environmental management and must possess the skills necessary to transfer environmental management knowledge to all personnel involved in the contract. The SEO will be responsible for monitoring the Contractor’s compliance with the EMP requirements and the environmental specifications. The duties of the SEO shall include but not be limited to the following:

- Carry out environmental site inspections to assess and audit the Contractors’ site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
- Monitor compliance with environmental protection measures, pollution prevention and control measures and contractual requirements;
- Monitor the implementation of environmental mitigation measures;
- Prepare audit reports for the environmental monitoring data and site environmental conditions;
- Investigate complaints and recommend any required corrective measures;
- Advise the Contractor on environment improvement, awareness and proactive pollution prevention measures;
- Follow the procedures in the EMP and recommend suitable mitigation measures to the Contractor in the case of non-compliance. Carry out additional monitoring of noncompliance within the specified timeframe instructed by the Environmental Unit (under PMU3);
- Liaison with the Contractor and environmental officer (under PMU3) on all environmental performance matters; and Contractor’s submission of EMP Implementation Plan reports to the Environmental Unit (under PMU3), SES, and relevant administrative authorities, if required;
- Keep detailed records of all site activities that may pertain to the environment.

**7.3. Environmental Supervision during Construction**

During construction, the environmental supervision shall be carried out by a qualified Construction Supervision Consultant (CSC) reporting to the PMU3. The CSC is responsible for inspecting, and supervising all construction activities to ensure that mitigation measures adopted in the EMP are properly implemented, and that the negative environmental impacts of the project are minimized. The CSC shall engage sufficient number of qualified staff (e.g. Environmental Supervision Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor’s performance.

The Environmental Engineers shall be led by a Workplace Safety and Environment Supervisor (SES) who shall have extensive knowledge and experience (at least 5 years experience is required) in environmental management, supervision and monitoring on construction projects to provide, objective and professional advice to the client on the environmental performance of the project. The SES shall be familiar with the environmental
legislative requirements of the Socialist Republic of Viet Nam. Depending on the project requirements, the SES may be required to work full-time on-site.

The SES shall:

- Review and assess on behalf of the PMU3 whether the construction design meets the requirements of the mitigation and management measures of the EPC and EMP,
- Supervise implementation of site-specific environmental management plans of Contractors including their performance, experience and handling of site environmental issues, and provide corrective instructions;
- Review the EMP implementation by the Contractors and Sub-Contractors, verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results;
- Report EMP implementation status to PMU3 and prepare the environmental supervision statement during the construction period; and
- Approve invoices or payments.

Terms of reference for the Environmental Supervision Engineers are included in Appendix 4.

7.4. Independent Environmental Monitoring Consultant (IEMC)

In order to minimize the environmental impacts during construction of the Road Project, the project proponent shall ensure that Project-specific monitoring and audit requirements are established for the project. The monitoring and audit shall be carried out by an Independent Environmental Monitoring Consultant (IEMC) appointed by PMU3. PMU3 will hire a competent firm to carry out independent environmental monitoring of all subprojects under the VRAMP project.

IEMC will be responsible for carrying out environmental sampling and monitoring twice a year, on all environmental-related issues regarding the Contractor’s works. IEMC will check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project EMP are fully complied with. He/she will also supply specialized assistance to PMU3 and the Environmental Unit of PMU3 in environmental matters.

Terms of reference for the Independent Environmental Monitoring Consultant are included in Appendix 5.

7.5. Compliance with Legal and Contractual Requirements

The constructions activities shall comply not only with contractual environmental protection and pollution control requirements but also with environmental protection and pollution control laws of the Socialist Republic of Viet Nam.

All the works method statements submitted by the Contractor to the Environmental Unit (under PMU3) for approval shall also be sent to the SES to see whether sufficient environmental protection and pollution control measures have been included.

The SES shall also review the progress and program of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating the laws can be prevented.

The Contractor(s) shall regularly copy relevant documents to the SEO and the SES. The document shall at least include the updated Work Progress Reports, the updated Works Program, and the application letters for different license/permits under the environmental
protection laws, and all the valid license/permit. The SES and the SEO shall also have access, upon request, to the Site Log-Book.

After reviewing the documents, the SEO or the SES shall advise the Environmental Unit (under PMU3) and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the SEO or the SES concludes that the current status on license/permit application and any environmental protection and pollution control preparation works may not comply with the works program or may result in potential violation of environmental protection and pollution control requirements by the works in due course, they shall advise the Contractor and the Environmental Unit (under PMU3) accordingly.

8. EMP Implementation Plan

8.1. Contractor’s EMP Implementation Plan

Prior to commencement of construction, the Contractor will be required to submit an EMP Implementation Plan to the PMU3 based on the Contractor’s actual construction methodologies, work program, and management of construction activities and management of the workforce during construction. The EMP Implementation Plan shall demonstrate compliance with Vietnamese environmental requirements, the mitigation measures set down in these specifications and The World Bank environmental policies. The content of the Contractor’s EMP shall be in line with the project specific EMP. The Plan shall be certified by the SEO and verified in accordance with the project and the EPC requirements and, approved by the SES and PMU3.

The Contractor’s EMP Implementation Plan shall provide details such as commitment to environmental protection by the Contractor’s Project Management Team; methodology of implementing the project EMP; detailed designs and installation of pollution control facilities (e.g. drainage channel, settling tank, temporary noise barrier, etc); environmental control mechanism; detailed earthworks management plans and site operation plans outlining the measures that are proposed to minimize, mitigate and manage the effects, for the duration of the construction works; and environmental monitoring program during different stages of construction period.

8.2. Project Initiation and Staffing

It is anticipated that the CSC and the SES, will be mobilized one month before the start of the construction activities. The one month start up time will be utilized by the SES to review and familiarize itself with the project, the project design, the technical specifications, contract documents, the EPC, EMP and RAP reports and other project relevant documents and reports. Following the review, the SES will prepare a brief report on the potential issues and challenges arising from the implementation of the EMP and the condition of contracts and make recommendations to the PMU3 about how best to improve the implementation of the EMP. The SES is expected to be mobilized at the beginning of the contract, to prepare the necessary guidelines, documentation, training, etc.

8.3. Capacity Building and Training

Actual implementation of projects shows that coordination in environmental management is not always effective because of the following reasons:

- Local staff do not master loans borrowing process of project but carry out practices
involving and following those of domestic projects with limited participation;

- The community does not have obvious awareness on their rights and obligations on environmental protection or in spite of understanding, there is a lack of regime to provide feedback;
- Relevant agencies were not always ready in coordinating works during project implementation. Some agencies assigned their functional staff to coordinate with the project but this assignment is only temporary and appointed staffs do not master the coordination method as well as necessary procedures for discussion and contact with PMU3.

In order to overcome these matters, it is necessary to analyze and assess the capability and demands of relevant departments/divisions in environmental management and analyze actual demands for project implementation. Accordingly, a capacity building and training program will be established to increase the effective operation of environmental management systems in the future. Some assessments on training demands in environmental management as well as proposals for a training program are presented in Appendix 6.

9. Monitoring Program

9.1. Objectives

It is essential to design the monitoring program and monitoring frequency appropriately to be able to demonstrate both the overall performance of the project works as well as the short-term impact due to peak construction activities. More specifically, as the integral and critical part of the EMP, the environment monitoring program should have the following objectives:

- Determine the actual extent of the impacts;
- Control impacts which are generated from construction process and mentioned in EPC report;
- Check environmental pollution standards applied to the project during construction;
- Check and supervise implementation of environmental protection solutions during construction based on EPC report which was registered;
- Suggest mitigation measures in case of unexpected impacts;
- Suggest to the Client to coordinate with central and local environmental organizations to solve pending issues relating to environmental protection under the scope of the Subproject;
- Assess the effect of mitigation measures in pre-construction, construction and operation stages;
- Confirm the impacts forecasted in the EPC.

9.2. Site Inspections

The SEO and the SES shall carry out a monitoring program on a daily or as needed basis at the designated monitoring locations and the regular site inspections. The monitoring program shall include:

- Monitoring of the noise level at the sensitive receptor by portable monitoring kit; the monitoring shall take place during the heavy construction activities, such as excavation, piling, power generation, material transportation and night time construction, if any and shall be conducted near villages, schools, and other sensitive receptors along the project alignment;
- Visual inspection to check the air-borne dust, during demolition, bulk material handling and storage, transportation routes near the resident areas;
- Visual inspection to check the water quality in the receiving rivers, fish ponds and lakes.
affected by the construction activity such as turbid, smell, color, etc. particular at the receiving areas of the water bodies from the construction sites and construction camps.

During the peak construction period or at the request from PMU3, once non-compliance with environmental quality performance criteria is identified, additional monitoring shall be carried out.

The SEO and the SES shall refer to the following information/documentation in conducting the inspection:

- The contractor’s environmental performance, and EMP Implementation program;
- Good practices and general environmental mitigation measures;
- Compliance with the EMP requirements, contractual specification and Vietnamese legislation;
- Protection to sensitive locations and control mechanism of the restricted areas;
- The contractor’s construction methodologies and condition of construction plant;
- Individual works methodology proposals (which shall include proposal on associated pollution control measures);
- Works progress and program;
- The adequacy and efficiency of the contractor’s pollution control measures/ treatment facilities for minimizing environmental impacts;
- Landscaping and soil erosion controls;
- Location, management and pollution control at the waste/material storage areas, borrow pits and access roads;
- Previous site inspection results.

The Contractor shall update the SEO and the SES with all relevant information of the construction contract to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works shall be timely submitted to PMU3 and the Contractor for reference and for taking immediate action.

9.3. Monitoring Indicators

The environmental monitoring program will be implemented during construction and operation process at 4 levels:

(i) Monitoring project completion Indicator
(ii) Monitoring the level of compliance with mitigation measures
(iii) Community-based Monitoring
(iv) Monitoring environmental parameters;

Details of the monitoring program proposed are presented below.

Monitoring project completion indicator

A system of monitoring indicators is proposed to assess implementation of some project stages. These monitoring indicators which represent characteristics of sub-project activities can be collected easily based on experiences obtained from similar WB funded infrastructure investment projects in Viet Nam. Based on initial objectives, the following activities will be established, including socio-economic effect, environment, and sustainable development.

These indicators will be stated in the manuals which provide guidance on project implementation. The main environmental indicators related to project investment effect
includes but not is limited by the following matters:

- Decrease in the level of pollution load on NH48 and related axis roads.
- Decrease in the level of accidents on NH48 and related axis roads.

This monitoring will be implemented after road completion. PMU3 will be responsible for collecting the information necessary to prepare periodical reports on project completion indicators with the help of a technical consultant.

**Monitoring compliance with mitigation measures**

The monitoring assignments for the Contractor, CSC shall be clearly indicated in their terms of reference and contract documents shall be approved by the World Bank. CSC will be responsible for submitting monthly reports which state environmental problems, actions and updated monitoring results. Based on monthly reports and field monitoring trips, CSC will be responsible for preparing and submitting every three months reports to PMU3, which shall include conclusions on environmental problems and the key implemented mitigation measures. Quarterly reports, prepared by PMU3, shall comprise the following aspects:

- A priority list of issues as determined in monitoring reports of the previous months.
- Methods taken by the Contractor to solve relevant.
- Pending matters, proposed solutions and explanation of special circumstances for non-compliance.

**Community-based Monitoring**

The communities will monitor the subproject during the construction process in order to ensure that the contractors will comply with all environmental and social regulations as well as to reduce the risks on the community properties and economic activities, health and the environment. The environmental specifications for contractors include a Community Relations and Communication program that will address all interactions between the Contractors and the community and allow for complaints from the communities to be addressed in a timely manner.

**Environmental quality monitoring indicators**

The environmental monitoring program will be implemented during construction stage. In addition to the daily inspections and noise monitoring to be carried out by the CSC and SEO, the IEMC will carry out periodic monitoring with sampling and laboratory analysis as shown in Table 5. Selected locations are determined based on construction progress and monitoring time.

**Table 5. Environmental Monitoring Requirements**

<table>
<thead>
<tr>
<th>No.</th>
<th>Monitoring items</th>
<th>Construction stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Monitoring noise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitoring parameter</td>
<td>Leq</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Monitoring frequency</td>
<td>Measure once every 03 months. 01 location/day, Measure twelve times /day, 3 samples/once</td>
</tr>
<tr>
<td>3.</td>
<td>Frequency of taking samples</td>
<td>5 locations x 12 x 4 x 3 x 2 years of construction (as expected)</td>
</tr>
<tr>
<td>4.</td>
<td>Standard for comparison</td>
<td>QCVN 26/ 2010/ BTNMT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Monitoring Vibration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitoring parameter</td>
<td>Laeq</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In order to exchange information effectively, establish a database for monitoring the implementation of mitigation measures, and create an effective implementation of EMP, it is essential to adopt a system of standard report at all levels of management as shown in the table below.

### Table 6. System of Environmental Monitoring Report

<table>
<thead>
<tr>
<th>No.</th>
<th>Issues to be reported</th>
<th>Monitoring at 1st level</th>
<th>Monitoring at 2nd level</th>
<th>Monitoring at 3rd level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(One duplicate must be sent to DUNREs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implemented by: Contractor</td>
<td>Implemented by: PMU3</td>
<td>Implemented by: DRVN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of report submission: Monthly</td>
<td>Frequency of report submission: once every three months</td>
<td>Frequency of report submission: once every three months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report sent to: PMU3</td>
<td>Report sent to: DRVN</td>
<td>Report sent to: MOT.</td>
</tr>
<tr>
<td>1</td>
<td>Implement mitigation measures on site in accordance with the EMP and contract clauses</td>
<td>Implemented by: Contractor</td>
<td>Implemented by: PMU3</td>
<td>Implemented by: DRVN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of report submission: Monthly</td>
<td>Frequency of report submission: once every three months</td>
<td>Frequency of report submission: once every three months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report sent to: PMU3</td>
<td>Report sent to: DRVN</td>
<td>Report sent to: MOT.</td>
</tr>
<tr>
<td>2</td>
<td>Monitoring and supervision of the EMP compliance in accordance with the contract clauses</td>
<td>Implementation Unit: Construction Supervision Team (CSC)</td>
<td>Implemented by: PMU3</td>
<td>Implemented by: DRVN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of report submission: Monthly – Quarterly</td>
<td>Frequency of report submission: once every three months</td>
<td>Frequency of report submission: once every three months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report sent to: PMU3</td>
<td>Report sent to: DRVN</td>
<td>Report sent to: MOT.</td>
</tr>
<tr>
<td>3</td>
<td>Community</td>
<td>Implemented by:</td>
<td>Implemented by:</td>
<td></td>
</tr>
</tbody>
</table>

9.4. **Monitoring Report System**

In order to exchange information effectively, establish a database for monitoring the implementation of mitigation measures, and create an effective implementation of EMP, it is essential to adopt a system of standard report at all levels of management as shown in the table below.

### III Monitoring air quality

<table>
<thead>
<tr>
<th>No.</th>
<th>Monitoring parameter</th>
<th>Frequency of taking samples</th>
<th>Monitoring frequency</th>
<th>Standard for comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monitoring parameter</td>
<td>TSP</td>
<td></td>
<td>QCVN 27/2010/ BTNMT</td>
</tr>
<tr>
<td>2</td>
<td>Monitoring frequency</td>
<td>Measure once every 03 months. 01 location/day. Measure twelve times /day</td>
<td></td>
<td>QCVN 05:2009/ BTNMT</td>
</tr>
<tr>
<td>3</td>
<td>Frequency of taking samples</td>
<td>5 locations x 12 x 4 x 3 x 2 years of construction (as expected)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Standard for comparison</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Issues to be reported</td>
<td>Monitoring at 1st level</td>
<td>Monitoring at 2nd level</td>
<td>Monitoring at 3rd level (One duplicate must be sent to DUNREs)</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------</td>
<td>-------------------------</td>
<td>-------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>monitoring of EMP implementation</td>
<td>Monitoring by communities group</td>
<td>Local authority</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of report submission: In cases of reflection/complaints.</td>
<td>Frequency of report submission: In cases of reflection/complaints.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Send report to: Local authority</td>
<td>Report sent to: PMU3</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Environment and Traffic Monitoring</td>
<td>Implemented by: Functional company of DRVN</td>
<td>Implemented by: DRVN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of report submission: once every six months</td>
<td>Frequency of report submission: once every six months</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report sent to: DRVN</td>
<td>Report sent to: MOT</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Traffic safety monitoring</td>
<td>Implemented by: Functional company of DRVN</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of report submission: once every six months</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report sent to: MOT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 9.5. Environmental Claims and Penalty System

In the compliance framework, if non-compliance with environmental regulations are discovered by IEMC/CSC during the site supervision, 2% values of interim payment of the contractor of this month will be held back. The Contractor will be given a grace period (determined by CSC) to repair the violation. If the Contractor performs the repairs within the grace period (confirmed by CSC), no penalty is incurred and keeping money will be pay for next month. However, if the Contractor fails to successfully make the necessary repairs within the grace period, the Contractor will pay the cost for a third party to repair the damages (deduction from keeping money).

In case of IEMC/CSC not detected of non-compliance with environmental regulations of the contractor, they will be responsibility payment to repair the violation.

### 10. Estimated Budget for EMP Implementation

#### 10.1. Implementation of Mitigation Measures by Contractor

The cost for organization, training, dissemination, procurement, operation of equipment, and labor for implementation of mitigation measures in and out of the site in accordance with the EMP and the subproject bidding and contractual document requirements are integrated in the construction package. Contractors will be responsible to study, prepare alternatives and offer.
cost estimation for these activities. It is considered as one of the criteria for assessing the capability of the Contractor in the future and compliance level of the Contractor.

10.2. **Supervision of EMP Implementation by CSC**

The cost for the CSC to supervise EMP implementation in accordance with the EMP and the subproject bidding and contractual documents is integrated in the contract package with the CSC. Potential bidder for this package will be responsible to study environmental management requirements of the EPC and EMP to prepare and offer cost estimation for EMP supervision during the construction. It is considered as one of the criteria for assessing the capability of the potential CSC in supervising EMP implementation.

10.3. **EMP Estimated Budget for Capacity Building and Independent Environment Monitoring**

Apart from costs, which have been calculated in relevant packages/contracts, one more cost element will be required for EMP as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Contents</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cost for Independent Monitoring Consultant</td>
<td>88,200,000</td>
</tr>
<tr>
<td>2</td>
<td>Cost for monitoring the environmental quality</td>
<td>419,556,480</td>
</tr>
<tr>
<td>3</td>
<td>Cost for capability building and training</td>
<td>56,000,000</td>
</tr>
<tr>
<td></td>
<td><strong>Sub-total</strong></td>
<td><strong>56,375,648</strong></td>
</tr>
<tr>
<td>4</td>
<td>Contingency (10%)</td>
<td>56,375,648</td>
</tr>
</tbody>
</table>

**Total** 620,132,128

Exchange Rate dated on 21 June 2013 of VCB:

1USD = 21,036.00 VND

EMP estimated budget for independent environmental monitoring and capacity building is 620,132,128 VND (29,480 USD). The above cost rate is estimated based on current unit price and Consultant’s experiences. Because the project will be implemented several years, price fluctuation will be unavoidable. A contingency amount should be prepared for any unavoidable price or cost increase during project implementation.

Detailed costs are presented in Appendix 7.

11. **Public consultation and Information disclosure**

11.1. **Objectives**

According the safeguard policy of World Bank (OP 4.01), the subproject shall organize public consultation and disclose the subproject information to local communities.

The main objectives of the public consultation and disclosure include:

- Diffusion of information on the subproject plan to the affected people and local communities.
- Collection of opinions and comments of subproject-affected-people and local communities on the subproject plan, particularly on the proposed impact mitigation
measures.

- Promotion of the active participation of subproject-affected-people and local communities into the subproject implementation from the early stage of the subproject planning.

### 11.2. Results of public consultation meetings were organized

The project owner (PMU3) has organized five (5) public consultation meetings at 5 communes in the project area (time of the meeting are present in Table 8).

#### Table 8. Time of public consultation meetings

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Locality</th>
<th>Number of participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13h – March 5, 2013</td>
<td>Nghia Xuan commune, Quy Hop district, Nghe An province</td>
<td>19</td>
</tr>
<tr>
<td>2</td>
<td>13h30’ – March 7, 2013</td>
<td>Nghia Tien commune, Thai Hoa district, Nghe An province</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>14h – March 11, 2013</td>
<td>Dien Lam commune, Dien Chau district, Nghe An province</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>15h30 – March 13, 2013</td>
<td>Quynh Chau commune, Quynh Luu district, Nghe An province</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>08h – March 14, 2013</td>
<td>Nghia Tan commune, Nghia Dan district, Nghe An province</td>
<td>19</td>
</tr>
</tbody>
</table>

After listening to the representative of Project side introducing main item of Project the participants put forward many comment as well as contributions to Project side, mainly focusing on the issues as follows:

- It needs to have measures to mitigate the impacts during construction stage (e.g. impacts on noise, vibration, dust etc.).
- Recommend the Contractor (or Project owner) have to coordinate with local authorities to solve the arising issues during construction stage.
- It needs to timely construct, don’t affect on life of people.
- It needs to disclosure project information to communities and people.
- Ensuring the traffic on the NH48 and local road during construction stage.
- It needs to have the measures to prevent the forest fire risk at the pine hill areas in dry season.
- Coordinating with local authorities to research the disposal areas to ensure do not impact on communities.
- Etc.

In additional, the project owner and socio-environmental experts have conducted the interview with local people by questionnaire forms.

- Most affected households known information of the project through various sources: from the local authority, from radios and from others.
- Environmental status: Almost local people living along the road side of NH48 are affected by noise, vibration caused by the vehicles, not affected by water pollution. Due to large traffic density, the accident usually occurs on this road.
- Positive impact of Project: The project contributes to regional economic development, increasing business opportunities during construction and operation phase.
- Negative impact of Project: Almost interviewed households said that the construction
process will affect the socio-economic and natural environment due to dust, noise and vibration generated from machinery. Local people proposed Project side to early deploy and apply measures to minimize the negative impact.

- Mitigation measures of Project: Almost households agree with the mitigation measures which proposed by Project as: spraying water to prevent dust, using canvas cover to prevent dust generated by material transportation. They proposed the project and the construction units should coordinate with the police to regulate the traffic, put the sign under construction.

- Other issue: Some households want the project to thoroughly survey the existing drainage system on NH48 to avoid flooding.

11.3. Disclosure of the EMP

The EMP in Vietnamese will be disclosed in the country at PMU3, as well as in the seventeen (17) communes of the five (5) districts of Nghe An provinces.

The EMP copies in Vietnamese and English will be sent to the Vietnam Development Information Center at 63 Ly Thai To street, Hanoi City for disclosure of information. The EMP copies in English will also be disclosed in the Infoshop of the World Bank.
Appendices

Appendix 1. Environmental standard and regulations

Standards and regulations on water environment
- QCVN 09: 2008/BTNMT - National technical regulation on underground water quality;
- QCVN 08: 2008/BTNMT - National technical regulation on surface water quality;

Standards and regulations on air environment
- QCVN05:2009/BTNMT. National technical regulation on ambient air quality;
- QCVN06:2009/BTNMT. National technical regulation on hazardous substance in ambient air.

Standards on solid waste
- QCVN 07:2009/BTNMT The national technical regulation on hazardous waste thresholds;
- TCVN 6707:2009 - Prevention and warning signs for hazardous waste;
- TCVN 6705:2009 - Non-hazardous waste;

Standards and regulations on soil environment and sediment
- QCVNO3:2008/BTNMT, National technical regulation on the allowable limits of heavy metals in the soils;
- QCVN 43:2012/BTNMT, National Technical Regulation on Sediment Quality

Standards and regulations on noise and vibration
- QCVN26:2010/BTNMT, National technical regulation on noise;
- TCVN7210:2002, Vibration and shock – Vibration caused by construction works and factories – Maximum permitted levels in the environment of public and residential areas.

Standards on labor sanitation
- Decision No. 3733/2002/QD-BYT dated 10th October 2002 issued by Heath Care Department on application of 21 standards on labor sanitation

Safety standards and regulations for construction:
- Decision No. 955/1998/QD-BLDTBXH: regulations on labor safety
Appendix 2. Specific Impacts, Location and Proposed Mitigation Measures for each Route Segment

CURRENT STATUS
- The beginning section of route passes through residential area of Yen Ly Commune. The remaining section passes through sparsely resident area; mainly is agricultural land with rice and corn.
- Culvert and side ditch are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential area of Yen Ly Commune and Quynh Luu No.1 High School, it is necessary to restrict the dust and noise.
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- Ensure safety traffic on the route, especially at intersection of starting point and Quynh Luu No.1 High School’s entrance.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be establishes to avoid flooding.
CURRENT STATUS
- Section Km1+650 ÷ Km2+500: Resident is living along the route. The remaining section passes through sparsely residential area, mainly is agricultural land with rice, corn and acacia.
- A small river cut the route at Km1+700.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas at section Km1+650 ÷ Km2+500, it is necessary to restrict the dust and noise.
- In construction phase, it should note to collect and not dump the waste into the surface water resource at Km1+700 and agricultural land.
- Ensure safety traffic on the route.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- The route pass through sparsely residential area, mainly is agricultural land with corn and acacia.
- Small group of resident living at Km5+400
- Four culverts are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential area at Km5+400, it is necessary to restrict the dust and noise.
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- Ensure safety traffic on the route.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be establishes to avoid flooding.
CURRENT STATUS
- The residents of Dien Lam Commune are living along the route, interspersed with agricultural land.
- Dien Lam Secondary School and People Committee of Dien Lam Commune are located at Km6+800.
- Culverts and side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PROGRESS
- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school and People Committee of Dien Lam Commune.
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- Ensure safety traffic on the route, especially on time when the pupils leave Dien Lam Secondary School.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- The residents of Dien Lam Commune are living along the route at Km7+800 and Km9+500. The remaining section passes through agricultural land.
- Dien Lam No.2 Secondary School is located at Km9+500.
- Culverts and side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school area.
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- Ensure safety traffic on the route, especially on time when pupil leave Dien Lam No.2 Secondary School.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- Pagoda at Km10+250 and church at Km10+950
- Irrigation ditch on the left of route
- Culverts are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through pagoda and church area, it is necessary to restrict the dust and noise, especially on festival days.
- In construction phase, it should note to collect and not dump the waste, especially oil waste, into agricultural land and irrigation ditch along the route.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- The route passes through agricultural land.
- Culverts are needed to repair and clean

ATTENTION IN CONSTRUCTION PHASE
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- Quynh Luu No.4 High School is located at Km16+500.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential area, especially Quynh Luu No.4 High School, it is necessary to restrict the dust and noise.
- In construction stage, it should note to collecting and not dumping waste, into agricultural land.
- Ensure safety traffic on the route, especially on time when the pupils leave Quynh Luu No.4 High School.
CURRENT STATUS
- The residents of Quynh Chau Commune are living along the route, interspersed with agricultural land.
- People Committee of Quynh Chau Commune (Km16+800) and Quynh Chau Primary School with 60m distance from the route.
- Culverts are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, especially Quynh Chau Primary School, it is necessary to restrict the dust and noise.
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- Ensure safety traffic on the route, especially on time when the pupils leave Quynh Chau Primary School.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- The route passes through agricultural land with acacia and eucalyptus.
- Side ditches are needed to repair and clean

ATTENTION IN CONSTRUCTION PHASE
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- People Committee of Nghia Tien Commune (Km40+800) and People Committee of Nghia Tan Commune (Km41+000) area located on the left of the route.
- Side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at school area.
- In construction phase, it should note to collect and not dump the waste into agricultural land and residential area.
- Ensure safety traffic on the route.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be establishes to avoid flooding.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- People Committee of Nghia Lien Commune (Km42+000) is located on the left of the route.
- Side ditches are needed to repair and clean

ATTENTION IN CONSTRUCTION PROGRESS
- When construction passes through residential areas, it is necessary to restrict the dust and noise.
- In construction phase, it should note to collect and not dump the waste into agricultural land and residential area.
- Ensure safety traffic on the route.
- A reasonable plan for repairing and cleaning of culverts and side ditches will be established to avoid flooding.
CURRENT STATUS
- The route passes through concentration residential area.
- People Committee of Nghia Hieu Commune is located on the left of the route (Km 45+500), and Nghia Xuan No.1 Primary School is located on the right of the route (Km 47+600).

ATTENTION IN CONSTRUCTION PHASE
- When construction pass through residential areas, especially are nearby Nghia Xuan No.1 Primary School, it is necessary to restrict the dust and noise.
- In construction stage, it should note to collecting and not dumping waste into residential area and agricultural land.
- Ensure safety traffic on the route, especially school’s entrance.
CURRENT STATUS
- The route passes through agricultural land with acacia and eucalyptus.
- Side ditches are needed to repair and clean

ATTENTION IN CONSTRUCTION PHASE
- In construction phase, it should note to collect and not dump the waste into agricultural land.
- Ensure safety traffic on the route.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- Two rivers cut the route at Tong Hop and Dinh Bridge.
- People Committee of Nghia Xuan Commune (Km52+700) is located on the left of the route.
- Side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially at area nearby People Committee of Nghia Xuan Commune.
- In construction phase, it should note to collect and not dump the waste into agricultural land as well as surface water resource in the rivers.
- Ensure safety traffic on the route.
CURRENT STATUS
- The route passes through sparsely residential areas.
- Side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, it is necessary to restrict dust and noise.
- In construction phases, it should note to collect and not dump waste into agricultural land.
- Ensure safety traffic on the route.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- People Committee of Dong Hop Commune is located on the right of the route.
- Side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially school area.
- In construction phase, it should note to collect and not dump the waste into agricultural land and residential area.
- Ensure safety traffic on the route, especially on Dong Hop Secondary School’s entrance.
CURRENT STATUS
- The route passes through agricultural land.
- Side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- In construction phase, it should not collect and not dumping waste into agricultural land and irrigation ditches.
- Ensure safety traffic on the route.
CURRENT STATUS
- Sparse resident area is interspersed with agricultural land.
- Side ditches are needed to repair and clean.

ATTENTION IN CONSTRUCTION PHASE
- When construction passes through residential areas, it is necessary to restrict the dust and noise, especially school area.
- In construction phase, it should note to collect and not dump the waste into agricultural land and irrigation canal.
- Ensure safety traffic on the route.
Appendix 3: Environmental and Social Specifications for Contractors

The following are the environmental and social specifications that must be included in both the bidding documents and construction contracts to ensure an adequate management of environmental and social issues during all the phases of the road project. However, this information is intended solely as broad guidance to be used in conjunction with local and national regulations.

The Contractor and his employees shall adhere to the mitigation measures set down in:

- The Environmental Management Plan of the NH48 including site specific measures identified in Table 3 and Appendix 2 of EMP;
- The mitigation measures included in project design and bill of quantities;
- The specifications, procedures, and best practices included in these specifications. These specifications complement any technical specifications included in the work quantities and the requirements of any Vietnamese regulations and standards.

WORKFORCE AND SITE MANAGEMENT PLAN

Workforce
Site installation
Prohibitions
Environmental Training for Construction Workers

CONSTRUCTION IMPACT MANAGEMENT PLAN

Emissions and Dust
Noise and Vibration
Earthworks, Cut and Fill Slopes
Disposal of Debris
Demolition of Existing Infrastructures

WASTE MANAGEMENT PLAN

Drainage System
Solid Waste
Hazardous Waste

MATERIALS HANDLING, USE AND STORAGE MANAGEMENT PLAN

Transportation
Hazardous Substances
Surfacing Materials
Cement and Concrete Batching
Maintenance of Construction Equipment

ECOLOGICAL MANAGEMENT PLAN

Protection of Natural Vegetation
Protection of Fauna

SAFETY MANAGEMENT PLAN
Construction Site Safety
Fire Control
Traffic Management
Environmental Emergency Procedures

COMMUNITY RELATIONS AND HEALTH MANAGEMENT PLAN

Community Relations
Health Management Plan

The details of these plans are as follows:

WORKFORCE AND SITE INSTALLATION MANAGEMENT PLAN

Workforce

Workforce includes all personnel hire by the Contractors to work in the constructions, rehabilitation or improvement of roads. The workers shall, whenever possible, rent houses nearby.

The Contractors shall:

- Give priority to hire local labor for the works;
- Engineers and workers shall register their temporary residence with the local authority;
- Provide work safety training to those local labors upon their hiring;
- The construction workers and staff shall need to have appropriate certificates as required (for example, health checks, labor contracts, insurance, occupational safety training, etc);
- Provide education classes on HIV and sexually transmitted diseases.
- Establish a Code of Conduct to outline the importance of appropriate behavior, drug and alcohol abuse, respect for local communities, and compliance with relevant laws and regulations. Each employee shall be informed of The Code of Conduct and bound by it while in the employment of the PMU3 or its Contractors;
- The Code of Conduct shall address issues such as the prohibition to possess illegal substances, fire arms, pornographic materials, gambling, disturbances in or near communities, etc. Failure to follow the Code of Conduct should result in disciplinary actions;
- Ensure adequate use of resources and proper waste management.

Site Installation

In order to minimize adverse environmental impacts due to construction and location of areas/facilities for the complexion of the project, the following measures should be put into place:

- To the extent possible, the project shall utilize the existing mixing stations and asphalt plants of local area;
- The workforce shall be provided with safe, suitable and comfortable accommodations. They have to be maintained in clean and sanitary conditions;
- A medical and first aid facilities and first aid boxes shall be provided for all workers.

Prohibitions

The following activities are prohibited on or near the project site:
• Cutting of trees for any reason outside the approved construction area;
• Hunting, fishing, wildlife capture, or plant collection;
• Buying of wild animals for food;
• Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
• Disturbance to anything with architectural or historical value;
• Building of fires;
• Use of firearms (except authorized security guards);
• Use of alcohol by workers in office hours;
• Washing cars or machinery in streams or creeks;
• Doing maintenance (change of oils and filters) of cars and equipment outside authorized areas:
• Disposing trash in unauthorized places;
• Driving in an unsafe manner in local roads;
• Having caged wild animals (especially birds) in camps;
• Working without safety equipment (including boots and helmets);
• Creating nuisances and disturbances in or near communities;
• The use of rivers and streams for washing clothes;
• Indiscriminate disposal of rubbish or construction wastes or rubble;
• Littering the site;
• Spillage of potential pollutants, such as petroleum products;
• Collection of firewood;
• Poaching of any description;
• Explosive and chemical fishing;
• Burning of wastes and/or cleared vegetation.

Any construction worker, office staff, Contractor’s employees, the PMU3’s employees or any other person related to the project found violating these prohibitions will be subject to disciplinary actions that can range from a simple reprimand to termination of his/her employment depending on the seriousness of the violation.

**Environmental Training for Construction Workers**

The Contractor shall prepare an Environmental Training Plan for all construction workers and staff to ensure that all concerned staff is aware of the relevant environmental requirements as stipulated in the Vietnamese environmental legislation and the Contract specifications.

- The Contractor shall distribute to the key staff, including newly joined key staff members, (1) the Contractor’s Environmental Policy; and (2) Copies of relevant extracts from environmental laws, standards and regulations.
- The Contractor is responsible for providing appropriate training to all staff according to their level of responsibility for environmental matters. Managerial staff shall receive additional training.
- All Contractor’s employees shall be required to comply with environmental protection procedures and they shall be able to provide evidence that they attended the training sessions detailed in the Plan;
- Training materials and methods - which shall include formal training sessions, posters, data in newsletters, signs in construction area and ‘tool box’ meetings - shall be reviewed by the SES and submitted to the PMU3 for approval.
- The Plan shall educate all construction workers on the following issues but not limited to them: fire arm possession, traffic regulations, illegal logging and collection of non-timber forestry products, non-disturbance of resettlement communities, hunting and fishing restrictions, waste management, erosion control, health and safety issues, all
prohibited activities, the Code of Conduct requirements and disciplinary procedures, general information on the environment in which they will be working and living; and establishment of penalties for those who violate the rules;

- Periodic training shall be provided when necessary.
- Records shall be maintained (e.g. attendance records for environmental awareness training, topics covered) and submitted to the PMU3 upon request.

CONSTRUCTION IMPACT MANAGEMENT PLAN

Emissions and Dust

In order to ensure that the generation of dust due to the constructions activities is minimized, the following activities should be put into place:

- The Contractor shall be responsible for compliance with relevant Vietnamese legislation with respect to ambient air quality;
- The Contractor shall ensure that the generation of dust is minimized and shall implement a dust control program to maintain a safe working environment, minimize nuisance for surrounding residential areas / dwellings and protect damage to natural vegetation, crops, etc;
- The Contractor shall implement dust suppression measures (e.g. water spray vehicles, covering of material stockpiles, etc.) if and when required;
- Construction vehicles shall comply with speed limits and haul distances shall be minimized;
- It is encouraged to use vehicles and machinery which would cause less pollution like gasoline without lead. Limit the use of materials which may have high risk of pollution such as coal and black oil;
- Transport and construction vehicles shall abide by the Standard TCVN 6438-2005 with respect to maximum exhaust fumes allowed;
- Material loads shall be suitably covered and secured during transportation to prevent the scattering of soil, sand, materials or dust.

Noise and Vibration

To minimize noise and vibration during construction, the Contractor shall:

- Be responsible for compliance with the relevant Vietnamese legislation with respect to noise;
- Ensure that all instruments, machinery and construction equipment meet quality standards before they are put into use;
- Try to keep noise generating activities to a minimum;
- Restrict all operations that result in undue noise disturbance to local communities and/or dwellings to daylight hours on weekdays or as agreed with the Environmental Officer of PMU3;
- Use temporary noise barriers to minimize the noise caused by the construction equipment;
- Provide ear pieces to workers who must work with highly noisy machines such as piling, explosion, mixing, etc., for noise control and workers protection
- Maintain the construction equipment in its best operating conditions and lowest noise levels possible;
- In sensitive areas (including residential neighborhoods, hospitals, rest homes, schools, etc.) more strict measures may need to be implemented to prevent undesirable noise levels;
- To the extent possible, nighttime operations shall be kept to a minimum and banned
near sensitive receptors;

**Earthworks, Cuts and Fill Slopes**

Earthworks, cuts and fill slopes shall be carefully managed to minimize negative impacts on the environment

- All earthworks shall be properly controlled, especially during the rainy season.
- The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works.
- Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the EO.
- Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the SEO or SES and to the satisfaction of the EO.

**Disposal of Debris**

The Contractor shall carry out the following activities:

- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for debris;
- Debris generated due to the dismantling of existing structures shall be suitably reused, to the extent feasible, in the proposed rehabilitation program. The disposal of remaining debris shall be carried out only at sites identified and approved by the EO. The contractor should ensure that these sites (a) are not located within designated forest or cultivated areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas.
- In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such debris or silt and restore the affected area to its original state to the satisfaction of the EO.
- Water courses shall be cleared of debris and drains and culverts checked for clear flow paths;
- Include provisions for incorporating the most appropriate stabilization techniques for each disposal site and determine that the selected spoil disposal sites do not cause unwanted surface drainage;
- Assess risk of any potential impact regarding leaching of spoil material on surface water;
- Once the job is completed, all rehabilitation-generated debris should be removed from the site.

**Demolition of Existing Infrastructures**

The following measures shall be implemented in order to protect workers and the public from falling debris and flying objects:

- Set aside a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels;
- Conduct sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable;
- Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap;
- Provide all workers with safety glasses with side shields, face shields, hard hats, and safety shoes.
WASTE MANAGEMENT PLAN

During the construction stage, the Contractor shall prepare a Waste Management Plan before commencement of project works. The Plan shall include the following Sub-Plans:

Wastewater

- The Contractor shall be responsible for compliance with the relevant Vietnamese legislation relevant to wastewater discharges into watercourses;
- The Contractor shall submit a method statement to the EO detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included;
- Runoff from fuel depots/workshops/machinery washing areas and concrete batching areas shall be collected into a conservancy tank and disposed off at a site approved by the EO or SES;
- Wastewater shall not be disposed in watercourses without treatment.

Solid waste

- The Contractor shall submit a method statement detailing a solid waste control system to the EO for approval.
- The Contractor shall ensure that all facilities are maintained in a neat and tidy condition and the site shall be kept free of litter;
- Measures shall be taken to reduce the potential for litter and negligent behavior with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities for later disposal;
- Solid waste may be temporarily stored on site in a designated area approved by the EO prior to collection and disposal as regulation.
- No burning, on-site burying or dumping of waste shall occur;
- Random disposal of solid waste in scenery areas shall be strictly prohibited.

Hazardous waste

- All hazardous waste shall be disposed of at an approved hazardous landfill site and in accordance with local legislative requirements. The Contractor shall provide disposal certificates to the EO;
- The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained workers;
- Used oil and grease shall be removed from site and sold to an approved used oil recycling company;
- Under no circumstances shall the spoiling of tar or bituminous products be allowed on the site, over embankments or any burying;
- Unused or rejected tar or bituminous products shall be returned to the supplier’s production plant;
- Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company for disposal at an approved hazardous waste site.
- Inform the EO of any accidental spill or incident;
- Initiate a remedial action following any spill or incident;
- Provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions.

MATERIALS HANDLING, USE AND STORAGE MANAGEMENT PLAN
Environmental considerations shall be taken into account in the location of any material storage areas.

**Transportation**

- The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g. restricted areas);
- Material shall be appropriately secured to ensure safe passage between destinations during transportation;
- Loads shall have appropriate cover to prevent them spilling from the vehicle during transit;
- The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

**Hazardous Substances**

The Contractor shall provide a method statement detailing the hazardous substances / material that are to be used during construction, as well as the storage, handling, and disposal procedures for each substance / material and emergency procedures in the event of misuse or spillage that might negatively affect the environment. In general terms, the following activities shall be carried out:

- Make the Hazardous Waste Management Plan available to all persons involved in operations and transport activities
- All hazardous material / substances shall be stored on site only under controlled conditions;
- All hazardous material / substances shall be stored in a secured, appointed area that is fenced and has restricted entry. All storage shall take place using suitable containers to the approval of the EO;
- Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure;
- Fuel shall be stored in a steel tank supplied and maintained by the fuel suppliers. The tank shall be located in a secure, demarcated area.

**Surfacing Materials**

- Over-spray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using a method approved by the SES;
- When heating of bitumen products, the Contractor shall take appropriate fire control measures; Stone chip / gravel excess shall not be left on road / paved area verges. This shall be swept /raked into piles and removed to an area approved by the SES;
- Water quality from runoff from any fresh bitumen surfaces shall be monitored by the SES and remedial actions taken where necessary.

**Cement and Concrete Batching**

- Concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces to the satisfaction of the SES;
- All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at a site approved by the SES;
- Unused cement bags shall be stored out of the rain where runoff won’t affect it;
- Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system;
• All excess concrete shall be removed from site on completion of concrete works and disposed of washing of the excess into the ground is not allowed. All excess aggregate shall also be removed.

**Maintenance of Construction Equipment**

The Contractor shall:

• Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands). Fuel storage shall be located in proper areas and approved by the EO;
• Ensure that all instruments, machines, and construction equipment meet quality standards before they are put into use;
• Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.
• All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 300m from all cross drainage structures and important water bodies or as directed by the EO.

**ECOLOGICAL MANAGEMENT PLAN**

**Protection of Natural Vegetation**

• The Contractor shall be responsible for informing all employees about the need to prevent any harmful effects on natural vegetation on or around the rehabilitation site as a result of their activities;
• Clearing of natural vegetation shall be kept to a minimum.
• The removal, damage and disturbance of natural vegetation without the written approval of the EO are prohibited;
• The use of herbicides shall be approved by the EO;
• Regularly check the work site boundaries to ensure that they are not exceeded and that no damage occurs to surrounding areas;
• Prohibit and prevent open fires during upgrading/rehabilitation and provide temporary firefighting equipment in the work areas, particularly close to forest areas;

**Protection of Fauna**

• The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place.
• The feeding of any wild animals shall be prohibited;
• The use of pesticides shall be approved by the EO;
• No domestic pets or livestock shall be permitted on site.

**SAFETY MANAGEMENT PLAN**

**Construction Site Safety**

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

• Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed boots, etc..) for construction workers and enforce their use;
During heavy rains, accidents, or emergencies of any kind, suspend all work;
- Brace electrical and mechanical equipment to withstand seismic events during the construction;
- Establish safe sight distance in construction areas;
- Limit the speed of vehicles moving within the construction site;
- Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. All signs shall be constructed according to Vietnamese specifications;
- Provide post Material Safety Data Sheets for each chemical present on the worksite;
- Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant;
- Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers;

**Fire Control**

- The Contractor shall submit a fire control and fire emergency method statement to the EO for approval. The method statement shall detail the procedures to be followed in the event of fire;
- The contractor shall take all reasonable steps to avoid increasing the risk of fire through activities on site;
- The contractor shall ensure that basic fire-fighting equipment is available at all camp areas and facilities;
- The contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire;
- The contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire;
- Any work that requires the use of fire may only take place at a designated area approved by the EO and must be supervised at all times. Fire-fighting equipment shall be available.

**Traffic Management**

The Contractor shall:

- Estimate maximum concentration of traffic (number of vehicles/hour);
- Construction vehicles shall comply with speed limits;
- Use selected routes to the project site, as agreed with the EO, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes;
- Maintain adequate traffic control measures throughout the duration of the construction activities and such measures shall be subject to prior approval of the EO;
- Promote and disseminate traffic safety information to local residents;
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- Ensure traffic safety at intersections, especially near sensitive areas (schools, markets, hospitals, and historical, cultural and religious places);
- Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
- Use signs and flagmen for traffic control;
- Materials leaving or entering the construction site shall be transported during non-peak
hours in order to minimize traffic noise due to the increase in traffic volume;

**Environmental Emergency Procedures**

Environmental Emergency procedures are unforeseen events that can occur during the construction or rehabilitation of a road. The Contractor shall be prepared to take any necessary measures to solve such emergencies on a case-by-case basis. Events related to adverse weather conditions shall be addressed as part of the Contractor’s Safety Plan, which shall be submitted to the EO before commencement of project construction works.

The following environmental emergency procedures shall be implemented during the construction of the Road:

- Training shall be provided to all construction workers and site staff to ensure that they are fully aware of the various possible emergency situations in construction activities, the danger and potential damages caused by the emergency to the environment and the people, as well as the emergency response procedures to be followed;
- If explosive materials are detected during the clearing of construction areas, earthwork movements, or any other construction activity, the Contractor shall secure the area and inform the local authorities immediately, which in turn shall contact the local army unit for support;
- If a person identifies a leakage/spillage, she/he shall immediately check if anyone is injured and shall then inform the Contractor, the SEO and SES;
- The Contractor shall ensure any injured persons are treated and assess what has been spilled/leaked;
- If the accidents/incidents generate serious environmental pollution or the SEO or the SES consider that the incident has the potential of resulting in serious environmental pollution problems (eg. spillage/leakage of toxic or chemicals, large scale spillage/leakage, or spillage/leakage into the nearby water bodies which are used for irrigation/portable water), the SES or SEO shall inform the EO immediately.
  - In such cases, the Contractor shall take immediate action to stop the spillage / leakage and divert the spilled / leaked liquid to a nearby non-sensitive areas;
  - The Contractor shall arrange maintenance staff with appropriate protective clothing to clean up the chemicals/chemical waste. This may be achieved through soaking with sawdust (if the quantity of spillage/leakage is small), or sand bags (if the quantity is large); and/or using a shovel to remove the topsoil (if the spillage/leakage occurs on bare ground); and
  - Depending on the nature and extent of the chemical spill, evacuation of the activity site may be necessary.
  - Spilled chemicals must not be flushed to local surface drainage systems. Instead, sawdust or sandbags used for clean-up and removed contaminated soil shall be disposed of by following the procedures for chemical waste handling and disposal already described.
  - The Contractor(s) shall prepare and present a report to the EO on the incident detailing the accident, clean-up actions taken, any pollution problems and suggested measures to prevent similar accidents from happening again in future.

**COMMUNITY RELATIONS AND HEALTH MANAGEMENT PLAN**

**Community Relations**

The Contractor shall:

- Maintain open communications between the local government and concerned communities;
- Have a mailing list to include agencies, organization, and residents that are interest in the project;
- Disseminate project information to affected parties through community meetings before construction commencement;
- Provide a list of community relations contact from whom interested parties can receive information on site activities, project status and project implementation results;
- Provide all information, especially technical findings, in a language that is understandable to the general public and in a form of useful to interested citizens and elected officials through the preparation of fact sheets and news release, when major findings become available during project phase;
- Monitor community concerns and information requirements as the project progresses;
- Respond to telephone inquiries and written correspondence in a timely and accurate manner;
- Inform local residents about construction and work schedules, interruption of services, traffic detour routes and provisional as appropriate;
- Provide technical documents and drawings to PC’s community, especially a sketch of the construction area and the EMP of the construction site;
- Notification boards shall be erected at all construction sites providing information about the project, as well as contact information about the site managers, environmental staff, health and safety staff, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions;
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures;

Health Management Plan

The Contractor shall prepare and enforce a Health Management Plan to address matters regarding the health and wellbeing of construction workers, project staff and nearby communities. The Contractor shall include in his proposal the outline of the Health Plan. The EO will issue a certificate of compliance to the Contractor prior to the initiation of Construction. The Contractor shall:

- Implement a vaccination program including but not limited to vaccination against yellow fever, hepatitis A and B, tetanus, polio, etc.
- Provide periodical health check to construction workers to ensure their health and well being.
- Provide appropriate information and education to the workforce on basic personal hygiene, prevention of diseases, including respiratory diseases, vector-borne diseases such as malaria and dengue, water and food borne diseases such as diarrhea, tuberculosis, etc;
- Implement preventive measures against malaria, if applicable.
- Ensure correct maintenance of water source to prevent the breeding of mosquitoes.
Appendix 4: Environmental Supervision for the Periodic Preservation of NH48

*(to be included in the scope of works for the Construction Supervision Consultant)*

**General**

In order to prevent harm and nuisances on local communities, and to minimize the impacts on the environment during the construction and operation of NH48, the following documents have been prepared which should be adhered to by all Contractors and his employees:

- The Environmental Protection Commitment (EPC) for NH48;
- The Environmental Management Plan (EMP) of NH48 including site specific measures identified in Table 3 and Appendix 2 of the EMP;
- The mitigation measures included in project design and bill of quantities;
- The specifications, procedures, and best practices included in the EMP. These specifications complement any technical specifications included in the work quantities and the requirements of any Vietnamese regulations and standards;

**Objective of the Assignment**

The Consultant is to provide professional technical services ("the Services") to help ensure effective implementation of the Environmental Management Plan (EMP), mitigation measures included in the Information Page, and the Environmental Specifications during the construction of NH48 (the Road).

In order to achieve the goal of minimizing the negative environmental impacts of the project, the EMP has been integrated in the design of the Road, and in the technical specifications and contract documents. It will need to be closely followed and implemented by the contractors. The implementation of the EMP will therefore involve three parties:

- The Contractor’s Workplace Safety and Environment Officer (SEO) responsible for implementing the EMP and other construction related environmental and safety issues;
- The Construction Supervision Consultant (CSC) who are responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSC will include Environmental Engineers led by a Workplace Safety and Environment Supervisor (SES).
- A Client’s Independent Environmental Monitoring Consultant (IEMC), who will carry out environmental monitoring, on all environmental-related issues regarding the contractor’s works. The Client’s IEMC will check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project EMP are fully complied with. They will also supply specialized assistance to the client in environmental matters.

**Scope of Services:**

The general services to be provided by the SES are to inspect, monitor and audit the construction activities to ensure that mitigation measures adopted in the EMP are properly implemented, and that the negative environmental impacts of the project are minimized.

The Contractor has the responsibility for ensuring compliance with the project EMP and contract conditions while undertaking the works. This is overseen by the SES. The SES is therefore to be an independent monitor to ensure compliance with the EMP and to ensure adequate performance of the Contractors on environmental issues.
The SES will inspect, monitor and carry out environmental review of all road and bridge contracts packages and lots. The SES shall have extensive knowledge and experience in environmental supervision, monitoring and auditing to provide independent, objective and professional advice to the client on the environmental performance of the project. The SES team leader shall be familiar with the project works through review of the relevant reports, including the EPC, EMP as well as project technical specifications and contract documents.

As part of the CSC, the SES is expected to perform the following duties:

**Phase I: Preparation**

The objective of Phase I is to lay the groundwork for the successful execution of the project. In this phase, the SES shall: (i) review the EPC, EMP, project designs and technical specifications and confirm that there have been no major omissions of mitigation measures; (ii) prepare guides for contractors on implementing the EMP; and, (iv) develop and execute a training program for all involved in construction activities.

The main tasks in this phase are:

- **Review of Project Documents**: The SES shall review the EPC, EMP, project designs and technical specifications and confirm in writing that there have been no major omissions of mitigation measures. If any issues are identified, the SES shall propose to the PMU3 updates to the EMP and the design and technical specifications to address these issues. Once approved by PMU3, the SES shall update the EMP.

- **Environmental Supervision Checklist**: The SES shall establish a comprehensive checklist which will be used during the construction of the project to monitor the contractor’s performance. This shall cover major aspects of the project, required mitigation/control measures and their implementation schedule.

- **Log-Book**: The SES shall keep a log-book of each and every circumstance or change of circumstances which may affect the environmental impact assessment and non-compliance with the recommendations made by the SES to remediate the non-compliance. The log-book shall be kept readily available for inspection by all persons assisting in the supervision of the implementation of the recommendations of the EPC and Contract. The CSC shall verify the log-book as part of his environmental audit.

- **Environmental Training**: The SES shall design and execute a comprehensive training program for all actors: Supervision Engineers, EO of PMU3, PMU3, Contractor’s SEOs (and workers as part of the trainings given to the SEO), on the environmental requirements of the project, and how they will be supervised, monitored and audited, giving particular attention to:

  - EMP: The requirements of the EMP, the agreed environmental monitoring checklist, the environmental monitoring form, how non-compliance with the EMP will be handled, and all other key issues shall be covered. Particular attention will be paid to the specific provisions in each contract’s technical specifications indicating how the EMP is to be complied with;
  - Health and Safety: The health and safety requirements of the project shall be clearly identified and communicated with the Contractors and PMU3 (included in environmental specifications for contractors).

At the conclusion of the training Contractors will also sign a statement acknowledging their awareness of the environmental regulations, the EMP, the compliance framework, and health and safety obligations. The CSC shall sign a similar statement confirming their understanding of the supervision responsibilities.
Phase II: Supervision of Construction Activities

On behalf of the PMU3 and the Chief Supervision Engineer, the SES will:

- Review, and inspect in an independent, objective and professional manner in all aspects of the implementation of the EMP;
- Carry out random monitoring checks, and review on records prepared by the Contractor’s SEO;
- Conduct regular site inspections;
- Review the status of implementation of environmental protection measures against the EMP and contract documents;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- As needed, review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions. Where necessary, the SES shall seek and recommend the least environmental impact alternative in consultation with the designer, the Contractor(s), and PMU3;
- Verify the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures; and
- Provide regular feedback audit results to PMU3 and CSC according to the procedures of non-compliance in the EMP;
- Provide training programs, including CSC and PMU3 staff, to appraise them of issues identified and how to improve environmental compliance;
- Instruct the Contractor(s) to take remedial actions within a specified timeframe, and carry out additional monitoring, if required, according to the contractual requirements and procedures in the event of non-compliances or complaints;
- Instruct the Contractor(s) to take actions to reduce impacts and follow the required EMP procedures in case of non-compliance / discrepancies identified;
- Instruct the Contractor(s) to stop activities which generate adverse impacts, and/or when the Contractor(s) fails to implement the EMP requirements / remedial actions instructed by the SES.

Review of Site Plans: To ensure consistency across the project, the SES shall provide the final review of all site plans which may affect the environment. These include, but are not limited to: borrow pit and disposal sites plans. The SES will review and approve the EMP Implementation Plan and Landscape Implementation Plan presented by the Contractors. Where these plans are found not to comply with the EMP, EPC, the SES shall work with the CSC and Contractor to establish a suitable solution.

Health and Safety: To ensure consistency across the project, the SES shall provide the final review and recommend clearance of all Contractors’ Safety Plans, and, based on these, with inputs from the CSC, the Contractor shall prepare an overall Subproject Safety Plan (PSP). The PSP shall include procedures such as management of explosions, safety during construction, the prevention of slope slide / soil erosion during the rainfall season, etc. These plans shall be reviewed on an annual basis and updated if necessary.

The SES shall ensure compliance with the requirements of the health and safety clauses in the contract documents. This shall include, but not be limited to: (i) construction activities; (ii) HIV/AIDS education campaign; (iii) compliance with Viet Nam’s labor laws; and (iv) road traffic safety. For HIV/AIDS the focus shall not only be on the construction sites themselves, but also on assisting the nearby communities.
Site Inspections: The SES shall closely audit the construction activities through regular site inspections accomplished through daily site visits, walks and visual inspections to identify areas of potential environmental problems and concerns.

Inspections should be done independently from the Contractor’s staff. It is expected that the SES shall have their own hand held and portable monitoring equipment such as cameras, transport and other resources. Where definitive monitoring is necessary to resolve contentious issues or to impose penalties, the SES may contract third parties to carry out specific monitoring at the locations under review.

Where there is infringement of technical specifications, or condition of contracts, or non compliance with the EMP, the SES shall be immediately inform Contractor’s Chief Engineer, Supervision Chief Engineer and PMU3. The SES shall also report all infringements to the PMU3 as part of the monthly reporting.

Regular joint environmental site inspections (e.g. weekly) should be organized by the SES and CSC, with participation from the Contractor’s Environmental Officer (SEO). These should be used as an opportunity for the SES to further train the CSC and Contractor’s staff.

SES field engineer’s log-book shall be kept readily available for inspection by all persons assisting in project management.

The SES shall also regularly review the records of the contractors to ensure that they are up to date, factual and meet the EMP reporting requirements (e.g. environmental complaint monitoring records).

Complaints: Complaints will be received by the Contractor’s Site Office from local residents with regard to environmental infractions such as noise, dust, traffic safety, etc. The Contractor’s Chief Engineer or his deputy, and the SEO shall be responsible for processing, addressing or reaching solutions for complaints brought to them. The SES shall be provided with a copy of these complaints and shall confirm that they are properly addressed by the Contractors in the same manner as incidents identified during site inspections.

Unforeseen Impacts: In the event that an incident arises which was not foreseen in the EMP or EPC, the SES shall work closely with the CSC, the Contractors, and the PMU3 to confirm satisfactory resolution to the incident. The SES shall then update the EMP and the implementation guidelines, training the Contractors’ staff accordingly.

Monthly Payments: The SES shall confirm the monthly payments for environmentally related activities as recommended by the SES to the client.

Site Restoration and Landscaping: The SES shall closely monitor all activities with regard to site restoration and landscaping in areas such as borrow pits, quarries, crushing plants, etc. to ensure that the activities are done to an appropriate and acceptable standard. The SES will agree with the Contractor on a Site Decommissioning and Restoration plan to be implemented before the completion of the construction.

Project Initiation and Staffing: It is anticipated that the CSC and the SES, will be mobilized one month before the start of the construction activities. The one month start up time will be utilized by the SES to review and familiarize itself with the project, the project design, the technical specifications, contract documents, the EPC, EMP reports and other project relevant documents and reports. Following the review, the SES will prepare a brief report on the potential issues and challenges arising from the implementation of the EMP and the condition of contracts and make recommendations to the PMU3 about how best to improve the implementation of the EMP.

The SES is expected to be mobilized at the beginning of the contract, to prepare the necessary guidelines, documentation, training, etc.
• Reporting: As a minimum the SES shall prepare the following written reports:
  • Weekly report of non-compliance issues
  • Summary monthly report covering key issues and findings from reviewing and supervision activities
  • Consolidated summary report from contractor’s monthly report

They shall also collect and report on data as requested by the PMU3.

At the end of the project the SES shall prepare a final report summarizing the key findings from their work, the number of infringements, resolutions, etc. as well as advice and guidance for how such assignments should be conducted in the future.
Appendix 5 Independent environmental monitoring consultant (IEMC)

Objective of the assignment

The Independent Environmental Monitoring Consultant (IEMC) will be contracted to provide professional services (“the Services”) regarding environmental sampling, and reviewing compliance to the Environmental Management Plan (EMP) and the Environmental Specifications of the Project. IEMC shall provide support to PMU3 to establish and operate environmental management systems, offers suggestions for adjusting and building capacity for relevant agencies during the implementation period and monitor the Contractor’s EMP implementation plan in both construction and operation stages. IEMC will also be responsible to support PMU3 to prepare monitoring reports on EMP implementation.

Through this assignment, the effectiveness of the mitigation measures and reporting procedures will be verified, or recommendations shall be made regarding alteration of construction method or additional mitigation measures to make sure that the potential negative impacts related to the construction and operation of the proposed NH48 (the Road) are minimized.

Institutional Arrangements for EMP implementation

In order to achieve the goal of minimizing the negative environmental impacts of the project, the EMP has been integrated in the design of the Road, and in the technical specifications and contract documents. It will need to be closely followed and implemented by the Contractors. The implementation of the EMP will therefore involve three parties:

- The Contractor’s Workplace Safety and Environment Officer (SEO) responsible for implementing the EMP and other construction related environmental and safety issues.
- The Construction Supervision Consultant (CSC) who are responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSC will include a Workplace Safety and Environment Supervisor (SES); and,
- A Client’s Independent Environmental Monitoring Consultant (IEMC), who carry out environmental sampling and monitoring activities specified in this TOR.

Scope of services

The IEMC shall carry out monitoring twice a year, on all environmental-related issues regarding the contractor’s works. The IEMC will carry out field sampling, monitoring and check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project EMP are fully complied with. They will also supply specialized assistance to the client in environmental matters. IEMC’s specific tasks will include, but not limited to, the followings:

Task I: Environmental Sampling Monitoring

The IEMC shall carry out sampling and monitoring of environmental quality with parameters and frequency specified in Table 5 (see “Environmental Monitoring Requirements”)

Task II: Review and Assess Compliance to EMP by PMU3, CSC, SES and the Contractor

The IEMC shall review and evaluate the environmental performance and compliance of EMP by PMU3, CSC, SES and the Contractor from design to construction phases. The IEMC shall also assess the effectiveness of the mitigation measures to be implemented and the effectiveness of the reporting procedures. The review and evaluation should cover, but not
limited to the followings:

**Desk Review**: The IEMC shall review the completeness of the environmental records, reports and documents prepared by the PMU3, CSC, SES and the Contractor related to:

- Review the activities carried out and the records and documents created, updated, or maintained by the CSC;
- Allocation of staff as an SES;
- Written confirmation that there have been no major omissions of mitigation measures, or proposals on the updates to the EMP and the design and technical specifications to address these issues;
- The checklist developed for use during the construction of the project to monitor the contractor’s performance;
- A log-book of each and every circumstance or change of circumstances which may affect the environmental impact assessment and non-compliance with the recommendations made by the SES to remediate the non-compliance;
- Records on the design and training program for Supervision Engineers, Contractors, PMU3 staff, and workers;
- Records on day-to-day supervision carried out by the SES, such as:
  a. Review and inspect all aspects of the implementation of the EMP;
  b. Random monitoring, check and review on records prepared by the Contractor’s SEO;
  c. Regular site inspections;
  d. Review the status of implementation of environmental protection measures against the EMP and contract documents;
  e. Review the effectiveness of environmental mitigation measures and project environmental performance;
  f. Review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions, if applicable;
  g. Verification on the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures;
  h. Feedback review results to the PMU3 and CSC according to the procedures of non-compliance in the EMP;
  i. Review and recommendations for all site plans prepared by the Contractor;
  j. Monitoring of all activities with regard to site restoration and landscaping;
  k. Confirmation on proper address of complaints by the Contractor and/or PMU3;
  l. Proof of coordination between the SES and the CSC, the Contractors, and the PMU3 to confirm satisfactory resolution to the unforeseen impacts
- Review the activities carried out and the records and documents created, updated, or maintained by the Contractor or his SEO:
  a. Records and documents prepared for training on environmental awareness for the contractor’s workers.
  b. Site surveillance to investigate the Contractors’ site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
  c. Monitor the implementation of environmental mitigation measures and the Contractor’ compliance with environmental protection, pollution prevention and control measures, and contractual requirements;
  d. Advice to the Contractor(s) on environment improvement, awareness, proactive pollution prevention measures;
  e. Investigation and proposals on mitigation measures to the Contractor(s) in the case of non-compliance / discrepancies, if applicable;
f. Proof of participation in the monitoring and implementation of remedial measures to reduce environmental impact;
g. Review the success of the EMP to cost-effectively confirm the adequacy of mitigation measures implemented;
h. Preparation and submission of Contractor’s Compliance Reports and inclusion of environmental mitigation measures into Contractor’s progress reports;
i. Complaint investigation, evaluation and identification of corrective measures;
j. Additional monitoring works within the specified timeframe instructed by the Supervision Engineer and/or PMU3; and

• Review the activities carried out by PMU3 and records and environmental documents submitted to PMU3 by the CSC and Contractor:
  a. Allocation of staff responsible for environmental issues;
  b. SEO, SES’s recommendations, approval;
  c. Records on complaints received and solutions;
  d. Records of the mitigation measures implemented by PMU3 as specified in the EMP.

**Random site Inspection:**

As part of the monitoring process, the IEMC shall carry out a random check at the site. The IEMC shall visually look at the construction sites and make notes related to the following environmental issues, but not limited to:

- Compliance/violation to prohibitions to Contractor’s workers as specified in the Environmental Specifications;
- Waste management practices at worker’s camps, at the construction sites,
- Disruption of exiting services during construction;
- Status of construction workers’ camps and sanitation facilities for them;
- Water quality control facilities at and surrounding the workers’ camp;
- General clean up after construction works;
- Impacts of construction works (level of noise, dust) on surrounding residential areas, and damage to roads due to earthworks and transportation of building materials;
- Status of implementation of safety measures (signboards, restricted zone, fences, the use of protective equipment, etc.), particularly at the intersections and other traffic hotspots;

The IEMC shall also conduct public consultation to:

- Assess the level of involvement by the local authorities in dealing with environmental issues (dust, noise, and damage to roads due to the transport of construction materials and protected areas).
- Identify any other environmental issues and record environmental complaints from the affected people.
- Report on responses (if any) from appropriate local authorities on environmental complaints or incompliance

**Consultant Qualifications and staffing**

It is anticipated that the IEMC will be mobilized prior to the start of the construction activities. The one-month start up time will be utilized by the IEMC to review and familiarize itself with the project environmental monitoring program, and Environmental Management Plan, preparing the inception report and plan for their first field trip.

The Consultant shall submit the qualifications of the following key persons:

1. **Activity Leader/Senior Environmental Consultant**

   The position will be a senior environmental specialist with at least a Master degree in
environmental science or related discipline and have 10 year’s experience working with the environmental aspects of construction. Priority is given to the person who has experience in assessing and monitoring environmental aspects related to roads and bridges. The Team leader should be familiar with the World Bank’s environmental and social impact guidelines and have a proven record of managerial capabilities. The Team Leader will be responsible for directing the environmental monitoring for the project.

He/she will lead the team during field visit on a three monthly basis to inspect the Contractor’s compliance with the EMP, check the implementation of mitigation measures, assess the effectiveness and adequacy of the mitigation measures proposed/implemented, and give advices on additional mitigation measures or corrective actions, if necessary. At the end of each visit and before leaving the sites, he/she will lead discussion and brief to PMU3, SES and SEOs about their main findings and advise them on what need to be improved, evaluate compliance to EMP. He will take lead in the preparation and quality control of the three monthly monitoring reports. Fluency in spoken and written English will be required.

2. **Field Environmental Inspection Officer(s)**

This position(s) will require at least 5 year’s experience and a good understanding of the environmental issues related to roads and bridges, environmental impacts assessment and management processes. They will visit the project sites on a three monthly basis to inspect the Contractor’s compliance with the EMP and check the implementation of mitigation measures. He/she will also check relevant environmental documents and records prepared during construction phase. At the end of each visit and before leaving the sites, they will participate in discussions with PMU3, SES and SEOs about their main findings and advise them on what need to be improved. Knowledge of English language is required.

3. **Environmental Monitoring Specialist(s)**

This position(s) will require at least 5 years experience in environmental analysis and monitoring activities. They will be responsible for conducting environmental monitoring activities, including sampling, analyzing results and writing monitoring reports. Knowledge of the English language is required.

**Reporting Requirements and Time Schedule**

Report will be prepared according to Project’s requirements. In addition to hard copies, one digital electronic copy shall also be submitted. At the end of the contract, a digital copy of all documents relevant to the project shall be compiled in an orderly manner on a CD and be submitted to the Client.
Appendix 6: Training demands and proposals for a training program

The table below presents an analysis of training demands

Table 9. Analysis and determination of training demands

<table>
<thead>
<tr>
<th>No.</th>
<th>Subject</th>
<th>Preliminary assessment on capability/awareness</th>
<th>Capacity building/training on environmental management</th>
</tr>
</thead>
</table>
| 1   | Environment Unit - PMU3 | - Have most staff with University/post university education, thus it is easy to them to comprehend new contents  
- Have working experiences in previous projects but have not gone into details of the environmental field.  
- Have basic knowledge in information technology, thus it will be convenient for data management and information process as well as cooperation with other agencies. | - Should be further trained on environmental management process in project and implementation methods (from preparation stage of bidding documents, bid evaluation, contract signing, monitoring implementation and acceptance works, etc.).  
- Should increase awareness on critical roles of EMS  
- Should provide with more knowledge/legal regulations related to penalty for violations on the environment.  
- Should be provided with treatment solutions for arising problems on site. |
| 3   | Local leaders            | - The communes have not been made sufficiently clear and understood about the project process.  
- Computer skills are still limited.  
- Awareness on community organization and monitoring is not clear. Community organization and monitoring have only been implemented for small projects which are invested by residents.  
- Have no experiences in community monitoring on a large scale. | - Should be provided with preliminary knowledge on environmental laws and contents related to coordination in monitoring among ward/commune authorities in projects which are executed in the areas.  
- Should be trained on community monitoring.  
- Should have updated information on project progress and monitoring and information exchange regime.  
- Especially, environmental management process should be made clear and comprehended before, during and after construction. |
| 4   | Community representatives | - Not been established in the local area. Thus participants have not been determined  
- Most project areas are rural ones with cultivation works. Education is limited and working style is primarily spontaneous.  
- Income of residents is not high; infrastructure system is not sufficient; awareness on rights and responsibilities of individuals and community on environmental issues are                                             | - Should be provided with rights and responsibilities in environmental management (as well as legal regulations.)  
- Should be provided with clear simple methods which will be applied during project implementation process.  
- Increase the awareness of community on environmental management generally and potential impact of the project in particular.  
- Continuously utilize project information and important points in |
Based on an analysis of current capabilities, experiences and actual demands in project implementation, a capacity building and training program for relevant agencies is established as shown in the table below:

**Table 10. Proposed programs on capacity building on environmental management**

<table>
<thead>
<tr>
<th>Training content</th>
<th>Subject to be trained</th>
<th>Number of trainees</th>
<th>Training time</th>
<th>Organization unit</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning on Labor safety and environmental sanitation</td>
<td>Contractor’s leaders are qualified and experienced staffs who are competent in legal regulations.</td>
<td>All workers and staff on site</td>
<td>Prior to construction and following legal regulations</td>
<td>Contractor in coordination with Institute of Labor, War Invalids and Social Affairs</td>
<td>Paid by Contractor</td>
</tr>
<tr>
<td>Learning on general environmental management process</td>
<td>Staff of PMU3 and public utility companies</td>
<td>3 persons</td>
<td>Prior to construction</td>
<td>PMU3 in coordination with IEMC</td>
<td>Paid by PMU3 or to be included in a package on training</td>
</tr>
<tr>
<td>Learning on Process of CEMP</td>
<td>Environmental staff under ward PC in the project area</td>
<td>22 persons (5 district staffs + 17 town/ commune staffs)</td>
<td>Prior to construction</td>
<td>Training consultant under Contract on capacity building and training for relevant agencies.</td>
<td>Included in Contract on training consulting</td>
</tr>
<tr>
<td>Learning on Process of SEMP</td>
<td>Staff in charge of labor safety and environmental sanitation under CSC</td>
<td>5 trainees</td>
<td>Prior to construction</td>
<td>PMU3 in coordination with CSC</td>
<td>In the Contract of CSC</td>
</tr>
</tbody>
</table>
Appendix 7: Cost estimate

Cost of Environmental Supervision carried out by CSC.

The CSC will be responsible for proposing organization and monitoring plans on the Contractor’s compliance with mitigation measures. In addition, CSC will be required to assign staff and prepared detailed working plans to monitor environmental sanitation and labor safety management on and around the site. The cost for this assignment will be proposed in the contract with CSC.

Monitoring Cost of Independent Monitoring Consultant (IEMC)

PMU3 shall sign a contract with IEMC. IEMC shall implement assignments of all project components according to the TOR.

The estimation costs for the IEMC (excluding monitoring and training costs) are following:

Table 11. Cost Estimate for Environmental Management Work

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Environmental management staff</td>
<td>month</td>
<td>4</td>
<td>21,000,000</td>
<td>84,000,000</td>
</tr>
<tr>
<td>4</td>
<td>Other costs</td>
<td>%</td>
<td>5</td>
<td></td>
<td>4,200,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>88,200,000</strong></td>
</tr>
</tbody>
</table>

Implementation Cost of the Monitoring Program

Based on the above-mentioned monitoring program the estimated costs for implementing this program are presented in the following table.

Table 12. Costs estimation for the monitoring program

<table>
<thead>
<tr>
<th>2</th>
<th>Items</th>
<th>Construction stage (within 2 years as expected)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Location</td>
</tr>
<tr>
<td>1</td>
<td>Monitoring air quality</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Monitoring noise</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Monitoring vibration</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Other cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

Notes: The above cost estimate excludes VAT tax. Other costs include costs for manpower, traveling, preparation of survey reports, etc.

Total estimated cost for implementation of a monitoring program is 419,556,480 VND. For the purpose of effective implementation, the monitoring program implementation can be combined with the contract established with IEMC.

Cost for implementation of capacity building and training

The cost estimation for implementation of capacity building and training is presented in the following table:
### Table 13. Cost estimation for implementation of capacity building and training

**Unit: VND**

<table>
<thead>
<tr>
<th>Training contents</th>
<th>Subject to be trained</th>
<th>Number of trainees</th>
<th>Cost rate</th>
<th>Source of cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning on labor safety and environment sanitation</td>
<td>Workers and technicians of Contractors</td>
<td>All workers and construction staff on site (100 turns of persons as expected)</td>
<td>100 x 200,000 = 20,000,000</td>
<td>Paid by contractor, this cost is included in the contract of construction</td>
</tr>
<tr>
<td>Learning of general environmental management process</td>
<td>PMU3’s staff in charge of construction packages</td>
<td>3 persons</td>
<td>3 x 3,000,000 = 9,000,000</td>
<td>This cost should be included in the signed with training consultant</td>
</tr>
<tr>
<td>Learning on CEMP</td>
<td>Environmental staff under ward/commune PC in the project area</td>
<td>22 persons (5 district staff + 17 town/commune staff)</td>
<td>22 per, x 1,000,000/per, = 22,000,000</td>
<td>Included in the contract signed with training consultant</td>
</tr>
<tr>
<td>Learning on SEMP</td>
<td>Staff in charge of labor safety and environmental sanitation under CSC</td>
<td>5 trainees</td>
<td>5 per, x 1,000,000/per, = 5,000,000</td>
<td>In the Contract of CSC</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td></td>
<td></td>
<td><strong>56,000,000</strong></td>
<td></td>
</tr>
</tbody>
</table>