MEKONG DELTA REGION-URBAN UPGRADES基 P M D R-UUP)
TRA VINH CITY SUB-PROJECT

SUMMARY OF ENVIRONMENTAL IMPACTS ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN
ENVIRONMENT IMPACT ASSESSMENT REPORT

MEKONG DELTA REGION URBAN UPGRADING PROJECT
TRA VINH CITY SUB-PROJECT

Project owner
TRA VINH CITY PEOPLE’S COMMITTEE

Consultant
PACIFIC OCEAN ENGINEERING JOINT-STOCK COMPANY (PCO)

Diếp Văn Thành

GIẢM ĐỐC
Nguyễn Công Minh
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3. Community consultation and information disclosure
4. Involuntary resettlement (OP 4.10)
5. Policy on indigenous people (OP 4.12)
7. Feasibility Study Report on Urban Upgrading Project sub-project for Tra Vinh City, the Project Management Unit - 2011.
8. The EIA reports for the Urban Upgrading Project Ho Chi Minh City (2007-2009)
15. Detailed outline documents of Urban Upgrading Project of the Cuu Long river delta region - subproject Tra Vinh city.
16. The memorandums from the World Bank (WB).
### ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC</td>
<td>Construction Supervision Consultant</td>
</tr>
<tr>
<td>CUPs</td>
<td>Community Upgrading Plans</td>
</tr>
<tr>
<td>DONRE</td>
<td>Department of Natural Resource and Environment</td>
</tr>
<tr>
<td>ECOP</td>
<td>Environmental Code of Practice</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EMDP</td>
<td>Ethnic Minority Development Plan</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental Management Plan</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental Monitoring System</td>
</tr>
<tr>
<td>GoV</td>
<td>Government of Vietnam</td>
</tr>
<tr>
<td>IEMC</td>
<td>Independent Environmental Monitoring Consultant</td>
</tr>
<tr>
<td>LIA</td>
<td>Low-Income Area</td>
</tr>
<tr>
<td>MoC</td>
<td>Ministry of Construction</td>
</tr>
<tr>
<td>NUUP</td>
<td>National Urban Upgrading Program</td>
</tr>
<tr>
<td>MDR-UUP</td>
<td>Mekong Delta Region Urban Upgrading Project</td>
</tr>
<tr>
<td>PCR</td>
<td>Physical Cultural Resources</td>
</tr>
<tr>
<td>PMU-MoC</td>
<td>MoC Project Management Unit</td>
</tr>
<tr>
<td>PPMU</td>
<td>Provincial Project Management Unit</td>
</tr>
<tr>
<td>RAP</td>
<td>Resettlement Action Plan</td>
</tr>
<tr>
<td>RP</td>
<td>Resettlement Plan</td>
</tr>
<tr>
<td>RPF</td>
<td>Resettlement Policy Framework</td>
</tr>
<tr>
<td>RPs</td>
<td>Resettlement plans</td>
</tr>
<tr>
<td>SEMP</td>
<td>Site Environmental Management Plan</td>
</tr>
<tr>
<td>TA</td>
<td>Technical Assistance</td>
</tr>
<tr>
<td>URENCO</td>
<td>Urban Environment Company</td>
</tr>
<tr>
<td>VUUP</td>
<td>Vietnam Urban Upgrading Program</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WWTP</td>
<td>Waste water treatment plan</td>
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</table>
INTRODUCTION

Background

This EMP identifies mitigation actions to be carried out under the subproject including the environmental monitoring program and the implementation arrangements. The EMP complies with the Government's EIA regulations and the World Bank (WB)'s safeguard policies, including those of the World Bank's Environmental, Health, and Safety Guidelines.

The EMP presents a summary of the city project description and brief baseline information of the project city, and a summary of the key environmental impacts. The actual EMP actions are based on the assessment of potential negative impacts, as summarized below, and the identification of actions to mitigate these impacts. EMP implementation management actions, capacity building, and environmental monitoring measures form part of the EMP.

Basis of law, legislation and regulation

The project is required to comply with the prevailing environmental laws in Vietnam, which include the Law on environmental protection No. 52/2005/QH11 dated 29/11/2005, Decrees, Circulars, Decisions, standards and regulations of Vietnam on Environment; Circular No. 26/2011/TT-BTNMT dated 18/04/2011 of the Minister of Natural Resources and Environment on guidelines for preparation of strategic EIA reports; and Vietnamese standards and regulations. The project must also comply with the triggered safeguard policies of the World Bank, as summarized in Table 1 below. Very small areas of natural habitats (secondary urban forests and watercourses) are affected by the project but as these impacts are minor they do not trigger the Natural Habitats policy of the Bank (OP 4.04).

### Table 1: Compliance with world bank safeguards policies

<table>
<thead>
<tr>
<th>Safeguard Policy</th>
<th>Compliance Actions</th>
</tr>
</thead>
</table>
| Environmental Assessment (OP/BP 4.01) | • A detailed EIA including an Environment Management Plan (EMP) has been prepared for each project city. Summary EIA and EMP reports for each city and a Consolidated EIA Report have also been prepared for and submitted to the WB.  
• Social Assessments have been conducted for the six cities; social impacts were also considered in the EIAs. |
| Physical and Cultural Resources (OP/BP 4.11) | • Environmental screening conducted in the six cities included screening for Physical Cultural Resources (PCR); no PCR are expected to be found in project areas.  
• Chance finds procedures for archaeological artifacts found during construction have been prepared and will be included in bidding documents and construction contracts.  
• 15 graves will need to be relocated in the Tra Vinh Subproject; full compensation will be provided to the affected families. |
| Involuntary Resettlement (OP/BP 4.12) | • City-specific Resettlement Plans (RPs) have been prepared for each city. |
| Indigenous Peoples (OP/BP)            | • Ethnic Khmer minority communities live in some project LIAs. Four Ethnic Minorities Development Plan (EMDPs) have been prepared. |
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

<table>
<thead>
<tr>
<th>Safeguard Policy</th>
<th>Compliance Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.10) prepared for the Tra Vinh subproject where these Khmer communities live.</td>
<td></td>
</tr>
<tr>
<td>Projects on International Waterways (OP 7.50)</td>
<td>- Upgrading of drainage and wastewater systems will affect volumes and quality of discharges into tributaries of the Mekong River, an international waterway. However, the exception under sub-paragraph 7 (c) of the policy applies, i.e. the tributaries run exclusively in one state (Vietnam) and this state is the lowest downstream riparian.</td>
</tr>
<tr>
<td>Public consultation and disclosure</td>
<td>- Intensive, culturally-sensitive consultations were carried out in all communities in the project areas of the six cities, including with ethnic minority groups in relevant cities. The key comments and project responses are reported in the EIA and in the EMDP. Government agencies and NGOs were also consulted in public meetings or have sent their written opinion as required by the Government’s environmental regulations. The final draft of the EIA and RP for the Tra Vinh City and the EMDP were disclosed prior to project appraisal.</td>
</tr>
</tbody>
</table>
1 - PROJECT DESCRIPTION

Table 2: Investment items of Tra Vinh Subproject

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Component 1</td>
<td></td>
<td>Tertiary Infrastructure upgrading and service improvement in 23 LIAs (US$ 18.292 million)</td>
</tr>
<tr>
<td>1.1</td>
<td>Upgrading and widening of alleys</td>
<td>Phase 1: LIAs 1, 2, 5, 6, 7, 10, 11, 12, 14, 15, 17, 19</td>
<td>A total of 197 alleys to be upgraded and widened to 2.5 - 6 m. Alleys are elevated from 10 – 50 cm above existing level. The total length of alley route: 37 km.</td>
</tr>
<tr>
<td>1.2</td>
<td>Installation of drainage systems.</td>
<td>Phase 2: Remaining LIAs</td>
<td>Within alley alignment, drainage systems are constructed with dimension D400 - D1200. The total length of drainage line is 48.6 km.</td>
</tr>
<tr>
<td>1.3</td>
<td>Installation of public lighting system</td>
<td></td>
<td>Public lighting systems are installed in upgraded alleys consisting of a total of 91 km lighting alignment, and 1055 lights and lighting poles.</td>
</tr>
<tr>
<td>1.4</td>
<td>Construction of community houses</td>
<td></td>
<td>Construction of 07 community halls in ward 7 with an area between 560 to 2000 m² each. A recreation area is constructed for communities in LIA 10 and 14 with land size of 6,000 m², including the cultural items, communication equipment, and green-space with trees.</td>
</tr>
<tr>
<td>1.5</td>
<td>Provision of solid waste management equipment</td>
<td>Phase 1</td>
<td>Provision of 120 l solid waste collection bins and located at the entry of alleys. Also, provision of 660 l garbage hand carts.</td>
</tr>
<tr>
<td>2</td>
<td>Component 2</td>
<td></td>
<td>Upgrading secondary infrastructure (US$ 8.754 million)</td>
</tr>
<tr>
<td>2.1</td>
<td>Upgrading 3 roads connecting to LIA 1</td>
<td>Phase 2</td>
<td>Construct 6 m lane, total width of 15 m, and total length of 1,356 m. Road surface is elevated from 50 – 70 cm above existing level to prevent flooding. Attached infrastructure includes: (i) D100 water supply pipeline with total of 1,630 m serving LIA 1 (ii) D100 surface water drainage pipes 3.3 km length, (iii) public lighting system of 1.5 km length.</td>
</tr>
<tr>
<td>2.2</td>
<td>Construction of extended Nguyen Dang road</td>
<td>Phase 2</td>
<td>To connect LIAs to downtown area, and the city ring road. Construct road with width of 32 m, 398 m length. Road surface level same as the existing level of Nguyen Dang road. The projects includes: (i) D1500 drainage of 774 m length connecting to existing drainage of Nguyen Dang road and discharged into Long Binh river, (ii) D100 water supply system of 1.3 km length for residents in LIA 12, (iii) public lighting system of 1.25 km length alignment along the road, connected...</td>
</tr>
</tbody>
</table>
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>Construct embankments and roads on both sides of Ben Xuong canal</td>
<td>Phase 2</td>
<td>Canal water is presently discharged to Co Chien River. Project consists of: (i) dredging 530 m at the section through the resettlement area with an estimated volume of 10,000 m³, (ii) construct embankments on both sides of the canals in the resettlement area with a total of 1,060 m of quarry stone embankment structure; (iii) construct on both sides of canal roads of 10 m wide each; (iv) D300 roadside drainage system for wastewater collection with total length of 1060 m and discharged to nearby canals; (v) D600 surface water drainage system with total length of 1,060 m; (vi) public lighting systems 1040 m length; (vii) and landscaping along the road with an area of 2,226 m².</td>
</tr>
<tr>
<td>2.4</td>
<td>Installation of main and secondary water supply network</td>
<td>Phase 1</td>
<td>Construction of main and secondary water pipelines with D100 - D150 for 13 LIAs.</td>
</tr>
<tr>
<td>2.5</td>
<td>Installation of tertiary and secondary water drainage system</td>
<td>Phase 2</td>
<td>Complete drainage of surface water from tertiary drains in LIAs to the receiving facilities at Long Binh river, Cho canal or the main drainage system of the city. Drainage dimensions: D1000 - D1500 pipe with a total length of 13.6 km, serving 14 LIAs.</td>
</tr>
<tr>
<td>3</td>
<td>Component 3</td>
<td>Resettlement areas (US$ 2,349,739 million)</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Resettlement site at Ward 1 and Long Duc Commune.</td>
<td>Phase 1</td>
<td>Construct resettlement area in ward 1 and Long Duc commune. The 5 ha resettlement site is estimated to serve 158 households eligible for relocation under the project. Average lot size ranges from 90-120 m². Supporting infrastructure includes water supply and drainage, wastewater treatment, and electricity supply.</td>
</tr>
</tbody>
</table>
2 - BASELINE CONDITIONS

2.1. Geography and natural conditions

Geography and climate

Tra Vinh city is the administrative, economic, social center of Tra Vinh province. The city area is 68,035 km². The City is bounded by the Co Chien River on the North and is located about 200 km from Ho Chi Minh City and about 100 km from Can Tho city. The topography is relatively low and flat, with an elevation of about +1.2 m above sea level. The area is divided into two different landscape types: (i) the sand mounds which extend from north to south with an average elevation of +2.0 m; and (ii) farmland located on both sides of the sand mounds, with an elevation of +0.8 m.

The rivers in Tra Vinh city are strongly influenced by the East Sea tidal regime via major rivers such as the Co Chien River, Tra Vinh River, Lang The River and extensive canal networks. Tidal peaks reach an average of 0.6 m to 1.5 m.

The rainy season extends from May to October with total annual rainfall ranging from 1,227 to 1,588 mm. Average annual temperatures range from 26.6 - 26.8 °C while the highest maximum temperature is 37.8°C.

2.2. Environmental Baseline

Sampling indicates that the air quality has been degraded due to human activity and vehicular traffic. Dust concentrations exceed thresholds by as much as 1.1 times higher than the standards in densely populated and travelled areas. However, dust, noise and vibration in rural areas of the city are within the allowable limits.

Long Binh River is a main surface water source in the city. Based on monitoring, TSS, BOD and organic content are above allowable limits due discharges of solid waste and wastewater from residential areas. The maximum value exceeding the threshold of the current standards is 1.2 times. However, heavy metal concentrations are within allowable limits for sludge and sediment samples taken from river and canal systems. This sludge can be applied for agricultural purposes.

The results of water sampling at residential wells indicate contamination of coliform and iron. The contents of iron and micro-organisms are higher than the current standards of drinking water by 2 to 16 times.

2.3. Economic and social characteristics

Socio-economic conditions

Tra Vinh city has total population of 103,713 inhabitants (2010). The density of population is 1,514 persons/km². The annual population growth rate is 1.02%.

The dominant employment in the city is family trading and small services which accounts for 25.6%. However, unsteady employment rates are 25.4% resulting in a poverty rate in the LIAs of 26.3% with a corresponding average income of 19.8 million VND/year.

The Kinh ethnic group is the main race in the city accounting for up to 60.1% of the population. The remaining population is Khmer.
Urban infrastructure and services

Surface water in the project area is affected by saltwater intrusion; therefore the city utilizes groundwater to supply clean water. For households located in suburban areas, the groundwater extraction is done by drilling household wells or dug wells.

Currently, the city drainage system has only been constructed in the inner urban areas of Tra Vinh city. An insufficient drainage system coupled with a road surface higher than residential areas results in flooding of households. The tidal influence occurring twice per month results in local flooding, up to 50 cm, in residential areas. The flood frequency is about 90 days/year due to rainfall, tidal surges and low-lying terrain.

Tra Vinh Urban Works Company is responsible for solid waste collection and environment sanitation. The company collects waste from 60% of the inner city. Collected waste is transferred to two transit points on Ly Tu Trong road and Pham Ngu Lao road. Compactor trucks then transport the waste to the Luong Hoa landfill, Chau Thanh district, 7 miles away from the city. The landfill is about 10ha in size.
3 - SUMMARY OF ASSESSMENT OF NEGATIVE IMPACTS

When the project is completed, the overall impact will be positive. Nevertheless, the project will cause some negative impacts on the local environment and the local population. Therefore, effective implementation of mitigation measures will be necessary.

The potential negative impacts on the physical, biological, and socio-economic environments are identified using the checklist method, including assessment of the levels of impacts during the preconstruction, construction, and operation phases. Potential negative cumulative social impacts on physical cultural resources (PCR) have been identified separately.

3.1. General Impacts

Based on the analysis of baseline data, field visits, and discussion with key officials and stakeholders, the potential negative impacts on the physical, biological, and socio-economic environment caused by the project have been identified. Table 3 summarizes the potential impacts by the project subcomponents. The level of impacts are assigned as follows: None (N) – no impact; Low (L) – Small works, minor impacts, localized, reversible, temporary; Medium (M) – Small works in urban/sensitive areas, medium scale works with moderate impacts of which most are reversible, reducible and manageable, localized, temporary; High (H) – Medium scale works in small urban/sensitive area, large scale works with significant impacts (socially and/or environmentally) of which some are irreversible and require compensation. The residual impacts of the project, after implementation of mitigation measures discussed in the EMP, are expected to be mostly negligible.

In general, the project activities to be carried out under Component 1 (Tertiary Infrastructure Upgrading in Low Income Areas), Component 2 (Primary and Secondary Infrastructure Upgrading), and Component 3 (Resettlement Sites) will involve small and/or medium scale civil works. Most of the potential negative impacts are reversible, temporary, and localized, and can be mitigated. Mitigation will require the application of good engineering and construction management practices, with close supervision and monitoring of contractor performance and consultation with local communities. However, one large scale subcomponent of Component 2 may create impacts that may not be fully reversible or temporary, such as constructing the Ben Xuong embankment.
Table 3. Levels of Potential Negative Impacts of the Tra Vinh subproject

<table>
<thead>
<tr>
<th>Components</th>
<th>Physical</th>
<th>Biological</th>
<th>Socio</th>
<th>Others</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air, noise, vibration</td>
<td>Land, soil, water</td>
<td>Solid waste, Sludge</td>
<td>Forest, natural habitat s</td>
<td>Fish, aquatic life</td>
<td>Land acquisition, resettlement</td>
</tr>
<tr>
<td>Component 1: Tertiary Infrastructure upgrading and service improvement in 23 LIAs (US$ 18.292 million)</td>
<td>Upgrading and widening of alleys; Installation of drainage systems; Installation of public lighting system; Construction of community houses; Provision of solid waste management equipment.</td>
<td></td>
<td></td>
<td></td>
<td>Small-scale impacts are best addressed through ECOPs (see Note 2 below)</td>
</tr>
<tr>
<td>Pre-const.</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Construction</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Operation</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Component 2: Upgrading secondary infrastructure (US$ 8.754 million)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subcomponent 2.1: Upgrading road connecting to LIA 1</td>
<td>Construct 6m lane, total width of 15m, total length of 1,356m. Road surface is elevated from 50 – 70 cm above existing level to prevent flooding. Attached infrastructure includes: (i) D100 water supply pipeline with total of 1,630m (ii) D1000 surface water drainage pipes 3.3 km length, (iii) public lighting of 1.5 km length.</td>
<td></td>
<td></td>
<td></td>
<td>Issues are populated areas with limited road access; minor dredging; local flooding; off-site impacts;</td>
</tr>
<tr>
<td>Pre-const.</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Construction</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>N</td>
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</tbody>
</table>

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

<table>
<thead>
<tr>
<th>Operation</th>
<th>L</th>
<th>L</th>
<th>L</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>M</th>
<th>N</th>
<th>disturbance to residents. - Ensure effective O&amp;M; disposal of solid waste and into the manholes; local flooding.</th>
</tr>
</thead>
</table>

#### Subcomponent 2.2: Construction of extended Nguyen Dang road

Construct road with width of 32m, 398m length. The projects includes: (i) D1500 drainage of 774m length, (ii) D100 water supply system of 1.3 km length, (iii) public lighting of 1.25 km length.

<table>
<thead>
<tr>
<th>Pre-const.</th>
<th>M</th>
<th>M</th>
<th>M</th>
<th>N</th>
<th>N</th>
<th>H</th>
<th>N</th>
<th>H</th>
<th>M</th>
<th>L</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
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<td>M</td>
<td>M</td>
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</tbody>
</table>

#### Subcomponent 2.3: Construct embankments and roads on both sides of Ben Xuong Canal

Project consists of: (i) dredging 530 m at the section through the resettlement area with volume of 10,000 m³, (ii) construct embankments on both sides of the canals with total of 1,060 m of quarry stone tilted roof deck structure; (iii) construct on both sides of canal roads of 10 m wide each; (iv) D300 roadside drainage system for wastewater collection with total length of 1060 m and discharged to nearby canals; (v) D600 surface water drainage system: 1,060 m; (vi) public lighting: 1040 m length; (vii) landscaping along the road: 2,226 m².

<table>
<thead>
<tr>
<th>Pre-const.</th>
<th>M</th>
<th>M</th>
<th>M</th>
<th>L</th>
<th>N</th>
<th>L</th>
<th>H</th>
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<tbody>
<tr>
<td>Construction</td>
<td>M</td>
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<td>H</td>
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<td>M</td>
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<td>M</td>
</tr>
</tbody>
</table>

#### Subcomponent 2.4: Installation of main and secondary water supply network

Construction of main and secondary water pipelines with D100 - D130 for 13 LIA.

<table>
<thead>
<tr>
<th>Pre-const.</th>
<th>L</th>
<th>L</th>
<th>L</th>
<th>N</th>
<th>N</th>
<th>N</th>
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<th>L</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
</tbody>
</table>

Small-scale impacts best addressed through ECOPs (see Note 2 below)

---

**PMU of Tra Vinh City Subproject**

Consultant: Pacific Technology JS. Co. (PCO)
Summary of EIA and EMP
Mekong Delta region Urban Upgrading Project (MDR-UUP) - Tra Vinh city Sub-project

<table>
<thead>
<tr>
<th>Operation</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subcomponent 2.5: Installation of tertiary and secondary water drainage system:</strong> Complete drainage of surface water from tertiary drains in LIAs to the receiving facilities at Long Binh river, Cho canal or the main drainage system of the city. Drainage dimensions: D1000 - D1500 pipe with a total length of 13.6 km, serving 14 LIAs.</td>
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<td></td>
</tr>
</tbody>
</table>

| Pre-const. | L | L | L | N | N | L | N | N | L | L | L | N | N |
| Constructio | M | M | M | N | N | N | N | N | H | M | M | N | N |

- Issues are populated areas with limited road access; minor dredging and disposal of dredged materials; local flooding; off-site impacts; disturbance to residents.

<table>
<thead>
<tr>
<th>Operation</th>
<th>L</th>
<th>L</th>
<th>L</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>M</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>N</th>
</tr>
</thead>
</table>

- Ensure effective O&M; disposal of solid waste and into the manholes; local flooding.

| Component 3: Resettlement areas (US$ 2,349,739 million): Construct resettlement area in ward 1 and Long Duc commune. The 5 ha resettlement site is estimated to serve 158 households eligible for relocation under the project. Average lot size ranges from 90-120 m². Supporting infrastructure includes water supply and drainage, wastewater treatment, and electricity supply. |

| Pre-const. | M | M | L | L | L | L | M | N | N | M | M | M | M |
| Constructio | M | M | M | L | L | N | N | N | M | M | M | M | N |

- Need for imported fill from offsite; local flooding; disturbance to residents (small road, densely populated).

<table>
<thead>
<tr>
<th>Operation</th>
<th>L</th>
<th>M</th>
<th>M</th>
<th>N</th>
<th>M</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>L</th>
<th>L</th>
<th>N</th>
<th>N</th>
<th>N</th>
</tr>
</thead>
</table>

- Need to address risks due to inadequate O/M (wastewater will be treated by onsite package treatment plant; livelihood restoration; and local flooding).

Notes: (1) The following criteria are used for the assessment of level of impacts: None (N) = no impact; Low (L) = Small works, minor impacts, localized, reversible, temporary; Medium (M) = Small works in urban/sensitive areas, medium scale works with moderate impacts of which most are reversible, reducible and manageable, localized, temporary; High (H) = Medium scale works in small urban/sensitive areas, large scale works with significant impacts (socially and/or environmentally) of which many are irreversible and require compensation; Both M and H need monitoring and implementation of the mitigation measures as well as adequate institutional capacity on safeguard.

(2) For small and medium scale works, most impacts are localized, temporary, and can be mitigated through the application of good engineering and construction management practices and with close supervision and monitoring, and close consultation with local communities.

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
### 3.2. Site – specific impacts assessment

<table>
<thead>
<tr>
<th>Concerned area</th>
<th>Specific impacts Analysis and evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. PRE-CONSTRUCTION STAGE</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 1. Nguyen Dang extended road of Component 2 | Impacts due to removal of gravestone:  
- This region has 15 gravestones of Mr. Tran Thanh Liem’s family at Hamlet 10, Ward 7, Tra Vinh City; to expand Nguyen Dang Street; these gravestones will have to remove.  
- Although the displacement of graves doesn’t cause pollution, moving the tombs has an emotional impact on relatives.  
- In order to evaluate impact levels to people, the investment owner and consulting unit interviewed and collected suggestions of affected relatives and results of consultation was as follows:  
  - Requirements of family: To agree exhumation of these graves, but must receive satisfactory compensation. |
| ![Nguyen Dang expanded road](image) | ![15 gravestones of Mr. Liem's family](image) |
| **II. CONSTRUCTION STAGE** | |
| COMPONENT 1 | |
| 1. Upgraded alleys of LIAs in central area of city (Ward 1, 2, 4, 5 và 6) | There are impacts due to wastewater and storm water not being discharged properly. According to feedback from both people in the area of the upgraded alleys and local authorities of ward 2, local flooding can occur during construction. During rainy days, water may accumulate since the area of LIA 2 is low lying and presently there are no sewers or drainage networks. There are no drainage routes for this LIA. Stagnant water contaminated with solid waste and construction wastes may adversely impact the health and quality of peoples’ lives. |
| ![Concerned area](image) | ![Specific impacts Analysis and evaluation](image) |
| 2. Sensitive works in LIA 3, 5, 6, 9, 13, 15, 18, 23 | Impacts to these works:  
- Dust: generated during site clearance, land leveling, and construction of drainage and water supply systems, road surface concreting and aggregate application.  
- Noise and vibration: Impacts due to noise are relatively small because construction uses small machines with low noise levels. Nearest sensitive place to construction is over 10 m.  
- Khmer community festivals days occur on January 15, April 15, July 15, October 15, May 20 (Lunar calendar) every year. On these days, construction activities may impact the ceremonies and obstruct entrances of Pagodas.  
- Safety issues for the Huong Duong Kindergarten: Uncovered ditches /culverts for construction may cause hazards to parents and students during pick up and drop off periods near school entrances.  
Consultancy: Field interview have concluded that community leaders are concerned with noise and dust problems, and obstruction of entrances to Pagodas. |
| ![Concerned area](image) | ![Specific impacts Analysis and evaluation](image) |

PMU of Tra Vinh City Subproject  
Consultant: Pacific Technology JS. Co. (PCO)
Pollution of water source at Ben Xuong creek due to embankment construction:
- According to calculation, the amount of dredged materials for building embankments and roads at Ben Xuong creek is about 10,000 m³, of which about 10% (1,000 m³) is organic sludge accumulating at the bottom of Ben Xuong creek and the remaining sediment is sand at the bottom of the ditch.
  - The analysis showed that a soil pH > 6 in the canal area Ben boat does not have potential for forming acid sulfate soils. So acidification of water quality of Ben Xuong creek is not likely. (Potential acid sulfate soil has pH 2-4).
  - According to analysis results of heavy metal content in bottom sludge of Ben Xuong creek, concentration levels are suitable for application on residential areas but not acceptable for use on agricultural land.
  - Therefore, dredged materials from Ben Xuong creek is divided into two (02) categories:
    Category 1: Solid wastes floating on the ditch and organic sludge layer at the bottom, the volume of two (02) kinds is about 1,000 m³. These wastes must be disposed separately in the city's landfill site.
    Category 2: The rock layer at the bottom of the ditch will be excavated to expand canals, and create more depth. The rock layer can be used as fill material. It is necessary to consider matter of aluminous soil.
- To pay attention to mitigation measures for construction workers in followin cha ter.

Pollution due to dredging in Ben Xuong creek, possibility of hazardous waste leakage (lubricant of dredging facilities, material, soil, sludge transportation means)
Embarkment construction at Ben Xuong creek (length of about 500m) will impact water quality due to the following:
1. Canal dredging process: This activity will increase the concentration and dispersion of pollutants causing water quality deterioration of Ben Xuong canal. The water use of the Ben Xuong creek is for irrigation and transport. The section of canal 200m before and after the project site is not used, therefore impact of the dredging is low because the suspended matter will have deposited after 100m and water quality will return to normal.
2. Pollution caused by rainwater spreading pollutants and waste lubricants:
  - Waste lubricants are generated during maintenance of construction vehicles and machinery.
  - Proper waste lubricant storage measures are required to ensure that rainwater will not disperse into Ben Xuong creek hazardous wastes and construction wastes.
### 2. Item of drainage route on Le Van Tam road, specific sites in below figure

<table>
<thead>
<tr>
<th>Impacts due to construction of sewers routes on Le Van Tam Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of sewers routes on Le Van Tam Street will affect sensitive works as follows:</td>
</tr>
<tr>
<td>- The Sanec Pagoda</td>
</tr>
<tr>
<td>- The Sambua Pagoda</td>
</tr>
<tr>
<td>- The Ong Ta Temple</td>
</tr>
<tr>
<td>- The Sambua market (small market of about 10 small traders)</td>
</tr>
</tbody>
</table>

Impacts to cultural works are:

- **Dust**: Dust will be generated during digging and construction of drainage system and road construction. The dust can spread and impact sensitive works. Dust dispersion depends on many factors including humidity, distance, and height of fences and trees around the project. Through field surveys of sensitive work on this route, all the temples have large grounds and many trees, often away from the main road. So the dust impact to these areas is not high. But, for Sambua market the dust impact during construction is extremely high, so appropriate mitigation measures should be applied.

- **Noise and vibration**: Distance from sensitive works to generating sources is <10 meters. However, the sensitive works have fortified gates that will not be impacted by vibrations.

- **Affects to activities of works are**: Construction at near Pagoda gates may adversely impact festival days occurring on January 15, April 15, July 15, October 15, May 20 (Lunar calendar) every year.

### COMPONENT 3:

#### 1. Project's resettlement area.

<table>
<thead>
<tr>
<th>Impacts due to leveling and increasing elevation lifting using contaminated material:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Leveling will require a large amount of fill (about 100,000m³). The source of leveling material must be strictly controlled. Otherwise, there could be adverse impacts from pollutants leaching from the fill materials. Possible contaminants include arsenic and aluminum containing soils.</td>
</tr>
<tr>
<td>- If materials for leveling contain pollutants, rain can disperse contaminants in the aquatic and soil environment surrounding the resettlement area.</td>
</tr>
</tbody>
</table>

**Impact due to local flooding in resettlement surrounding area:**

- The resettlement area will be elevated from +1.5-2.0 m; rainwater runoff from resettlement to the surrounding area create flooding and erosion.
- An analysis of the natural drainage and topography in the resettlement area indicates that there is no clear natural drainage, since the land is relatively flat. If the direction of natural flow is from Phu Hoa street down to Ben Xuong creek, the drainage area affected is about 150,000 m² (including 50,000 m² of resettlement site, see below figure). For a rain event of 100 mm, the volume of runoff water calculated as 11.250m³. The drainage water flow is relatively large; therefore the run-off flow must
III. OPERATION STAGE

COMPONENTS 1 AND 2

Water quality of Long Binh river

Waste water discharges to receiving waters in project areas:
The water quality of the Long Binh River can be impacted by
waste water discharges from household in the project area.
Household waste water will be pretreated by septic tanks
before discharge into Long Binh river through outlets along
this river. The capacity of Long Binh River to assimilate
waste water is calculated according to the guidance in
Circular No. 02/2009 / TT-BTNMT on 19/03/2009.
The calculation assumes wastewater effluent is discharged by
one outlet and using the average value of river water quality
in Long Binh based on results of project's analysis.
Calculated results are as follows: Ability of the receiving to
assimilate wastewater

<table>
<thead>
<tr>
<th>Parameters</th>
<th>BOD₅</th>
<th>COD</th>
<th>TSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lₜn (kg/day)</td>
<td>8.357</td>
<td>12.563</td>
<td>49.976</td>
</tr>
<tr>
<td>Forecasted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C (mg/l)*</td>
<td>12.96</td>
<td>31.90</td>
<td>27.83</td>
</tr>
<tr>
<td>QCVN 08:2008/BTNMT (B2) (mg/l)</td>
<td>25</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

(*) C (mg/l) is calculated by followed formula:

\[ C_{(mg/l)} = \frac{(C_1 \times V_1 + C_2 \times V_2)}{(V_1 + V_2)} \]

The Lₜn indicators for pollutants are > 0 and calculated
results for BOD₅, COD and TSS concentrations still meet the
VN Standard; therefore Long Binh River has the assimilative
capacity to receive wastewater from the upgraded areas of the
project. After receiving pollutants loads from upgraded areas,
water quality of the Long Binh river is still comply with
column B QCVN 08:2008/BTNMT.

COMPONENT 3

Resettlement site

Impact on greening area:
The construction of the project resettlement site of the project
will result in a loss of green area. The current status of land
use is mostly agricultural; over 90% of the area is abandoned
rice fields, and trees of two main types: water coconut on the
banks Ben Xuong creek, and coconut and mango fruit.
The land cleared for the resettlement area contains 1600m²
garden plants and 5,000m² water coconut area along the
banks of Ben Xuong creek. The total area of vegetation that
will be affected is 6,600 m²
However, since these trees are not protected species, the
impact is not high. Loss of these trees can be mitigated by
planting trees and greenery in other parts of the resettlement
area.
Wastewater from resettlement area:
Wastewater from the resettlement area will be mainly domestic along with wastewater from activities such trade, service, public works, commerce, schools.
The expected population of the resettlement area is 1,000, with designed demand for water usage of 150 liters/person/day. As a result, the wastewater volume of the entire area is estimated at 80% of supply water or 120 m³/day.

Using standard wastewater pollution coefficients for developing countries, the pollution concentrations are calculated as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Concentration (mg/l)</th>
<th>Post-septic tank concentration (mg/l)</th>
<th>QCVN 14:2008 (B) (mg/l)</th>
<th>Wastewater quality of WB's EHS guideline (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD:</td>
<td>288.46 – 346.15</td>
<td>173.1 – 207.7</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>COD:</td>
<td>461.54 – 553.85</td>
<td>276.9 – 332.3</td>
<td>100</td>
<td>125</td>
</tr>
<tr>
<td>SS:</td>
<td>738.46 – 886.15</td>
<td>443.1 – 531.7</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

Above calculations show that the concentration of pollutants in domestic wastewater exceeded Vietnam QCVN 14:2008/BTNMT (B) and wastewater quality of World Bank's EHS Guideline. If wastewater isn't treated in a central treatment system, the discharges will cause negative impacts to water resources of Ben Xuong creek.
Summary of EIA and EMP
Mekong Delta region Urban Upgrading Project (MDR-UUP) - Tra Vinh city Sub-project

3.3. Socio-economic Impacts

*Land Acquisition and Resettlement*

Land acquisition and resettlement will be involved in wards and communes 1, 2, 4, 5, 6, 7, 8, and 9.

Detailed information regarding the nature and scale of the impacts and proposed mitigation measures are provided in the “Resettlement Plan” (RP) report which was prepared separately. There are no indigenous people affected by the Tra Vinh City subproject.

*Other social impacts*

Other potential social impacts on local communities include those relating to transportation, road safety or public safety, or disruptions of communities during site clearance, construction, and operation.

3.4. Potential Impacts on Physical Cultural Resources (PCR)

The project will relocate 15 graves. Detailed measures to protect PCR resources have been prepared as required by the WB’s safeguard policy on PCR (OP/BP 4.11).

3.5. Cumulative Impacts

3.5.1. Cumulative Impacts assessment of related projects

Presently, there are some projects in Tra Vinh city related to the Urban Upgrading Project. The project with the most connection to Urban Upgrading Project is the wastewater treatment plant project funded under German ODA. The information of this ODA project is as follows:

1. Drainage system

- Construction of a ring sewer line (Bach Dang Street) to collect wastewater and storm water in the central area of the city.
- Rehabilitation and extension of existing sewers, ditch lines, branch ditch lines on Quang Trung, Ly Tu Trong, Nam Ky Khoi Nghia – Doc Lap, Pham Hong Thai, Tran Quoc Tuan, Tran Phu, Nguyen Dang routes. Construction of a trunk sewer - reinforced concrete circular sewer lines.
- Construction of two (02) separate collection well systems:
  - The Northern well will collect wastewater from inner urban areas.
  - The Southern wells will collect wastewater from the southern part of the city; storm water will directly discharge into the Long Binh River through outlets.
- Domestic wastewater will be separated and pumped to the wastewater treatment plant located along Hung Vuong Street, far from the central city area and final effluent is discharged into the Co Chien River.
- To lessen sewer depth and increase drainage capacity, it is necessary to build pump lift stations with capacity and location as follows:
  - Pumping station 1: Q = 9,600 m³/day placed at Ly Thuong Kiet Street
  - Pumping station 2: Q = 3,015 m³/day placed at Doc Lap Street
  - Pumping station 3: Q = 5,146 m³/day placed at Nguyen Dang Street.
Summary of EIA and EMP
Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project

2. Sewerage system

- All wastewater will be separated and collected into two (02) wastewater pumping stations located in the northern part of the city with a capacity of 6,400 m³/day and in the southern part of the city with a capacity of 15,000 m³/day, adjacent to the Long Binh River.

- Sewer and ditch lines in the central area will be fabricated using reinforced concrete circular sewers with diameter of \( B = 150-600 \) mm. All wastewater will be collected and pumped to the treatment plant located in the southern part of the city (capacity of 15,000 m³/day).

3. Wastewater Treatment Plant

A wastewater treatment plant with a capacity of 10,000 m³/day will be sponsored by KFW, and local funds will be used to build the plant covering the inner city area.

**Expected implement time for WWTP:** The Department of Natural Resources and Environment Tra Vinh has approved the EIA reports in 2009, and construction is scheduled to begin in July 2012 for operation in 2014-2015.

4. The relation with UUP Project: This project has different water-collecting basin than the UUP - Tra Vinh City sub-project. Wastewater from households in UUP project area will not be treated in the wastewater treatment plant funded by KFW.

Based on above information, the cumulative impact between these two (02) projects is as follows:

- **Impacts in construction period:**

  Because both construction periods may occur simultaneously, cumulative negative impacts may be as follows:

  - The establishment of drainage route construction blockhouses for both projects may impact the urban landscape and affect traffic safety.
  
  - Both projects will result in increased heavy traffic flow for supporting construction activities increasing the traffic density in city road.
  
  - Both projects will have construction in the areas of wards 1, 2 and 4, which may impact businesses and households and in these areas.

- **Impact in operation period**

  During the operation period, integrated impacts between these two (02) projects are:

  - If the German ODA wastewater treatment plant project is not built on schedule then wastewater from the sub-project areas of Tra Vinh city will be discharged untreated into the Long Binh River. This will increase concentrations of pollutants in Long Binh River. However, since the Long Binh River has only to comply with level B2 water quality standards, the river has the capacity to wastewater from the two (02) projects.

  - In case that the German ODA wastewater treatment plant is put into operation on schedule, then wastewater from project area households will be treated and will comply with the discharge standard QCVN 14:2008/BTNMT. The pollution discharge load to the Long Binh River will be decreased by about 80% due to the German ODA project.
Details of the due diligence work is shown below.

<table>
<thead>
<tr>
<th>Sub-project Name</th>
<th>Drainage and sewerage system and WWTP (German ODA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td><strong>Scope of work:</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1. Drainage system</strong></td>
</tr>
<tr>
<td></td>
<td>• Construction of a ring sewer line (Bach Dang Street) to collect wastewater and storm water in the central area of the city.</td>
</tr>
<tr>
<td></td>
<td>• Rehabilitation and extension of existing sewers, ditch lines, branch ditch lines on Quant Trung, Ly Tu Trong, Nam Ky Khoi Nghia – Doc Lap, Pham Hong Thai, Tran Quoc Tuan, Tran Phu, Nguyen Dang routes. Construction of a trunk sewer - reinforced concrete circular sewer lines.</td>
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<td></td>
<td>• Construction of two (02) separate collection well systems:</td>
</tr>
<tr>
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<td>+ The Northern well will collect wastewater from inner urban areas.</td>
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<td></td>
<td>• Domestic wastewater will be separated and pumped to the wastewater treatment plant located along Hung Vuong street, far from the central city area and final effluent is discharged into the Co Chien River.</td>
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<td></td>
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<td>+ Pumping station 1: Q = 9,600 m3/day placed at Ly Thuong Kiet Street</td>
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<td>+ Pumping station 3: Q = 5,146 m3/day placed at Nguyen Dang Street.</td>
</tr>
<tr>
<td></td>
<td><strong>2. Sewerage system</strong></td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Sewer and ditch lines in the central area will be fabricated using reinforced concrete circular sewers with diameter of B = 150-600 mm. All wastewater will be collected and pumped to the treatment plant located in the southern part of the city (capacity of 15,000 m3/day).</td>
</tr>
<tr>
<td></td>
<td><strong>3. Wastewater Treatment Plant</strong></td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Relationship with MDR-UUP:</strong></td>
</tr>
</tbody>
</table>
|                  | This project has different water-collecting basin than the MDR-UUP - Tra Vinh City sub-project. Hence there is no direct relationship except that this WWTP will also improve the
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

<table>
<thead>
<tr>
<th>Assessment of cumulative impact</th>
<th>Environmental quality of the city. Wastewater from households in UUP project area will not be treated in the wastewater treatment plant funded by KfW.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources of Financing:</td>
<td>KfW</td>
</tr>
<tr>
<td>Status</td>
<td>Construction phase is scheduled to begin in July 2012 or later</td>
</tr>
<tr>
<td>Status of EIA</td>
<td>EIA report approved by DONRE.</td>
</tr>
<tr>
<td>Detail of EMP</td>
<td>Detail EMP is not available. EMP is included in EIA.</td>
</tr>
<tr>
<td>Sources of Financing:</td>
<td>KfW</td>
</tr>
</tbody>
</table>

#### Impacts in construction period:

- The establishment of drainage route construction blockhouses for both projects may impact the urban landscape and affect traffic safety.
- Both projects will result in increased heavy traffic flow for supporting construction activities increasing the traffic density in city road.
- Both projects will have construction in the areas of wards 1, 2 and 4, which may impact businesses and households and in these areas.

#### Impact in operation period

During the operation period, integrated impacts between these two (02) projects are:

- If the German ODA wastewater treatment plant project is not built on schedule then wastewater from centre of Tra Vinh city will be discharged untreated into the Long Binh River. This will increase concentrations of pollutants in Long Binh river. However, since the Long Binh River has only to comply with level B2 water quality standards, the river has the capacity to wastewater from the two (02) projects.
- In case that the German ODA wastewater treatment plant is put into operation on schedule, then wastewater from project area households will be treated and will comply with the discharge standard QCVN 14:2008/BTNMT. The pollution discharge load to the Long Binh River will be decreased by about 80% due to the German ODA project.

#### Recommendation

Implementing mitigation measures during construction, specifically at LIAs and routes adjacent with German ODA project.
3.5.2. Cumulative Impacts due to sand exploitation supplying the Tra Vinh Subproject

The project’s high demand for sand, about 300,000 m³, may prolong illegal sand exploitation on Co Chien River due to competition for sand resources. Therefore, it is necessary to have procurement measures in place to closely monitor supply sources of the contractors. The illegal sand exploitation along Co Chien River route will result in riverbank instability, causing erosion of riversides.

3.5.3. Cumulative Impacts between components of the project

Because the construction periods for some components items may occur simultaneously, the following negative cumulative impacts are possible:

- Inhabitants in LIA 1 and a route entering to LIA 1 area
- Residential area at the road entering to the resettlement area will be impacted by activities of ditch embankment and construction of the resettlement area.
- Inhabitants at connection points between sewer lines of component 1 and component 2.

These cumulative impacts will increase concentration of dust pollution, noise and traffic safety at above mentioned areas.

The other ancillary facility is the Luong Hoa sanitary landfill, which will serve as the disposal site for the dredged materials and solid wastes generated by the MDR-UUP. The results of the due diligence work is shown below, including cumulative impacts.

<table>
<thead>
<tr>
<th>Sub-project Name</th>
<th>Luong Hoa sanitary landfill project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td><strong>Scope of work</strong></td>
</tr>
<tr>
<td></td>
<td>The existing Luong Hoa landfill site located at Chau Thanh suburban district, far away from the city 7km (towards Tieu Can). This site will be upgraded to sanitary landfill. The area of existing landfill is 3 ha. The scale of new sanitary landfill is about 10ha. Tra Vinh Urban Work Co., Ltd uses vehicles such as lorry, crane truck, dozer to transport solid waste to the landfilling site. <strong>Relationship with UUP-MDR project:</strong> Contaminated dredged material generated from UUP activities will be disposed in Luong Hoa sanitary landfill. <strong>Sources of Financing</strong> State funded</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>The existing landfill opened since 2000, it is estimated that it can receive solid waste collected from Tra Vinh city until 2014, while the new sanitary landfill project will put into operation in 2013 or later.</td>
</tr>
<tr>
<td><strong>Status of EIA</strong></td>
<td>EIA report of Luong Hoa upgrading landfill project was approved by DONRE in 2010. For a sanitary landfill, in operation phase, leachate, gas emission and bad odor are the important environmental issues need to be considered.</td>
</tr>
<tr>
<td><strong>Detail of EMP</strong></td>
<td>The treatment process of dredged organic sludge in this landfill is as below:</td>
</tr>
</tbody>
</table>
Summary of EIA and EMP

_Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project_

| Assessment of cumulative impact | Construction waste, solid waste and inorganic wastes e.g. brick, concrete, stone, excavated materials from Tra Vinh City UUP will be used for land leveling. For dredged materials from Ben Xuong canal with estimated value of 1000 m3 need to be dumped at Luong Hoa landfill site. According to the analysis results of heavy metals in sludge of the bottom of Ben Xuong creek, it shows that the quality of sludge of Ben Xuong creek meet the QCVN 03:2008/BTNMT applied for leveling material for industrial zone, so the sludge can be disposed in Luong Hoa landfill site as domestic solid waste. As calculated, at least 1000 m3 sludge equal to 20 of 5m3-trucks per day (estimated dredging time is 50 days) need to be transported to landfill and it will not put the landfill in overload. |
| Recommendation | Dredging activity must follow Dredged Materials Management Plan (DMMP) for Contaminated Sludge (exceed limited value of QCVN 07:2009/BTNMT). In case finding out contaminated sludge from Ben Xuong Canal, it must be disposed in separated cell as for hazardous waste. |
4 - MITIGATION MEASURE

This chapter identifies measures to mitigate the key negative project impacts during construction (which include site clearance, ground leveling, and construction) and operation. Given that most key impacts will occur due to civil works and transportation of construction/waste materials, many of the potential negative impacts on physical, biological, and social environment can usually be mitigated through a set of general measures that are typically applied to construction projects to minimize impacts such as noise, dust, traffic disruption, wastewater generation, etc. As part of the Environmental Management Plan (EMP) for the project these general measures have been transformed into a set of standard environmental specification that will be incorporated into all bidding and contract documents of the project. These measures are referred to as Environmental Codes of Practice (ECOPs), and they will be applied to mitigate typical and general impacts of the project's civil works. The scope and content of the ECOPs are presented below.

ECOPs are a set of actions and measures to mitigate the general negative impacts during construction. They describe typical actions to be taken by contractors, supervised by the construction supervision consultants (CSC) during construction, and monitored by the communities and the Independent Environmental Monitoring Consultant (IEMC). These ECOPs also cover the applicable provisions under Section 4.0 on Construction and Decommissioning of the IFC-World Bank Group Guidelines for Environmental, Health, and Safety (EHS). The detailed ECOPs will be incorporated into the bidding and contract documents (BD/CD) during the detailed design stage. The scope and content of the ECOPs is limited to construction activities for small and medium-size contract works. The impacts of such works are of limited extent, are temporary and reversible, and can be managed readily with good construction practices.

The ECOP measures identify typical mitigation actions for the following types of impacts:

- Dust generation
- Air pollution
- Impacts from noise and vibrations
- Water pollution
- Drainage and sedimentation control
- Management of stockpiles, quarries, and borrow pits
- Solid waste management
- Management of dredged materials
- Disruption of vegetative covers and ecological resources
- Traffic management
- Interruption of utility services
- Restoration of affected areas
- Workers' and public safety
- Communication with local communities
- Chance finds of cultural or archeological artifacts

The detailed ECOPs (Annex 1) are cross-referenced to the respective equivalent Vietnamese regulations, standards, and codes of practice.

If impacts require site-specific mitigation measures that are not adequately covered in these generic ECOPs, they must be addressed separately in the EMP. For example, the above ECOPs do not cover impacts from worker camps - assuming they would not generally be
Summary of EIA and EMP

Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project

needed for small urban works projects – and impacts from large works, such as dams, bridges, tunnels, and major roads. The ECOPs cover small dredging operations; however, operations generating very large amounts, or seriously contaminated, sludge would need to be handled through a separate set of measures outside of the scope of these ECOPs, such as in a dredging and materials management plan (DMMP – Annex 2). Social impacts caused by involuntary resettlement or involving ethnic minorities are addressed in other safeguard instruments.
5 – MANAGEMENT AND MONITORING PROGRAM

Prepared as a part of the EIA, an Environmental Management Plan (EMP) is a safeguards instrument that is typically used in many projects. It consists of information on, and guidance for, the process of mitigating and managing adverse environmental impacts throughout project implementation. Typically in Vietnam, an EMP comprises a list of typical mitigation measures to be carried out by contractors and others, an environmental monitoring program, capacity building, organizational arrangements and responsibilities, and the estimated cost of EMP implementation and monitoring.

There is a comprehensive regulatory framework in Vietnam related to EIA preparation, environmental standards, protection and management of forests and cultural property, and other aspects related to construction and operation of facilities and infrastructures in Vietnam. This EMP is consistent with these regulations.

To facilitate effective implementation of the EMP, the PPMU will: (a) Establish an Environment and Social Unit (ESU) responsible for ensuring timely implementation of the EMP, including monitoring, reporting, and capacity building related to safeguards; (b) Assign the Construction Supervision Consultant (CSC) to also be responsible for supervision of the contractor’s safeguard performance as part of the construction contract and this requirement will be included in the CSC’s terms of reference; and (c) One Independent Environmental Monitoring Consultant (IEMC) is hired by PMU-MOC to assist the ESUs in performing its task.

Tra Vinh City Water Supply Company, URENCO, and the Department of Transport will be responsible for implementation of the mitigation measures during the operation stage of the project and they will ensure that the mitigation measures are implemented and adequate budget is provided. The Provincial Steering Committee (PSC) chaired by the Chairman or Vice Chairman of the Provincial People’s Committee (PCP) will provide the overall policy guidance and oversight of the project implementation. Roles and responsibilities of the specialized agencies and the Departments of Planning and Investment and Natural Resources and Environment (DONRE) will also be critical.

There are two main parts to this EMP. First; the City will use Urban Construction Environmental Codes of Practice (ECOPs) for urban construction works. Environmental codes of practice (ECOPs) are mitigation measures for generic impacts from project activities during the construction phase; they must be included in the bidding documents as requirements directed to the construction contractor. ECOPs are not a formally recognized World Bank safeguards instrument but their use, as part of an EMP, is a convenient and effective way to ensure that the main generic, common and typical construction impacts are adequately mitigated during project implementation.

If impacts require site-specific mitigation measures that are not adequately covered in these generic ECOPs, they will be addressed separately in the EMP. These ECOPs also do not cover impacts (i) from worker camps (camps will not be needed for small and medium urban infrastructure projects), (ii) from large works, such as dams, tunnels, large road and bridge projects (which are not part of this project). Social impacts caused by involuntary resettlement or involving ethnic minorities are addressed in other, social safeguard instruments. The ECOPs cover dredging operations producing relatively small amounts of sludge, whilst very
Summary of EIA and EMP
*Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project*

large amounts or seriously contaminated sludge would need to be handled through a separate set of procedures outside of the scope of these ECOPs.

Activities carried out to mitigate impacts due to land acquisition and resettlement is presented separate safeguard documents (in the RPF and RP); they will be carried out and monitored separately.

Also included in the EMP are related measures, above and beyond actual mitigation measures. This includes the PMUs’ EMP program, including capacity building and safeguard training; and environmental monitoring.

5.1. Environmental management program

5.1.1. Management of impact on project sites

Table 4 presents site-specific impacts and mitigation measures that are not fully addressed through the application of ECOPs. This may be because the impact is not a typical one and is not included in the ECOPs, because the severity of the impact goes beyond the scope of the mitigation measures in the ECOPs, or because simply of the very specific nature of the mitigation measure that is needed.

Table 4: Site Specific Impacts and Mitigation Measures

<table>
<thead>
<tr>
<th>COMPONENT 1: BASIC INFRASTRUCTURE UPGRADING AND SERVICE IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction</strong></td>
</tr>
<tr>
<td>Impact: Land acquisition and resettlement</td>
</tr>
<tr>
<td>Mitigation: Implementation of approved RP in accordance with its provisions</td>
</tr>
<tr>
<td>Implementation mechanisms: Approved RP</td>
</tr>
<tr>
<td>Responsibility: PMU</td>
</tr>
<tr>
<td>Fund source: City</td>
</tr>
<tr>
<td>Monitoring: Independent Monitoring Consultant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITE SPECIFIC: LIAs AT WARDS 1, 2, 4, 5 AND 6 WITH FEATURE OF SMALL ALLEY, CROWDED HOUSEHOLDS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater pumped from areas under construction: Using pump to discharge wastewater due to stagnant storm water at channels of construction site or domestic wastewater can exist from some households in area discharging into the nearest existing sewer lines in the area to limit water stagnancy in construction site causing insanitation (fly, mosquito, odor and so on)</td>
<td></td>
</tr>
<tr>
<td>Domestic wastewater of construction workers: Not building tents and establishing separate toilets, the contractor will hire private houses in the area for workers to use toilets and bathrooms.</td>
<td></td>
</tr>
</tbody>
</table>

| Implementation mechanisms: | Contract conditions, supplementing those of the ECOPs |
| Responsibility: | Contractor |
| Fund source: | IDA Credit |
| Monitoring: | Supervision Consultant/PMU |

| SITE SPECIFIC: LIAs No. 3, 5, 6, 9, 13, 15, 18, 23 |

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts due to construction of upgraded alley routes adjacent to sensitive works</td>
<td></td>
</tr>
</tbody>
</table>

| Monitoring: | Informing construction period and complying with construction time |

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
**Summary of EIA and EMP**

Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project

<table>
<thead>
<tr>
<th>Implementation mechanisms:</th>
<th>Contract conditions, supplementing those of the ECOPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility:</td>
<td>Contractor</td>
</tr>
<tr>
<td>Fund source:</td>
<td>IDA Credit</td>
</tr>
<tr>
<td>Monitoring:</td>
<td>Supervision Consultant/PMU</td>
</tr>
</tbody>
</table>

**Operation**

**Impacts:** Inadequate attention to drainage and waste management

**Mitigation:**
- Frequently making sanitation for road to reduce the amount of generating dust in case of transportation means.
- Limit heavy lorries running into upgraded alley areas, waste collection vehicle in the area must meet sanitary standard, having cover, and not pour leachate.
- Propagandizing, encouraging people along two (02) roadsides to build septic tanks for preliminary wastewater treatment before connecting into the common collection system of the project.
- Encouraging households to grow green trees in vicinity of their houses.
- Equipping 200 public garbage cans with capacity from 120 to 200L, type of garbage cans with covers, waterproofing and anti-infection.
- Equipping 100 handbarrows to collect wastes for upgraded quarters.
- Households will self-equip garbage cans at their households and gather wastes in collection vehicles daily.

<table>
<thead>
<tr>
<th>Implementation mechanisms:</th>
<th>City Operations and Maintenance Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility:</td>
<td>City</td>
</tr>
<tr>
<td>Fund source:</td>
<td>City</td>
</tr>
<tr>
<td>Monitoring:</td>
<td>City</td>
</tr>
</tbody>
</table>

**COMPONENT 2: UPGRAADING SECONDARY INFRASTRUCTURE**

**Pre-Construction**

**Impact:** Land acquisition and resettlement

**Mitigation:** Implementation of approved RP in accordance with its provisions

**Implementation mechanisms:** Approved RP

<table>
<thead>
<tr>
<th>Responsibility:</th>
<th>PMU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fund source:</td>
<td>City</td>
</tr>
<tr>
<td>Monitoring:</td>
<td>Independent Monitoring Consultant</td>
</tr>
</tbody>
</table>

**Construction**

**SUBCOMPONENT: BEN XUONG EMBANKMENT**

**Impacts:**
- Pollution due to dredging activities in Ben Xuong Creek.
- Hazardous solid waste leakage possibility (lubricating oil of dredging means, building material, sludge transportation means)

**Mitigation:**
- Establishing isolated fence for the whole route (500m*2 routes)
- Controlling closely dredging procedure: Separating organic polluted dirt part with rock layer at the bottom of ditch.
- The polluted dirt layer is centralized in a separate region on the bank or on barge for dewater (creating drain towards canal), thence using
covered five-ton truck in accordance with regulations and transporting to the land filling site of Tra Vinh City. The amount of waste is about 1,000 m³ so the land filling site must have enough capacity to meet the volume of wastes (according to consultancy of Tra Vinh Urban Environmental Co., Ltd and DONRE, the sludge will be treated at the Luong Hoa Landfill, Luong Hoa commune, Chau Thanh suburban district)

- Soil dredged at the bottom of canal has no pollution compositions must be concentrated along two (02) sides for dewater and transporting to the leveling areas.

### Implementation mechanisms:
Contract conditions, supplementing those of the ECOPs

### Responsibility:
Contractor

### Fund source:
IDA Credit

### Monitoring:
Supervision Consultant/PMU

### SUBCOMPONENT: CONSTRUCTING DRAINAGE SYSTEM ON LE VAN TAM ROAD.

### Impacts
Impacts due to construction of sewer lines on Le Van Tam Street, Son Thong Street and the National Highway No.53.

### Mitigation:
- Informing construction time at areas of sensitive works
- Implementing in accordance with construction progress as commitment,
- Before carrying out road excavation, construction unit must have caution boards, beacon lights and labor safety and traffic safety guarantee measures in accordance with regulations.
- Construction of box culvert: Installing mobile metal fencing walls with minimum height of 3m to avoid generating dust and fencing for safety corridor.
- Watering twice/day along fencing walls of culvert construction site.
- Absolutely warning workers to go toilets in accordance with stipulated places.
- Clean sanitation at construction site
- Solid waste collection along routes of the work
- Limiting use of high-noise generating equipment at gate of pagoda

### Implementation mechanisms:
Contract conditions, specifications, supplementing those of the ECOPs

### Responsibility:
Contractor/detailed design consultant

### Fund source:
IDA Credit

### Monitoring:
Supervision Consultant/PMU

### Operation

### Impacts
Pollution of surface water

### Mitigation:
- Establishing the group of frequent road work sanitation and management avoid storm water overflowing and sweeping away solid wastes into surface water sources.
- Encouraging and requesting people to treat wastewater partially by three (03)-compartment septic tank to meet the standard before discharging into the common sewer.
- Frequently dredging canals, not stagnant water, overflowing on surface causing influences to landscape and sanitation in the project site.

### Implementation mechanisms:
City Operations and Maintenance Plan

### Responsibility:
City

### Fund source:
City

### Monitoring:
City

### COMPONENT 3: RESETTLEMENT SITE
### Pre-Construction

<table>
<thead>
<tr>
<th>Impact</th>
<th>Land acquisition and resettlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation</td>
<td>Implement approved RP in accordance with its provisions</td>
</tr>
<tr>
<td>Implementation mechanisms</td>
<td>Approved RP</td>
</tr>
<tr>
<td>Responsibility</td>
<td>PMU</td>
</tr>
<tr>
<td>Fund source</td>
<td>City</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Independent Monitoring Consultant</td>
</tr>
</tbody>
</table>

### Construction

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Impacts due to leveling and ground lift</th>
<th>Impacts due to temporary inundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation</td>
<td>Using aggrandizement sand meeting the quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not using latent alkaline land use (pH&lt;5) as aggrandizement material.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biomass of vegetation cover must be collected absolutely after using-valuable timbers are gathered and collected, it is necessary to make a contract with Tra Vinh Urban Work company.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>According to topographical survey, drainage direction in the area of 20 ha of the resettlement area of the city is no clear drainage direction. Therefore, it is necessary to have rectification measures in and around the resettlement area the most logically.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excavating ditch, canal for temporary drainage to limit inundation in construction period.</td>
<td></td>
</tr>
<tr>
<td>Implementation mechanisms</td>
<td>Contract conditions, specifications supplementing those of the ECOPs</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Fund source</td>
<td>IDA Credit</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td>Supervision Consultant/PMU</td>
<td></td>
</tr>
</tbody>
</table>

### Impacts

<table>
<thead>
<tr>
<th>Illegal sand exploitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Implementation mechanisms</td>
</tr>
<tr>
<td>Responsibility</td>
</tr>
<tr>
<td>Fund source</td>
</tr>
<tr>
<td>Monitoring</td>
</tr>
</tbody>
</table>

### Operation

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Wastewater generated from resettlement site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation</td>
<td>Preliminary domestic wastewater treatment</td>
</tr>
<tr>
<td></td>
<td>• Wastewater from toilets at dwellings, school and supermarket, grocery will be treated partially by three-compartment septic tank.</td>
</tr>
<tr>
<td></td>
<td>• Canteen areas (at supermarkets) or other eating and drinking areas will be treated partially by oily grease separating basin</td>
</tr>
<tr>
<td></td>
<td>• Concentrated wastewater treatment system</td>
</tr>
</tbody>
</table>

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
Summary of EIA and EMP

Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project

<table>
<thead>
<tr>
<th>Implementation mechanisms:</th>
<th>City operations and maintenance plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility:</td>
<td>City</td>
</tr>
<tr>
<td>Fund source:</td>
<td>City</td>
</tr>
<tr>
<td>Monitoring:</td>
<td>City</td>
</tr>
</tbody>
</table>

Wastewater treatment technology of the resettlement area is proposed as follows:
- Wastewater after the septic tank of household → wastewater collection network → screen bar → grit chamber → equalizing tank → aerobic biological tank → sedimentation tank 2 → disinfection tank → receiving body.
- Sludge from wastewater treatment station → sludge thickener tank → sludge thickener → land filling

Total capacity of 600 m³/day will be invested following each module with capacity of 200 m³/day for a modulus
After-treated wastewater will meet QCVN 14:2008/BTNMT, class B

5.1.2. Management of Impacts on Physical Cultural Resources

(a) Gravestones relocation

Based on the EIA study and the preparation of the RP, about 15 graves will be relocated for the Tra Vinh subproject. The mitigation measures are proposed as below:
- The investment owner must contact with relatives of gravestones for having alternatives for compensation and exhumation
- Making an agreement on providing a separate land in the cemetery of the city with amount of 15 gravestones for gravestones' family to relocate those graves to here.
- Compensating logical expenditure for relocation, re-construction of graves

(b) Chance Find Procedures

These specific procedures are to be followed in case of archeological, cultural or similar finds of artifacts or relics. The diagram below identifies the detailed steps to be taken. The PPMU will be responsible for the overall coordination and reporting. The chance find procedures will be included in all construction contracts and key staff and contractors will be trained on how to implement them.

---

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
5.2. Environment monitoring program

The Environmental Monitoring Program is a key element of the EMP. Its main objective is to check and ensure that (a) the potential negative impacts of the project are minimized; (b) the EMP is effectively implemented; and (c) the EMP is adequate to mitigate the potential negative impacts. Given that monitoring the implementation of the RP will be conducted separately, the environmental monitoring program will comprise (a) monitoring the safeguards performance of the contractors during site clearance and construction, (b) environmental quality monitoring, (c) monitoring the effectiveness of the EMP.

It is essential to design the monitoring program – in conjunction with the selected monitoring locations, parameters and frequencies – in such a manner to be able to record both, the overall performance of the project works as well as the short-term impacts due to construction activities. The environmental monitoring program will be implemented during construction at three levels:

- Monitoring the level of compliance with mitigation measures,
- Monitoring the environmental parameters set out in the EIAs for each of the works, and
- Community-based monitoring.

Monitoring of Contractor’s Safeguard Performance

Three levels of environmental safeguards monitoring will be implemented as follows:

- Routine monitoring: This will be done by the Construction Supervision Consultant (CSC) as assigned by the PPMUs. The CSC will include the environmental monitoring results in the monthly project progress reports.
- Periodic monitoring: This will be done every six months as part of the overall monitoring of the EMP implementation. The environmental and social unit (ESU) of the PPMUs, assisted by the Independent Environmental Monitoring Consultant (IEMC) will also monitor the contractor performance every six months and the results will be reported to the PPMUs and the WB.
- Community monitoring: Monitoring by local communities will be conducted following Government practices, with technical and management support from the PPMU.

To ensure an acceptable level of environmental quality, monitoring of dust, noise, vibration, air quality, and water quality will be made at project-specific locations that are likely to be most affected by the construction activities. Specific monitoring locations may also be requested by local authorities and/or communities for specific purposes. ESU/IEMC will have overall responsibility for the monitoring program.

The following are the key issues, criteria and scope of monitoring that will be taken into account in the implementation of the monitoring program:

- General Construction Impacts: local flooding; traffic congestion and/or disruption, especially in residential areas; air quality, and noise and dust levels in residential areas; surface water quality upstream and downstream of construction sites, with specific attention paid to impacts on local residents;
- Implementation of site-specific EMPs that require specific monitoring activities that are not covered by the ECOPs nor by the Vietnamese regulations, standards and
codes. Such monitoring activities will be as agreed with local agencies and communities during the preparation of the EMP and monitoring program.

- Implementation of Dredged Materials Management Plan (DMMP): for all sludge and similar material excavated from the project work sites that exceeds the national thresholds for toxic substances, a site-specific DMMP will be used. Amounts, levels of heavy metals, if any, locations and activities at disposal sites, and impacts on local residents will be monitored, based on a water quality monitoring plan with specific stations and parameters for monitoring impacts on other water users.

- Monitoring the Effectiveness of the EMP: The ESU assisted by IEMC will monitor the overall performance of the EMP implementation during the detailed design/bidding stage as well as during construction and the first year operation of the facilities to ensure that (a) appropriate dredging and disposal of drainage sludge is properly carried out, in accordance with the DMMP, (b) other impacts identified in the EMP are effectively managed and mitigated; (c) traffic management is adequate and the levels of impacts are acceptable, i.e. there are no new complaints nor any outstanding cases, and (d) all typical general impacts are mitigated in accordance with the ECOPs. Results are to be kept in the project file for possible review by PPMU and the WB. Cost for the monitoring will be part of the PPMU cost.

The following tables outline the parameters for the part of the monitoring program that is performed by sampling and testing air, soil/sediment, and water quality, and also measures noise levels and any other pertinent ambient parameters, if needed. Its estimated cost considering that some activities will be carried out: (i) before construction (project baseline environmental conditions), (ii) during construction (assumed to take five years), and (iii) during the first year of operation, detailed monitoring programs will be prepared during the detailed design stage. The estimated cost for monitoring forms part of the EMP costs; the costs for sampling and laboratory testing will be included in the CSCs’ contracts. Many of the parameters listed below are required by Vietnamese regulations and would need to be done even if they are not directly related to expected project impacts.

**Table 5: Scope of environmental monitoring**

<table>
<thead>
<tr>
<th>TT</th>
<th>Monitoring items</th>
<th>Pre-construction phase</th>
<th>Construction phase</th>
<th>Operation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Monitoring on air quality, noise and vibration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Monitoring parameters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component 2, 3.</td>
<td>TSP, SO2, NO2, CO, HC Noise and vibration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component 2, 3.</td>
<td>One occasion before construction Every three months Every six months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Location of sampling sites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component 2</td>
<td>- 02 sites for road to LIA 1 (01 site at Pham Thai Buong school) - 02 sites for Nguyen Dang expanded road - 02 sites for Ben Xuong embankment and road construction - 04 sites for drainage route construction</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

<table>
<thead>
<tr>
<th>TT</th>
<th>Monitoring items</th>
<th>Pre-construction phase</th>
<th>Construction phase</th>
<th>Operation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Component 3</td>
<td>03 sites at resettlement area</td>
<td>03 sites at resettlement area</td>
<td>03 sites at resettlement area</td>
</tr>
</tbody>
</table>

**4. Number of sampling times**

<table>
<thead>
<tr>
<th>Component 2</th>
<th>01 time</th>
<th>6 times in total</th>
<th>2 times in total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 3</td>
<td>01 time</td>
<td>6 times in total</td>
<td>2 times in total</td>
</tr>
</tbody>
</table>

**5. Applied standard**

QCVN 05:2009/BTNMT; QCVN 26:2010/BTNMT; QCVN 27:2010/BTNMT; World Bank Environmental, Health and Safety Guidelines

### II. Soil and sediment monitoring

1. **Monitoring parameters:**

<table>
<thead>
<tr>
<th>Component 2</th>
<th>As, Cd, Cu, Pb, Zn</th>
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</thead>
<tbody>
<tr>
<td>Component 3</td>
<td>As, Cd, Cu, Pb, Zn</td>
</tr>
</tbody>
</table>

2. **Frequence**

| Component 2, 3 | 01 time before construction | every 3 months | every six months |

3. **Number of samples**

<table>
<thead>
<tr>
<th>Component 2</th>
<th>01 sample of excavation soil of drainage system route. 02 samples dredged mud in Ben Xuong creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 3</td>
<td>2 samples in resettlement area</td>
</tr>
</tbody>
</table>

4. **Number of sampling time**

<table>
<thead>
<tr>
<th>Component 2</th>
<th>01 time</th>
<th>6 times in total</th>
<th>2 times in total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 3</td>
<td>01 time</td>
<td>6 times in total</td>
<td>2 times in total</td>
</tr>
</tbody>
</table>

5. **Applied standard**

QCVN 03:2008/BTNMT; World Bank Environmental, Health and Safety Guidelines

### III. Surface water quality

1. **Monitoring parameters**

pH, SS, BOD₅, COD, Turbidity, NO₂⁻, NO₃⁻, PO₄³⁻, DO, Zn, Cr, T-Coliform, Fecal-Coliform

2. **Frequence**

<table>
<thead>
<tr>
<th>Component 1 &amp; 2</th>
<th>01 time before construction</th>
<th>every 3 months</th>
<th>every 6 months</th>
</tr>
</thead>
</table>

3. **Sampling location**

- Ben Xuong creek: 03 sampling sites
- Long Binh river: 05 sampling sites

| Component 3 | Ben Xuong creek: 01 site |

4. **Number of sampling time**

<table>
<thead>
<tr>
<th>Component 1 &amp; 2</th>
<th>01 time</th>
<th>6 times in total</th>
<th>2 times in total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 3</td>
<td>01 time</td>
<td>6 times in total</td>
<td>2 times in total</td>
</tr>
</tbody>
</table>

5. **Applied standard**

QCVN 08:2008-BTNMT (B)

### IV. Groundwater monitoring

1. **Monitoring parameters**

pH, COD, TDS, NO₂⁻, Fe, Cl, T-Coliform, E-Coli

2. **Frequence**

<table>
<thead>
<tr>
<th>Component 1, 2, 3</th>
<th>01 time before construction</th>
<th>every three months</th>
<th>every 6 months</th>
</tr>
</thead>
</table>

3. **Sampling location**

Component 1, 2, 3: 3 wells of 3 households in residential area around Ben Xuong creek and resettlement site

PMU of Tra Vinh City Subproject

Consultant: Pacific Technology JS. Co. (PCO)
Summary of EIA and EMP
*Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project*

<table>
<thead>
<tr>
<th>TT</th>
<th>Monitoring items</th>
<th>Pre-construction phase</th>
<th>Construction phase</th>
<th>Operation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Number of sampling time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Component 1, 2, 3</td>
<td>01 time</td>
<td>06 times in total</td>
<td>2 time in total</td>
</tr>
<tr>
<td>5.</td>
<td>Applied standard</td>
<td>QCVN 09:2008-BTNMT; World Bank Environmental, Health and Safety Guidelines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Estimated number for soil, water, and air sampling and estimated cost for samples collection and analysis

<table>
<thead>
<tr>
<th>Construction Item</th>
<th>Road to LIA1</th>
<th>Nguyen Dang expanded road</th>
<th>Drainage route</th>
<th>Ben Xuong Embankment</th>
<th>Long Binh River</th>
<th>Resettlement site</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-construction period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total monitoring Times</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Air/Noise samples</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Total sludge/soil samples</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Total surface water samples</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Total ground water quality samples</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Construction period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total time of Construction</td>
<td>18</td>
<td>18</td>
<td>24</td>
<td>18</td>
<td>8</td>
<td>8</td>
<td>78</td>
</tr>
<tr>
<td>Total monitoring Times</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Air/Noise sample (1 time)</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<td>3</td>
<td>3</td>
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<tr>
<td>Sludge/Soil sample (1 time)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Surface water sample (1 time)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ground water sample (1 time)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total Air/Noise samples</td>
<td>12</td>
<td>12</td>
<td>24</td>
<td>12</td>
<td>0</td>
<td>18</td>
<td>78</td>
</tr>
<tr>
<td>Total sludge/soil samples</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>Total surface water samples</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>30</td>
<td>6</td>
<td>54</td>
</tr>
<tr>
<td>Total ground water quality samples</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td><strong>Operation period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total monitoring Times</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Air/Noise samples</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>26</td>
</tr>
<tr>
<td>Total sludge/soil Samples</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>12</td>
</tr>
</tbody>
</table>

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
Summary of EIA and EMP
Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project

| Total surface water samples | 0 | 0 | 0 | 3 | 5 | 1 | 18 |
| Total ground water quality samples | 0 | 0 | 0 | 0 | 0 | 3 | 6 |

Table 7: Estimated cost for samples collection and analysis

<table>
<thead>
<tr>
<th>No</th>
<th>Content</th>
<th>Unit</th>
<th>Quantity</th>
<th>Price (VND)</th>
<th>Total (VND)</th>
<th>Total (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-construction period</td>
<td>1</td>
<td>Air/Noise</td>
<td>Sample</td>
<td>13</td>
<td>1,900,000</td>
<td>24,700,000</td>
</tr>
<tr>
<td>2</td>
<td>Sludge/Soil</td>
<td>Sample</td>
<td>6</td>
<td>630,000</td>
<td>3,780,000</td>
<td>184</td>
</tr>
<tr>
<td>3</td>
<td>Surface water</td>
<td>Sample</td>
<td>9</td>
<td>910,000</td>
<td>8,190,000</td>
<td>400</td>
</tr>
<tr>
<td>4</td>
<td>Ground water</td>
<td>Sample</td>
<td>3</td>
<td>910,000</td>
<td>2,730,000</td>
<td>133</td>
</tr>
<tr>
<td>Construction period</td>
<td>1</td>
<td>Air/Noise</td>
<td>Sample</td>
<td>78</td>
<td>1,900,000</td>
<td>148,200,000</td>
</tr>
<tr>
<td>2</td>
<td>Sludge/Soil</td>
<td>Sample</td>
<td>36</td>
<td>630,000</td>
<td>22,680,000</td>
<td>1,106</td>
</tr>
<tr>
<td>3</td>
<td>Surface water</td>
<td>Sample</td>
<td>54</td>
<td>910,000</td>
<td>49,140,000</td>
<td>2,397</td>
</tr>
<tr>
<td>4</td>
<td>Ground water</td>
<td>Sample</td>
<td>18</td>
<td>910,000</td>
<td>16,380,000</td>
<td>799</td>
</tr>
<tr>
<td>Operation period</td>
<td>1</td>
<td>Air/Noise</td>
<td>Sample</td>
<td>26</td>
<td>1,900,000</td>
<td>49,400,000</td>
</tr>
<tr>
<td>2</td>
<td>Sludge/Soil</td>
<td>Sample</td>
<td>12</td>
<td>630,000</td>
<td>7,560,000</td>
<td>369</td>
</tr>
<tr>
<td>3</td>
<td>Surface water</td>
<td>Sample</td>
<td>18</td>
<td>910,000</td>
<td>16,380,000</td>
<td>799</td>
</tr>
<tr>
<td>4</td>
<td>Ground water</td>
<td>Sample</td>
<td>6</td>
<td>910,000</td>
<td>5,460,000</td>
<td>266</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>326,870,000</td>
<td>15,945</td>
</tr>
<tr>
<td>Total cost (after being rounded-up)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16,000</td>
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</tr>
</tbody>
</table>

Table 8: Basic cost for chemical analyses (Exchange rate: 1 USD = 20,500 VND)

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>Price (VND)</th>
<th>Quantity (Sample)</th>
<th>Total (VND)</th>
<th>Total (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Air/Noise sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>TSP</td>
<td>300,000</td>
<td>117</td>
<td>35,100,000</td>
<td>1,712</td>
</tr>
<tr>
<td>2</td>
<td>CO</td>
<td>300,000</td>
<td>117</td>
<td>35,100,000</td>
<td>1,712</td>
</tr>
<tr>
<td>3</td>
<td>NO2</td>
<td>300,000</td>
<td>117</td>
<td>35,100,000</td>
<td>1,712</td>
</tr>
<tr>
<td>4</td>
<td>SO2</td>
<td>300,000</td>
<td>117</td>
<td>35,100,000</td>
<td>1,712</td>
</tr>
<tr>
<td>5</td>
<td>HC</td>
<td>600,000</td>
<td>117</td>
<td>70,200,000</td>
<td>3,424</td>
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<tr>
<td>6</td>
<td>Noise</td>
<td>100,000</td>
<td>117</td>
<td>11,700,000</td>
<td>571</td>
</tr>
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<td>II</td>
<td>Surface/Ground water sample</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Temperature</td>
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<td>2,160,000</td>
<td>105</td>
</tr>
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<td>2</td>
<td>pH</td>
<td>40,000</td>
<td>108</td>
<td>4,320,000</td>
<td>211</td>
</tr>
<tr>
<td>3</td>
<td>DO</td>
<td>70,000</td>
<td>108</td>
<td>7,560,000</td>
<td>369</td>
</tr>
<tr>
<td>4</td>
<td>TSS</td>
<td>70,000</td>
<td>108</td>
<td>7,560,000</td>
<td>369</td>
</tr>
<tr>
<td>5</td>
<td>BOD5</td>
<td>120,000</td>
<td>108</td>
<td>12,960,000</td>
<td>632</td>
</tr>
</tbody>
</table>
5.3. Role and Responsibilities for EMP Implementation

5.3.1. Organization Arrangement

The Project Management Unit (PMU-MOC) in the Ministry of Construction (MoC) will be responsible for the overall consolidated monitoring and quality assurance of the Project. While Cities are responsible for EMP implementation, the PMU-MOC will have a quality assurance and monitoring role including all safeguards aspects. The Cities will submit all safeguards progress and monitoring reports to the PMU-MOC. The MoC will also be responsible for contracting and managing the Independent Environmental Monitoring Consultant (IEMC) who will monitor the environmental performance in all six project cities. The IEMC's costs are therefore part of the MoC budget, and not do not form part of the cities' EMP implementation costs. The figure and subsequent table below summarize the roles and responsibilities of the key parties and their relationships with regard to the implementation of the EMP. The roles and responsibilities of the ESU, PPMUs, CSC, and IEMC are outlined below:

- Contractors have the main responsibility for implementing mitigation measures. Those measures will be included in the bidding documents and the costs are to be included in their bids and the construction contracts.
- CSC is responsible for supervising and monitoring the day-to-day implementation of mitigation measures. The associated costs are included in CSC service contracts.
- IEMC will be responsible for environmental monitoring which includes (i) support to the ESU/PPMU for implementing supervision and monitoring, and (ii) reporting on the implementation through periodic monitoring reports.
Figure 3. Organization Diagram for the EMP Implementation

Table 9: Roles and responsibilities of key parties (referring to above figure)

<table>
<thead>
<tr>
<th>Links</th>
<th>Description of Roles and Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1a)</td>
<td>Based on quarterly reports of IEMC, PMU-MOC is responsible for preparing periodic reports to submit to the WB.</td>
</tr>
<tr>
<td>(1b)</td>
<td>PMU-MOC send a notice to PPMU on working plan of IEMC, receive reports of IEMC and monitoring the implementation of agreed proposals and monitor the sending of the monthly report from the Safety policy officer to the PPMU</td>
</tr>
<tr>
<td>(1c)</td>
<td>PMU-MOC with the assistance of contracted IEMC, provide the guideline to and monitor the implementation of PPMU's EMP,</td>
</tr>
</tbody>
</table>
| (2a)  | PPMU assigns the safeguard staff (ESU) to review and check the environment-related sections in of the bidding and contract documents for appropriate items, such as the ECOPs, to ensure compliance with EMP.  
PPMU assigns the safeguards staff (ESU) to supervise, manage and carry out EMP activities and also assigns CSC to closely supervise and monitor safeguard performance of the contractor, including implementing the environmental monitoring program.  
PPMU/ESU establishes a hotline communication with the local community to be responsive to the complaints, comments, and/or recommendations from local people and the public throughout the site clearance and construction period. |
| (2b)  | Based on quarterly reports of IEMC, PPMU is responsible for preparing periodic reports to submit to the Provincial DONRE. |
| (2c)  | IEMC contracted by PMU-MOC supports PPMU/ESU to implement the EMP in line with Government's environmental regulations as well as the WB safeguard policies. In consultation with DONREs, IEMC will establish a specific environmental monitoring program for the project to be implemented by CSC at key locations as shown in the detailed design documents. |
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

| (3a) | Contractor: Before construction, with general guideline from IEMC, prepares a site-specific environment management plan (SEMP) during site clearance and construction process as part of their construction method statement, then submit it to CSC and/or PPMU for review and approval; During construction, the contractor has to submit a monthly report on safeguard issues, mitigation, and results throughout the construction period. In case of unexpected problem, the contractor will consult CSC/PPMU.  
PPMU/CSC: Reviews the SEMP and can propose change as deemed necessary to be in line with the contractual obligations as well as appropriate to each specific site. Daily supervision and monitoring of contractor’s safeguard performance will be responsibility of the CSC. |
| (3b) | CSC submits periodic monitoring reports of environmental mitigation measures to PPMU; recommends to the PPMU to suspend, in part or completely, construction work if it does not meet labor safety or environmental protection requirements of the contract.  
PPMU reviews CSC’s periodic reports to monitor compliance with mitigation measures. |
| (3c) | Community: According to Vietnamese practice, the community has the right and responsibility to routinely monitor environmental performance during construction to ensure that their rights and safety are adequately protected and that the mitigation measures are effectively implemented by contractors and/or PPMU. In case of unexpected problems, they will report to CSC/PPMU and/or call the hotline.  
PPMU: Encourage, support and create good conditions for local community to participate in the environmental supervision and monitoring activities. PPMU/CSC will review and response to the requests and/or recommendations made by community to ensure that the potential negative impacts are adequately mitigated. |
| (4a) | Contractor: Carries out the EMP as required during site clearance and construction, including conduct self-monitoring and submission of report.  
IEMC: periodically supervises and monitors the overall project EMP implementation including provision of safeguard training to PPMU/ESU staff, community, CSC, and contractors as needed. The training will be designed to enhance the effectiveness of the EMP implementation and reporting. |
| (4b) | Community: Support and collaborate with IEMC during periodic monitoring and provide inputs to the overall safeguard issues that require attention and/or mitigation.  
IEMC: Strengthen local community’s capacity and relevant agencies through preparation of relevant documents necessary for monitoring, supervision, and reporting including preparation of a database for the activities.  
IEMC: assist PPMU and communities for the implementation of Information-Education-Communication (IEC) activities within Component 4 with regard to environmental hygiene, sanitation, road safety, etc. |
| (4c) | CSC: Supports and collaborates with IEMC to establish, collect and highlight information about essential environmental parameters in the field, and information for construction implementation.  
IEMC: Monitors the implementation of the EMP every 3 months including submission of the field report. Creates database of results from environmental supervision and monitoring and training PPMU in use of such a database.  
IEMC: Coordinates with CSC for carrying out the monitoring activities and the preparing the safeguard reports on EMP performance; enhances the capacity of CSC staff through training programs in environmental supervision. |
5.3.2. Specific Responsibilities of PMU, CSC, and IEMC

City-level Project Management Units (PPMUs)

1. PPMUs are responsible for implementing the EMP during the detailed design and construction stages. EMP implementation during operation stage is the responsibility of the facilities' operators at the city level. PPMU will set up an Environmental and Social Unit (ESU) to ensure timely and effective implementation of the EMP, including preparation of reports on safeguard compliance as required by Government and WB.

   - PPMU/ESUs are responsible for ensuring that the relevant sections in the bidding and contract documents for all construction works are in compliance with the EMP; this means they contain the requirements of the ECOPs and site-specific EMPs.

   - PPMU/ESUs are responsible for communicating with relevant local, provincial and national departments; and with the agencies responsible for implementing and supervising EMP, especially with the provincial Department of Natural Resources and Environment (DONRE), and with the concerned wards/communes during planning, monitoring, management and operation.

   - PPMU/ESUs will coordinate with community organizations to encourage them to actively participate in the planning, management, and implementation of the project, including monitoring of the contractor's performance.

   - To ensure effective monitoring and timely implementation of the EMP, PPMU/ESUs will hire national environmental consultants to assist them with carrying out and monitoring the EMP implementation. Responsibilities of the Independent Environmental Monitoring Consultant (IEMC) are described further below.

   - In the course of supervising and monitoring the contractors' performance, PPMUs will be responsible for: (a) checking project implementation indicators relating to the environment; (b) conducting unscheduled, surprise inspections to ensure that mitigation measures are being implemented as required in construction contract by contractor; (c) reviewing the periodic reports of the construction supervision consultant (CSC) to ensure compliance with mitigation measures and EMPs; and (d) based on the periodic reports by CSC and IEMC, preparation of reports on environmental compliance of subprojects, to be submitted to WB and DONRE (this will be part of the submission of progress report to WB every six months).

   - PPMUs will coordinate closely with relevant city enterprises for water supply, environmental sanitation, and solid waste collection, to monitor their operation and maintenance activities during project implementation.

Construction Supervision Consultant (CSC)

The CSC is responsible for monitoring the safeguard performance of the contractors during site clearance and construction, including oversight of the self-monitoring to be conducted by contractor. With regard to environmental safeguards, the CSC's main responsibility will include, but not be limited to, the following:

   - Assist IEMC to establish, collect and provide information essential environmental indicators, on-site and for the construction works.

   - Ensure that all work comply with the approved EMPs, relevant environmental standards and codes of practice (ECOPs), as set out in documents for environmental impact mitigation and monitoring.
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- Monitor the implementation of mitigation measures by the contractors, propose and deploy any necessary supplementary measures in time to improve mitigation measures to fully meet the environmental management and safety requirements of project.
- Prepare action plans and/or propose urgent solutions to cope with environmental problems, emergency situations and damage that occurred during construction.
- Recommend to PPMUs to suspend partially or completely construction work if labor safety and environmental protection requirements of the contract are not being complied with.
- Organize regular discussions with relevant parties, agencies and other stakeholders to provide information about implementation plans to increase people’s awareness of the need for environmental protection and management during construction process.

*Construction Contractor*

The construction contractor’s responsibilities with respect to all aspects of the works, including the environmental aspects, are set out in the contract documents, signed with the PPMU.

- Construction contractors are responsible for carrying out environmental impact mitigation measures and for complying with the approved EMP when implementing construction contracts. When preparing the “technical method statement”, the contractor will study the project’s approved EIA report and propose a construction method that includes environmental mitigation and monitoring measures that are in line with the approved EMP.
- Contractor’s method statement will be submitted to PPMUs and CSC for review, as well as to IEMC, as deemed necessary. Changes, if any, will be evaluated for their feasibility and for legal issues (laws, decrees, circulars and other regulations) before suitable adjustments are approved for specific cases on-site.
- During the construction work, the construction contractors will be closely supervised by PPMUs, CSC, IEMC, environmental authorities and the local community for their compliance with the EMP.

*Independent Environmental Monitoring Consultant (IEMC)*

The IEMC will be responsible for assisting the PPMU with the EMP implementation. This also includes advising the CSC, contractors and communities on environmental compliance, and on carrying out the monitoring program in accordance with regulations, procedures and policies of the Government and the WB, respectively. After the detailed implementation of the environmental monitoring programs was discussed by the city-level PPMU and World Bank supervision staff, the IEMC will be responsible for quarterly checking, and for supporting the PPMU staff to supervise overall project activities to ensure that uniform environmental policies of the Government and World Bank are applied and supervised during project implementation. The IEMC will be responsible for: (1) providing training and capacity building for construction management PPMU/ESU staff, including field engineers and/or consultants (CSC), in supervising the EMP implementation by the contractors; (2) ensuring active participation of the local communities and schools in the project areas, (3) monitoring of environmental parameters to assess the overall impacts of the project, and (4) establish the environmental training program that is part of Component 4.

Specifically, the IEMC’s responsibilities include:
Ensuring that the approved EMP and all other relevant project legal agreements related to environmental safeguards are fully applied and complied with during project implementation.

Assessing the effectiveness of mitigation measures which are applied by contractors and CSC during project implementation; providing proposals and recommendations to the PPMUs on improvements needed to meet the safeguard requirements.

Reporting periodically (every 3 months) to the PPMUs on actual EMP performance during project implementation.

Establishing standard procedures, methods and forms to assist the PPMUs and CSC to assess contractors' progress in implementing the required impact mitigation and monitoring measures.

Assisting the PPMUs' environmental staff to review and check that relevant environmental sections (based on the ECOPs) have been included in the bid packages and construction contract documents to ensure compliance with environmental policies and impact mitigation and monitoring requirements.

Measuring, taking samples and monitoring periodically the key environmental parameters, i.e. once every 3 months.

Assistance with the preparation of documents and implementation of training programs in environmental monitoring and supervision for contractors, CSC and relevant staff of the PPMUs (environmental staff and coordinators of contract packages).

Via PPMUs, discussing with relevant enterprises, as necessary, to find suitable solutions for unexpected risks relating to environmental sanitation.

5.3.3. Reporting Arrangements

The PPMU will prepare reports twice per year for submission to the WB, including a report on compliance with the EMP. The report will contain the monitoring results and assessments by the IEMC that show project progress and the status of implementation of the EMP. The reports will cover, among other matters as appropriate, the following:

- Contractor's compliance with mitigation measures
- Wastewater and environmental sanitation issues
- Existing flooding situation, where relevant
- Traffic congestion or disruption
- Performance of the water supply systems
- Quality of wastewater-receiving water bodies
- Potential project-related risks and risk management issues
- Quality of water in rivers
- Status of measures to assist project-affected people at the new resettlement sites on environmental aspects
- Consultation with local communities in key project areas
5.4. Capacity Building Program

5.4.1. Technical Assistance support for the implementation of safeguards

An assessment of safeguards implementation capacity of existing PPMU staff indicates that PPMU staffs have limited knowledge on WB safeguard requirements as well as limited knowledge of environment and social issues. Such lack of capacity represents a risk to project implementation of safeguards requirements contained in the EMP and, as required by the WB policy, is to be addressed through capacity building. Therefore it is proposed to provide capacity building through technical assistance that will support the PPMU during the implementation of the safeguards requirements. The technical assistance will provide the necessary technical support the PPMU in its work with contractors as well as other entities involved in the implementation of the EMP.

The scope of the technical assistance would cover support from experts and training that would cover both the knowledge on safeguards requirements and procedures for the project as well as training that covers both specific knowledge on safeguard procedures and requirement for the project staff, consultants, and national contractor would be important. This would include, for example, assistance in the preparation of documents and implementation of training program on environmental management and environmental monitoring for contractors, CSC and relevant staffs of PPMU (environmental staffs and coordinators of packages) to do their tasks. It would also include assisting the PPMU’s environmental staffs with the review of contract documents on the bidding packages for construction items of the project to ensure compliance with environmental protection policies and impact mitigation and monitoring requirements as well as provide general environmental guidance as requested by the PPMU to enhance overall project implementation and performance.

Given the nature, locations, and scale of construction, it is anticipated that the safeguard technical assistance support and training will be provided at least during the first 3 years of the project implementation. The WB safeguard specialists will participate in the capacity building in particular in the training activities as appropriate.

5.4.2. Proposed training programs

Table 10 below provides examples of the basic trainings for safeguards during project implementation. The training programs will be developed and delivered by the Technical Assistance team for the implementation of safeguards for the PPMU training. The PPMU/IEMC with the support of the Technical Assistance team for the implementation of safeguards will provide the training to contractors, CSC and other groups.

Other more specific and tailored training will be developed and agreed upon between PMU, IEMC and the Technical Assistance team for the implementation of safeguards during project implementation based upon a reassessment of needs and the status of safeguards implementation.

- Target groups for the training: include PPMU staff, ESU staff, field engineers, CSC, construction contractors, local authorities and community representatives in the project area. Training of workers and drivers is the responsibility of the contractor.
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- Training schedule: At least 1 month before the construction of the first contract. The training can be adjusted in line with the implementation schedule of the subproject/contracts.
- Training frequency: The basic training programs proposed in table 10 will take place every six months on a yearly basis and its content updated and adapted to implementation issues. Training frequency and content will be reassessed during implementation depending on needs. It is foreseen that the training program for PPMU staff will continue until year three of implementation. Three days of training for CSC and contractors are also planned to take place twice a year on an annual basis for at least two years.

Table 10: Training programs for capacity building on environmental supervision and management

<table>
<thead>
<tr>
<th>Target Group</th>
<th>PPMUs (preferably to be organized jointly for all six PPMUs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Environmental supervision, monitoring and reporting</td>
</tr>
<tr>
<td>Participants</td>
<td>Environmental staff and technical staff</td>
</tr>
<tr>
<td>Training Frequency</td>
<td>Soon after project effectiveness but at least 1 month before start of construction of the first contract. Follow-up training will be scheduled as needed.</td>
</tr>
<tr>
<td>Time</td>
<td>Four days of training, to be held twice a year, and then to be repeated on a yearly basis until year three of implementation.</td>
</tr>
<tr>
<td>Content</td>
<td>General environmental management relating to the project, and covering the requirements of WB, DONRE General aspects of environmental supervision; Implementation and supervision of mitigation measures; Community participation in environmental supervision monitoring; Guidance and supervision of contractors, CSCs and community representatives in the implementation of environmental supervision. Use of forms for environmental supervision; Risk response and control; Receipt and submission of reporting forms Other areas of training needs, as determined</td>
</tr>
<tr>
<td>Responsibilities</td>
<td>PPMU, IEMC with support of the Technical Assistance team for the implementation of safeguards.</td>
</tr>
</tbody>
</table>

Target Groups
CSC, CONTRACTORS, COMMUNES/WARDS AUTHORITIES, COMMUNITY REPRESENTATIVES

| Course Title       | Implementation of mitigation measures                       |
| Participators      | CSC; on-site construction management staff; environmental staff of contractors; commune/ward/group authorities. |
| Training frequency | After bidding, and determine based on needs                   |
| Time               | 3 days of training for CSC and contractors and 2 days of training for others, to be repeated twice a year on an annual basis depending on needs |
| Content            | Overview of environmental monitoring; Requirements of environmental monitoring; Role and responsibilities of contractors and CSC Scope and methods of environmental monitoring; Response and risk control; |
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<table>
<thead>
<tr>
<th>Responsibilities</th>
<th>Propagate monitoring forms and guide how to fill in the forms and risk report; Preparation and submission of reports Other areas to be determined.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Groups</td>
<td>COMMUNITIES AND WORKERS</td>
</tr>
<tr>
<td>Course Title</td>
<td>Environmental sanitation and safety</td>
</tr>
<tr>
<td>Participators</td>
<td>Representatives of community and/or worker leaders (as appropriate)</td>
</tr>
<tr>
<td>Training frequency</td>
<td>As appropriate</td>
</tr>
<tr>
<td>Time</td>
<td>One-day presentation and one-day on-the job training twice a year, to be repeated on as needed basis</td>
</tr>
<tr>
<td>Content</td>
<td>Preliminary presentation on environmental protection and environmental overview Key issues that require communities' and workers' attention to minimize safety risks (roads, waterways, equipment, machines, open excavations, etc.) as well as reduce pollution (dust, fumes, gases, oil/grease spills, waste management, etc.) Management of environmental safety and sanitation on work sites; Mitigation measures at construction sites; Safety measures on electricity, mechanical, transportation, air pollution; Procedures to deal with emergency situations; Other areas to be determined.</td>
</tr>
<tr>
<td>Responsibilities</td>
<td>Contractor, PPMU, with support from IEMC</td>
</tr>
</tbody>
</table>

5.5. Estimated EMP Cost

The costs of EMP implementation will comprise (i) cost of implementation of the mitigation measures by the contractors, (ii) costs of supervision by the CSC, (iii) cost for environmental monitoring consultant (IEMC), (iv) costs of monitoring of environmental quality, (v) PPMU safeguard management costs, including technical assistance support for the implementation of safeguards and training. They exclude all resettlement cost and all costs for independent monitoring of the RP and EMDP implementation.

Costs for the implementation of the mitigation measures during construction will be part of the contract costs while the costs for the supervision and monitoring of all construction contractors by the CSC is provided for in the construction supervision contracts. Costs for PPMU operations related to EMP are provided for in the project management budget of the PPMU, including basic safeguards training and allowances for all staff who participate in the monitoring program. After project completion, the cost for environmental monitoring of the constructed facilities will be funded by the cities' operations and maintenance budgets.

The participation of community representatives in EMP implementation is voluntary, and without salary. Hence, to encourage the participation of community members, the cost for materials, equipment used for monitoring and rewards for people who are voted to implement monitoring are taken into account.

The table below shows the sources of funding for the EMP implementation, including the environmental quality monitoring program.

<p>| Table 11: Estimated Costs for EMP implementation During Project Implementation |</p>
<table>
<thead>
<tr>
<th>Source of funds</th>
<th>Cost (SUS)</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>(a) Mitigation during construction</th>
<th>Part of construction contracts under Components 1, 2 and 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) Supervision of safeguards during construction</td>
<td>Part of CSC contracts costs under Component 4</td>
</tr>
<tr>
<td>(c) Environmental Safeguards unit (ESU) of PMU</td>
<td>Part of PPMU operational costs under Component 4</td>
</tr>
<tr>
<td>(d) Environmental quality monitoring</td>
<td>Included in CSC contracts costs</td>
</tr>
<tr>
<td>(e) Independent Environmental Monitoring Consultant (IEMC)</td>
<td>Part of MoC costs</td>
</tr>
<tr>
<td>(f) Safeguards capacity building program</td>
<td>Included in CSC and IEMC consultants' contracts</td>
</tr>
</tbody>
</table>

| | 25,640 |
| | 9,400 |
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ANNEX
Summary of EIA and EMP
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ANNEX 1: Environmental Codes of Practice (ECOPs) for Urban Construction Projects

<table>
<thead>
<tr>
<th>ENVIROMENTAL - SOCIAL ISSUES</th>
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<th>VIETNAM CODE/REGULATION; WORLD BANK ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES</th>
</tr>
</thead>
</table>
| 1. Dust generation          | • The Contractor is responsible for compliance with all relevant Vietnamese laws, regulations and standards with respect to ambient air quality.  
• The Contractor shall ensure that the generation of dust is minimized and does not become a nuisance to local residents. He shall implement a dust control plan to maintain a safe working environment and minimize disturbances to surrounding residential areas/dwellings.  
• The Contractor shall implement dust suppression measures (e.g. use water spraying vehicles to water roads, covering of material stockpiles, etc.) as required.  
• Material loads shall be suitably covered and secured during transport to prevent the scattering of soil, sand, materials, or dust.  
• Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.  
• Dust masks should be used where dust levels are excessive. | • QCVN 05: 2009/BTNMT: National technical regulation on ambient air quality  
• WB Environmental, Health and Safety Guidelines: Air Emissions and Ambient Air Quality; Construction and Decommissioning |

| 2. Air pollution            | • All vehicles must comply with Vietnamese regulations controlling the allowable emission limits of exhaust gases.  
• Vehicles in Vietnam must undergo a regular emissions check and get certified named: “Certificate of conformity from inspection of quality, technical safety and environmental protection” following Decision No. 35/2005/QD-BGTVT;  
• There should be no burning of waste or construction materials, such as bitumen, etc., on site. | • TCVN 6438-2005: Road vehicles Maximum permitted emission limits of exhaust gas.  
• No. 35/2005/QD-BGTVT on inspection of quality, technical safety and environmental protection; |
### Summary of EIA and EMP

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</tr>
</thead>
</table>
| 3. Impacts from noise and vibration | • The contractor is responsible for compliance with the relevant Vietnamese legislation with respect to noise and vibration.  
• All vehicles must have appropriate “Certificate of conformity from inspection of quality, technical safety and environmental protection” following Decision No. 35/2005/QD-BGTVT; to avoid exceeding noise emission from poorly maintained machines.  
• When needed, implement measures to reduce noise to acceptable levels; this should include silencers, mufflers, acoustically dampened panels or placement of noisy machines in acoustically protected areas.  
• Avoid, or at least minimize, heavy vehicle traffic (carrying construction materials) or noisy material processing facilities through or near residential areas.  
• Plan activities in consultation with local communities so that activities that generate high noise levels are done during periods of the day that will result in the least disturbance to the public. | • QCVN 05:2009 BTNMT: National technical regulation on ambient air quality  
• WB Environmental, Health and Safety Guidelines: Air Emissions and Ambient Air Quality; Construction and Decommissioning |
| 4. Water pollution            | • The Contractor is responsible for compliance with the relevant Vietnamese legislation                                                                                                                            | QCVN 26:2010/BTNMT: National technical regulation on noise  
• QCVN 27:2010/BTNMT: National technical regulation on vibration  
• WB Environmental, Health and Safety Guidelines: Noise Management; Construction and Decommissioning |
### 5. Drainage and Wastewater Management

#### ENVIRONMENTAL - SOCIAL ISSUES

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Relevant to wastewater discharges into watercourses.</td>
<td>09:2008/BTNMT: National Technical Standard on underground water Quality</td>
</tr>
<tr>
<td>• Portable or constructed toilets must be provided on site for construction workers.</td>
<td>• QCVN 14:2008/BTNMT: National technical regulation on domestic wastewater;</td>
</tr>
<tr>
<td>• Wastewater from toilets, kitchens, showers, sinks, etc. shall be discharged into a sealed holding tank for removal from the site or for discharge into the municipal sewerage systems, if any; there should be no direct discharges to any water body.</td>
<td>• QCVN 24: 2009/BTNMT: National technical regulation on industrial wastewater;</td>
</tr>
<tr>
<td>• Wastewater that does not meet the standards set by relevant Vietnam technical standards/regulations must be collected in a sealed holding tank and removed from site by licensed waste collectors.</td>
<td>• TCVN 7222: 2002: General requirements on centralized wastewater treatment plant;</td>
</tr>
<tr>
<td>• Using techniques such as berms or flow diversion during construction to limit the exposure of disturbed sediments to moving water</td>
<td>• WB Environmental, Health and Safety Guidelines: Wastewater and Ambient Water Quality; Construction and Decommissioning</td>
</tr>
<tr>
<td>• Make appropriate arrangements for collecting, diverting or intercepting wastewater from households to ensure minimal discharge or local clogging and flooding.</td>
<td></td>
</tr>
<tr>
<td>• Before the start of construction, obtain all necessary wastewater disposal permits/licenses and/or finalize all necessary wastewater disposal contracts.</td>
<td></td>
</tr>
<tr>
<td>• At completion of construction works, wastewater collection tanks and septic tanks shall be safely disposed or effectively sealed off.</td>
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</table>

The Contractor shall follow the detailed drainage designs included in the construction.
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| sedimentation control         | plans, intended to prevent storm water from causing local flooding or scouring slopes and areas of unprotected soil, resulting in heavy sediment loads affecting local watercourses.  
• Ensure drainage system is always well maintained and cleared of mud and other obstructions.  
• Areas of the site not disturbed by construction activities shall be maintained in their existing conditions.  
• Earthworks, cuts, and fill slopes shall be properly maintained, in accordance with the construction specifications, including measures such as installation of drains, and use of plant cover.  
• To avoid sediment-laden runoff that could adversely impact watercourses, install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is established. Sediment control structures could include windrows of logging slash, berms, sediment catchment basins, straw bales, storm drain inlet protection systems, or brush fences.  
• Site de-watering and water diversions: Where construction activities require that work be carried out within the watercourse (e.g. culvert or bridge crossing construction, retaining wall construction, erosion protection works), the work area must be dewatered to facilitate work in dry conditions. The sediment-laden water pumped from the work area must be discharged to an appropriate sediment control structure for treatment before release to the stream.  
• Stream diversions or construction of cofferdams would require site-specific mitigation measures in the EMP. | Earth works-Codes for construction  
• Decree No. 22/2010/TT-BXD on regulation of construction safety  
• QCVN 08:2008/BTNMT – National technical regulation on quality of surface water  
• World Bank Environmental, Health and Safety Guidelines: Construction and Decommissioning; Wastewater and Ambient Water Quality |

6. Management of stockpiles, quarries, and borrow pits  
• All locations to be used must have been previously identified in the approved construction work plan. Sensitive sites such as scenic spots, areas of natural habitat, areas near sensitive receptors, or areas near water should be avoided.  
• Build an open ditch around the stockpile site to intercept the runoff.  
• Stockpile topsoil when first opening a borrow pit and use it later to restore the area to | World Bank Environmental, Health and Safety Guidelines: Waste Management; Hazardous Materials |

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<tbody>
<tr>
<td></td>
<td>near natural conditions.</td>
<td>Management; Occupational Health and Safety; Construction and Decommissioning</td>
</tr>
<tr>
<td></td>
<td>• If the need for new stockpile or disposal sites arises during construction, they must be pre-approved by the Construction Supervision Engineer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If any landowners are affected by use of their land for stockpiles or borrow pits, they must be included in the project resettlement plan.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If access roads are needed, they must have been considered in the environmental assessment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Quarries and large material borrow pits or material stockpiles may need site-specific measures.</td>
<td></td>
</tr>
<tr>
<td>7. Solid waste</td>
<td>• Before the start of construction, prepare a solid waste management plan for storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.; it must be carefully followed monitored during construction.</td>
<td>• Decree No. 59/2007/ND-CP on solid waste management</td>
</tr>
<tr>
<td></td>
<td>• Before the start of construction, obtain all necessary waste disposal permits or licenses.</td>
<td>• World Bank Environmental, Health and Safety Guidelines: Waste Management; Hazardous Materials Management; Construction and Decommissioning</td>
</tr>
<tr>
<td></td>
<td>• Take all necessary measures to reduce the potential for litter and negligent behavior with regard to the disposal of refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Solid waste may be temporarily stored on site in a designated area approved by the Construction Supervision Consultant and relevant local authorities prior to collection and disposal through a licensed waste collector.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cover all waste storage containers, to be tipping-proof, weatherproof and scavenger-proof.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No burning, on-site burying or dumping of solid waste shall occur.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc. shall be collected and separated on-site from other waste sources for reuse, for use as fill, or for sale.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If not removed off site, solid waste or construction debris shall be disposed of only at sites identified and approved by the Construction Supervision Consultant and included in the solid waste plan. Under no circumstances shall the contractor dispose of any waste</td>
<td></td>
</tr>
</tbody>
</table>

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</tr>
</thead>
</table>
| 8. Chemical or hazardous wastes | • Chemical waste of any kind shall be disposed of at an approved appropriate sanitary landfill site and in accordance with local legislative requirements. The Contractor shall obtain needed disposal certificates.  
• The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained and certified workers.  
• Used oil and grease shall be removed from site and sold to an approved used oil recycling company.  
• Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and removed from site by a specialized oil recycling company for disposal at an approved hazardous waste site.  
• Used oil or oil-contaminated materials that could potentially contain PCBs shall be securely stored to avoid any leakage or affecting workers. The local DONRE must be contacted for further guidance.  
• Unused or rejected tar or bituminous products shall be returned to the supplier's production plant.  
• Relevant agencies shall be promptly informed of any accidental spill or incident.  
• Store hazardous chemicals appropriately and with appropriate labeling, and in locked containers.  
• Appropriate communication and training programs should be put in place to prepare workers to recognize and respond to workplace chemical hazards.  
Prepare and initiate a remedial action following any spill or incident. In this case, the contractor shall provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions. | • Decision No. 23/2006/QD-BTNMT with list of hazardous substance  
• Circular No. 12/2011/TT-BTNMT on management of hazardous substance  
• World Bank Environmental, Health and Safety Guidelines: Waste Management; Hazardous Materials Management; Construction and Decommissioning |
<p>| 9. Management of dredged materials | • Dredging plan should be established including time schedule, method statement to meet the requirements of traffic safety, public health, and environmental sanitation. In order to ensure dredging that is consistent with environmental regulations, key decision makers | • Decision No. 23/2006/QD-BTNMT with list of hazardous substance |</p>
<table>
<thead>
<tr>
<th>ENVIRONMENTAL - SOCIAL ISSUES</th>
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<th>VIETNAM CODE/REGULATION; WORLD BANK ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES</th>
</tr>
</thead>
</table>
| 10. Disruption of vegetative cover and ecological resources | The Contractor shall prepare a Clearance, Re-vegetation and Restoration Management Plan for prior approval by the Construction Supervision Engineer, following relevant regulations. This plan shall be approved by the Construction Supervision Consultant and followed strictly by contractor. Areas to be cleared should be minimized as much as possible.  
The Contractor shall remove topsoil from all areas where topsoil will be impacted by | substance  
• Decree No. 59/2007/ND-CP on solid waste management  
• Circular No. 12/2011/TT-BTNMT on management of hazardous substance  
• World Bank Environmental, Health and Safety Guidelines: Waste Management; Hazardous Materials Management; Contaminated Land; Community Health and Safety; Construction and Decommissioning |
Summary of EIA and EMP
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<tr>
<td>construction activities, including temporary activities such as storage and stockpiling, etc; the stripped topsoil shall be stockpiled in areas agreed with the Construction Supervision Consultant for later use in re-vegetation; it shall be adequately protected while it is stored.</td>
</tr>
<tr>
<td>• The application of chemicals for vegetation clearing is not permitted.</td>
</tr>
<tr>
<td>• Prohibit cutting of any tree unless explicitly authorized in above-referred plan.</td>
</tr>
<tr>
<td>• When needed, erect temporary protective fencing to effectively protect all trees before commencement of any works within the site.</td>
</tr>
<tr>
<td>• No area of potential importance as an ecological resource should be disturbed unless there is prior authorization from CSC, who should consult with PMUs, IEMC and the relevant local authorities. This could include breeding or feeding areas of birds or animals, fish spawning areas, or any other area that is protected as a green space.</td>
</tr>
<tr>
<td>• The Contractor shall ensure that no hunting, trapping shooting, poisoning of animals takes place on the construction site or by the workers.</td>
</tr>
</tbody>
</table>

11. Traffic management

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<th>MITIGATION MEASURE</th>
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<tr>
<td>• Before construction, carry out consultations with the affected local government and communities and with the traffic police.</td>
</tr>
<tr>
<td>• Cover any significant increases in number of vehicle trips must in a construction plan. For routing of construction traffic, especially of heavy vehicles, take into account sensitive sites such as schools, hospitals, temples, churches and markets.</td>
</tr>
<tr>
<td>• Install lighting at night, if necessary, to ensure safe traffic circulation.</td>
</tr>
<tr>
<td>• Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety warning signs.</td>
</tr>
<tr>
<td>• Use safe traffic control measures, including road/rivers/canal signs and flag persons to warn of dangerous conditions.</td>
</tr>
<tr>
<td>• Avoid the transport of construction materials during rush hours.</td>
</tr>
<tr>
<td>• Provide separate passageways for pedestrians and vehicles within and outside construction areas to allow easy, safe, and appropriate access. Signs shall be installed appropriately in both water-ways and roads where necessary.</td>
</tr>
</tbody>
</table>

VIETNAM CODE/REGULATION; WORLD BANK ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES

• Law on traffic and transportation No. 23/2008/QH12
• Law on construction No. 16/2003/QH11
• Decree No. 22/2010/TT-BXD on regulation of construction safety
• World Bank Environmental, Health and Safety Guidelines: Community Health and Safety

PMU of Tra Vinh City Subproject
Consultant: Pacific Technology JS. Co. (PCO)
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<tbody>
<tr>
<td><strong>12. Interruption of utility services</strong></td>
<td>Decree No. 73/2010/ND-CP on administrative penalization security and society issues</td>
</tr>
</tbody>
</table>
| • With regard to planned and unplanned interruptions to water, gas, electric power, and 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 work schedules as well as planned disruptions at least 5 days in advance.  
• Avoid interruptions of irrigation water supply to agricultural areas.  
• Ensure alternative water supply to affected residents in the event of disruptions lasting more than one day.  
• Report any damages to existing utility systems of cable to authorities concerned; make sure they are repaired as soon as possible.                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                               |
| **13. Restoration of affected areas**                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Law on Environment protection No. 52/2005/QH11  
• World Bank Environmental, Health and Safety Guidelines: Construction and Decommissioning                                                                                                                                                                                                                                                                                                                                                     |
### ENVIROMENTAL - SOCIAL ISSUES

<table>
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</thead>
<tbody>
<tr>
<td>• Comply with all Vietnamese regulations regarding workers' and public safety.</td>
<td>• Decree No. 22/2010/TT-BXD on regulation of construction safety</td>
</tr>
<tr>
<td>• Prepare and implement action plan to cope with risks and emergencies</td>
<td>• Instruction No. 02/2008/CT-BXD on safety and sanitation issues in construction agencies</td>
</tr>
<tr>
<td>• Have emergency first aid equipment available at construction sites.</td>
<td>• TCVN 5308-91: Technical regulation on safety in construction</td>
</tr>
<tr>
<td>• Train workers in occupational health and safety regulations.</td>
<td>• Decision No. 96/2008/QD-TTg on clearance of UXO.</td>
</tr>
<tr>
<td>• Ensure that workers wear / use appropriate personal protective equipment (PPE), such as safety glasses, face shields, hard hats, safety shoes, etc.</td>
<td>• World Bank Environmental, Health and Safety Guidelines: Occupational Health and Safety; Community Health and Safety; Construction and Decommissioning</td>
</tr>
<tr>
<td>• Ensure that ear pieces (noise protection ear muffs) are provided to and used by workers who use noisy machines such as piling hammers, for workers' protection.</td>
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<tr>
<td>• During demolition of existing infrastructure, workers and the general public must be protected from falling debris by measures such as warning signs, chutes, traffic control, barriers and restricting access.</td>
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<tr>
<td>• Install fences, barriers, warning/prohibition signs around construction sites with potential dangers to the public.</td>
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<tr>
<td>• Provide safety measures through installation of fences, barriers warning signs, lighting system against traffic accidents as well as other risks to the public.</td>
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<tr>
<td>• Remove hazardous conditions on construction sites that cannot be controlled effectively with access restrictions, such as covering small openings and ensuring means of escape from larger openings, such as trenches or open excavations.</td>
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<tr>
<td>• Ensure visibility of workers through their use of high visibility vests when working in heavy equipment operating areas.</td>
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<td>• Ensure that moving equipment is fitted with audible back-up alarms.</td>
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<tr>
<td>• When work is done in confined spaces, such as deep excavation (trenches) use dewatering, adequate side-wall supports (shoring) and slope gradients that minimize the risks of collapse, entrapment or drowning.</td>
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<tr>
<td>• Provide safe means of access and exit from excavations through graded access, or stairs and ladders.</td>
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<tr>
<td>• Train and use temporary fall prevention devices, such as rails or other barriers when working at heights greater then 2 meters.</td>
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<td>ENVIRONMENTAL – SOCIAL ISSUES</td>
<td>MITIGATION MEASURE</td>
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<td>• Conduct sawing, cutting, grinding, sanding, chipping or chiseling with proper anchoring and guards, i.e. safety glasses</td>
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<td></td>
<td>• Implement good housekeeping practices on site, such as sorting and placing loose construction materials and debris in established areas away from footpaths.</td>
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<td>• Locate electrical cords and ropes in common areas and marked corridors.</td>
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<td>• Clean up excessive waste, debris and liquid spills regularly.</td>
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<td></td>
<td>• If explosives and blasting will be used, evacuate work areas during blasting, use blast mats or other means to minimize flying rock if work is conducted in proximity to people and structures. Use warning signs and standard procedures to secure site. Additional mitigation measures and safety precautions may be required.</td>
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<td></td>
<td>• If previous assessments indicate there could be unexploded ordinance (UXO), clearance must be done by qualified personnel and as per detailed plans approved by the Construction Engineer.</td>
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</table>

15. Communication with local communities

- Maintain open communications with the local government and concerned communities; the contractor shall coordinate with local authorities (leaders of local wards or communes, leaders of villages) the agreed schedules of construction activities at areas nearby sensitive places or at sensitive times (e.g., religious festival days).
- Copies in Vietnamese of these ECOPs and of other relevant environmental safeguard documents shall be made available to local communities and to workers at the site.
- Reduced playground space, loss of playing fields and car parking: The loss of amenities during the construction process is often an unavoidable source of inconvenience to users in sensitive areas. However, early consultation with those affected, provides an opportunity to investigate and implement alternatives.
- Disseminate project information to affected parties (for example local authority, enterprises and affected households, etc.) through community meetings before construction starts;
- Provide a community relations contact from whom interested parties can receive information on site activities, project status and project implementation results;

• Decree No. 73/2010/ND-CP on administrative penalization security and society issues
• World Bank Environmental, Health and Safety Guidelines: Community Health and Safety; Construction and Decommissioning
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</table>
| 16. Chance find procedures                  | • Provide all information, especially technical findings, in a language that is understandable to the general public and in a form that is useful to interested citizens and elected officials through the preparation of fact sheets and news releases, 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 bus routes, blasting and demolition, as appropriate;  
• Provide technical documents and drawings to affected communities, especially a sketch of the construction area and a copy of the EMP for the construction site;  
• Notification boards shall be erected at all construction sites providing information about the project, as well as the contact information of the site managers, environmental staff, and health and safety staff. Telephone numbers and other contact information must be provided so that any affected people have the channel to voice their concerns and suggestions. | • Law on Cultural Heritage (2002)  
• Law on Cultural Heritage (2009) for supplementary and reformation  
• Decree No. 98/2010/ND-CP for supplementary and reformation |

If the Contractor discovers archaeological 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 the responsible local or national authorities in charge of the cultural property in Viet Nam (within 24 hours or less);  
• Relevant local or national authorities, once they have been notified, will be responsible for protecting and preserving the site before deciding on subsequent appropriate actions.
### Summary of EIA and EMP

**Mekong Delta region Urban Upgrading Project (MDR - UUP) - Tra Vinh city Sub-project**

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<td>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, such as aesthetic, historic, scientific or research, social and economic values;</td>
</tr>
<tr>
<td></td>
<td>• Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout of the work (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;</td>
</tr>
<tr>
<td></td>
<td>• 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;</td>
</tr>
<tr>
<td></td>
<td>• Decisions concerning the management of the finding shall be communicated in writing by relevant authorities;</td>
</tr>
<tr>
<td></td>
<td>• Construction works could resume only after permission is granted from the responsible local authorities concerning safeguard of the heritage.</td>
</tr>
</tbody>
</table>

**VIETNAM CODE/REGULATION; WORLD BANK ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES**
ANNEX 2: Guidelines for the Preparation of a Dredged Materials Management Plan (DMMP) for Contaminated Sludge

To ensure that dredging, transportation, and disposal of contaminated sludge will not create adverse impacts on local residents and the environment, a guideline for the preparation of a DMMP is provided below. If during the environmental assessment stage, contaminated material is identified in the water body to be excavated, the detailed design will include a comprehensive testing program and the development of a DMMP, reflecting the guidelines below. The detailed DMMP shall be prepared by the contractor in consultation with the PMU and the World Bank prior to commencement of civil works.

The main environmental and social issues related to contaminated dredged materials are: (a) pollution during the transport of the dredged materials from the dredging site to the disposal area; (b) potential increase in turbidity and pollution of the ambient water in the lakes/canals during dredging; (c) odors and other nuisance to local residents; and (d) potential improper use of contaminated sludge for public infrastructure works or in residential areas. To facilitate the preparation of a DMMP given that the activities will be carried out in an urban area and/or in an existing water body that may be used by other water users, the following important aspects must be considered:

- **Assess the quality of the sediments.** This assessment must be carried out to confirm that the sediments do not include large amounts of environmentally harmful materials, such as heavy metals and/or other toxic substances. If the materials are found to be above the thresholds for heavy metals or toxic substances stipulated by the national standards, a special disposal plan should be prepared, together with a monitoring plan. The special disposal plan should also include a program to protect the residents in nearby communities from using the dredged materials for house construction or gardening. The bottom sediment/sludge samples will be analysed for key pollutants according to the Vietnamese national standards. The sampling and analytical methods should be in line with the GoV regulations while the number of sampling locations will depend on the risk levels for each specific site. The number of samples to be analysed will be determined by the proposed volume of dredging as follows:

<table>
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<tr>
<th>Volume of Dredged Material in m³</th>
<th>No. of Sediment Samples</th>
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<tbody>
<tr>
<td>Up to 25,000</td>
<td>3</td>
</tr>
<tr>
<td>25,000 to 100,000</td>
<td>4-6</td>
</tr>
<tr>
<td>100,000 to 500,000</td>
<td>6-10</td>
</tr>
<tr>
<td>500,000 to 2,000,000</td>
<td>10-20</td>
</tr>
<tr>
<td>For each 1,000,000 above 2,000,000</td>
<td>Additional 10</td>
</tr>
</tbody>
</table>
Identify the land available for the disposal of the dredged materials. The DMMP should identify the landfill sites and/or land that would be suitable for the disposal of dredged materials in line with the level of risks associated with it. Public land, land for construction of rural roads or other public works, or private land, may be used, if the affected landowners agree. If the risks due to contamination of the sludge are high, the sludge must be disposed of at sanitary landfills.

Prepare a dredging and transport plan. The dredging procedures and transport plan will outline the following: (a) dredging methods (pipeline, water pumping before digging, etc.), mode of transport to the disposal areas and/or temporary storage sites. If trucks are used, indicate proposed transport routes from the dredging site to the disposal area, (b) time and hours of operation, (c) types of barges or vehicles/trucks and proposed measures to reduce the leakage of the dredged materials from the transport trucks, (d) contractors' responsibilities for cleaning the roads and carry out remedial works if necessary, and (e) a communication plan for the nearby communities, including contact numbers for lodging complaints.

Temporary storage/disposal for uncontaminated sediment/mud. The dredged materials are in a mud-like state before settling for 24 – 48 hours. All drainage water from the temporary storage on land shall be discharged back to the canal/lakes. For highly contaminated sludge, or sludge containing organic materials that generate strong odors, the dredged materials should be hauled by closed tanker trucks away from the construction site as soon as possible. For bottom sediments with a low content of organic materials, the dredged sediments will be transported to a containment area which is appropriately located and properly designed and of an adequate size. A monitoring plan for tracking the disposal of highly contaminated materials, if any are present, will also be prepared.

Identify key areas and/or facilities (businesses, schools, public services, etc.) that are sensitive to dredging and transport of dredged materials. The DMMP shall include an inventory / analysis of the potentially affected local businesses, access to water, and transport due to the dredging operations, and provide a plan to mitigate and/or compensate for the disturbances. The plan should include all measures necessary to avoid impacts on local transportation and water supply, and access to local residents as much as possible.

Identify other water users. In areas where dredging may cause negative impacts to these water users, the respective subproject owner is required to inform/consult them and develop a series of actions to address their concerns, including water quality monitoring in the DMMP.
“Về kết quả công bố thông tin báo cáo
EIA/EMP, RP và EMDP – Dự án
Nâng cấp đô thị vùng đồng bằng sông
Cửu Long – Tiểu dự án thành phố Trà
Vinh, tỉnh Trà Vinh”

Kính gửi: BQL dự án Phát triển đô thị - Bộ Xây dựng

Theo yêu cầu của Ngân hàng Thế giới và Bộ Xây dựng về việc công bố thông tin báo cáo đánh giá tác động môi trường, kế hoạch quản lý môi trường (EIA/EMP), báo cáo kế hoạch Tài chính dự (RP) và báo cáo kế hoạch phát triển dân tộc thiểu số (EMDP) trước khi thẩm định chính thức dự án Nâng cấp đô thị vùng đồng bằng sông Cửu Long,

Sau khi được chuyển giao toàn bộ hồ sơ với môi trường của Ngân hàng Thế giới xem xét và góp ý và thông nhất các nội dung báo cáo, UBND thành phố Trà Vinh đã chỉ đạo UBND các phường trong vùng dự án kết hợp BQL dự án Nâng cấp đô thị thành phố Trà Vinh triển khai thực hiện công tác công bố thông tin đến người dân trong vùng dự án, với những nội dung sau:

- Công bố thông tin về Báo cáo tổng tải đánh giá tác động môi trường (EIA) và Kế hoạch quản lý môi trường (EMP); Kế hoạch tài chính dự (RP) và Kế hoạch Phát triển Dân tộc thiểu số (EMDP) của dự án đến tất cả các khu vực dân cư trong toàn phường (Bao gồm cả người hưởng lợi và người bị ảnh hưởng).

- Hình thực tổ chức công bố thông tin: Họp Ban chấp hành Đảng uỷ, thông báo thông tin đến toàn thể đảng viên; các Ban ngành, đoàn thể và công đồng dân cư khác; niêm yết tại các trụ sở UBND các phường, Ban nhân dân khóm trong vùng dự án và thông báo rộng rãi trên hệ thống truyền thanh phương.

- Những thông tin phản hồi của cán bộ và nhân dân địa phương đã được UBND phường giải thích hoặc ghi nhận đầy đủ và gửi về cơ quan cải tiến thực hiện dự án của UBND thành phố là BQL dự án Nâng cấp đô thị thành phố Trà Vinh (địa chỉ: số 550, đường Phan Đình Phùng, khóm 3, phường 6, thành phố Trà Vinh).
- Các hoạt động công bố thông tin đại chúng tại các phường (trong danh sách đính kèm) đã được triển khai bắt đầu từ ngày 29/12/2011. Kính đề nghị BQL dự án Phát triển đô thị xem xét đề xuất Ngân hàng Thế giới hỗ trợ công khai thông tin bản tiếng Anh các báo cáo trên Trung tâm thông tin (Infoshop) và trang Web của Ngân hàng Thế giới./

Nơi nhận:
- Như kq/g;
- CT, PCT (khối đô thị);
- BQLDA NCDT;
- UBND các phường 1, 2, 4, 5, 6, 7, 8, 9;
- BLDVP, c/l Đại;
- Lưu (13b).

KT. CHỦ TỊCH
PHÓ CHỦ TỊCH

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