

Environmental Management Plan

July 2012

VIE: Greater Mekong Subregion Corridor Towns Development Project

Moc Bai Subproject, Viet Nam

Prepared by the Provincial People's Committee of Quang Tri and Tay Ninh for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 31 July 2012)

Currency unit	–	dong (D)
D1.00	=	\$ 0.0000479
\$1.00	=	D20,845

ABBREVIATIONS

ADB	–	Asian Development Bank
AH	–	affected household
BOD	–	biological oxygen demand
COD	–	chemical oxygen demand
CTDP	–	Corridor Towns Development Project
DoC	–	Department of Construction
DoF	–	Department of Finance
DoH	–	Department of Health
DoNRE	–	Department of Environment and Natural Resources
DoT	–	Department of Transport
DPI	–	Department of Planning and Investment
EA	–	environmental assessment
ECC	–	environmental compliance certificate
ECO	–	environmental control officer
EIA	–	environment impact assessment
EMP	–	environment management plan
EMU	–	Environmental Management Unit
EERT	–	external emergency response team
ERT	–	emergency response team
ERTL	–	emergency response team leader
ESO	–	environmental site officer
FGD	–	focus group discussion
GMS	–	Greater Mekong Subregion
GoV	–	Government of Viet Nam
IA	–	implementing agency
IEE	–	initial environmental examination
LAR	–	land and resettlement
NGOs	–	nongovernment organization
O&M	–	operation and maintenance
PIU	–	project implementation unit
PMU	–	project management unit
UXO	–	unexploded ordnance

WEIGHTS AND MEASURES

km	–	kilometer
kg	–	kilogram
ha	–	hectare
M	–	millimeter

NOTE

In this report, "\$" refers to US dollars.

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I. INTRODUCTION

1. The environmental management plan (EMP) provided herein for the Moc Bai subproject of the Corridor Towns Development Project (CTDEP) has been upgraded to meet the requirements of the ADB (SPS 2009). The stand-alone EMP was prepared for the four infrastructure investments of the Moc Bai subproject. The EMP for Moc Bai is one of three EMPs that have been prepared for the three subprojects of Dong Ha & Lao Bao in Quang Tri province, and Moc Bai in Tay Ninh province which form the CDTP in Viet Nam. The parent Initial Environmental Evaluation (IEE) of the three subprojects of Viet Nam is found under separate cover.

A. Subproject Investments

The component investments of the Moc Bai subproject are summarized in Table 1.

Table 1. Infrastructure Investments of Moc Bai Subproject

Subproject Investment
1) Water Supply development – New WTP <ul style="list-style-type: none">• WTP (7000 m³/d)• Treated pump stations• 45 km distribution network (100-500dia)
2) Wastewater Treatment – New WWTP <ul style="list-style-type: none">• Sewer drainages• Eight pump stations• WWTP (9000 m³/d)
3) Upgraded urban road network an drainage <ul style="list-style-type: none">• Road widening, improved surfacing• Lighting, treed median• Upgraded later and surface drainage
4) Materials recovery facility <ul style="list-style-type: none">• Safer and more efficient sorting facility and technology

II. INSTITUTIONAL ARRANGEMENTS & RESPONSIBILITIES

2. At the feasibility stage the primary management framework overseeing the implementation of the environmental management plan (EMP) for Moc Bai subproject will be defined by the: 1) Tay Ninh Provincial Peoples Committee (PPC) who is the executing agency (EA) of the subproject; 2) the City Peoples Committee (CPC) of Moc Bai who will be the implementing agency (IA); 3) a project management unit (PMU) nominated by the Department

of Planning & Investment (DPI) who will assist the IA with the overall implementation of the subproject investments including directing the construction contractors; and 4) project implementation units (PIU) to assist the PMU with implementation of the individual subproject investments.

3. A Project Steering Committee (PSC) will be created to provide policy and technical guidance for subproject implementation. The PSC will be chaired by the EA, and will be comprised of line departments such as Construction (DoC), Transport (DoT), Finance (DoF), and Environmental Management (DoNRE), as well as the Moc Bai CPC. The Department of Environment and Natural Resources (DoNRE) is the regulatory authority for all environmental matters of the subproject.

4. An environmental management unit (EMU) will be identified in the PMU. The EMU will work with the construction contractors to ensure that the EMP is implemented for all subproject investments. Each construction package should include an environmental control officer (ECO) who works with the EMU to ensure the impact mitigations of the EMP are implemented.

5. A Detailed Design and Supervision Consultant¹ (DDSC) will assist with the detailed designs of the subproject. The DDSC will include an environmental specialist who will work with EMU/PMU to update the EMP to ensure EMP meets the final subproject designs. The environmental specialist will assist the EMU at the beginning and periodically throughout the implementation of the subproject investments. The ADB is responsible for monitoring to ensure subproject meets the environmental safeguards of the SPS (2009).

6. The responsibilities of the EA are summarized below:

1. Overall responsibility for subproject implementation and establishment of the subproject Management Unit (PMU);
2. Sign the subproject Agreement on behalf of the National Government;
3. Approve medium term and annual rolling plans for subproject implementation;
4. Ensure compliance of Loan Covenants;
5. Ensure Government counterpart fund allocation;
6. Establish and manage first generation impress accounts;
7. Submit disbursement projections and withdrawal applications to ADB;
8. Submit audited subproject accounts and audited financial statements to ADB;
9. Approve procurement plans, bidding documents, bid evaluation and contract awards;
10. Submit regular quarterly and annual subproject reports to ADB;
11. Submit updated resettlement plans for ADB concurrence prior to implementation;
12. Ensure compliance of subproject implementation with ADB's social and environmental policies and guidelines;
13. Approve proposed actions in the event of adverse financial audits or monitoring and evaluation reports; and
14. Select Consultant for subproject Implementation Support and Capacity Development.

The EA will hold overall accountability of the subproject implementation and operation on behalf of the GoV and will work as national subproject agency.

7. The responsibilities of the IA are summarized below:

¹ International DDSC to be defined.

1. Coordinate and monitor subproject implementation activities of PMU;
2. Support PMU in carrying out the approved annual rolling plans;
3. Coordinate capacity development program for PMU,
4. Obtain necessary approvals from respective departments prior to awarding of civil works contracts,
5. Support EMU/PMU in the implementation of EMP,
6. Coordinate regular reporting of PMU to EA on EMP implementation,
7. Undertake regular quality control inspection of subproject facilities,
8. Manage the handover of subproject facilities to agencies responsible for operation and maintenance.

8. The PMU will oversee and coordinate the implementation of the subproject investments including the management of the institutional strengthening plan. It will also be responsible for coordinating subproject implementation with the participating agencies and institutions at the district and corridor town levels to ensure broad participation in subproject related activities and further enhance subproject ownership.

9. Responsibilities of the PMU/PIU are summarized below:

1. Undertake day to day management of subproject activities;
2. Implement approved annual rolling work and financial plans;
3. Prepare and submit regular quarterly and annual subproject reports;
4. Establish and manage second generation impress accounts;
5. Undertake procurement of civil works and equipment;
6. Supervise civil works contractors;
7. Manage separate subproject financial records and account, and prepare financial reports for submission to EA and IA;
8. Prepare withdrawal application for submission to EA;
9. Ensure that EMPs are incorporated in the detailed designs and included in civil works contracts;
10. Ensure EMP implementation; submit regular monitoring reports to IA and EA; and
11. Monitor implementation of resettlement activities by the respective corridor towns and submit monitoring reports to IA and EA

10. The PMU/PIU/EMU and ECO with assistance from the DDSC will ensure that the EMP becomes part of the construction contract, that the EMP is implemented, and that the contractor(s) abide by the EMP. The ECO should undertake regular site inspections and the results should be recorded and submitted to the relevant authorities as part of progress reporting.

III. SUMMARY OF POTENTIAL IMPACTS

11. The potential impacts of the infrastructure investments defined by: 1) water supply development & new WTP; 2) wastewater treatment improvements & new WWTP; 3) urban road upgrades; and 4) establishment of a MRF in Moc Bai are summarized below (Table 2). The potential impacts were identified by the consolidated IEE. The IEE indicates that potential impacts of the infrastructure developments are primarily construction-related and can be mitigated.

A. Water Supply Development

12. The potential impacts are disturbances to local community in Moc Bai arising from civil construction activities. During the operation of completed water supply system and WTP the potential environmental issues are: 1) the sustainability of the required quality and quantity of raw groundwater source; 2) the resultant sustainability of treated water quality; 3) disposal of treatment sludge; 4) the ability of future wastewater management of the community to accommodate the increased wastewater that will be produced by the water supply system; and 5) risk of spills of hazardous chemicals such as chlorine.

13. The issues need to be reviewed at detailed design phase to ensure the overall sustainability of the WTP according to specifications. Of particular importance is sustainability of raw groundwater supply, and the capacity of future wastewater treatment in Moc Bai for an increase in wastewater.

B. Wastewater Treatment Improvements

14. During construction phase the excavation work that may be required for the receiving, settling, oxidation or sludge tanks of Option 1 of the WWTP need to consider the sensitivity of local groundwater. A review of the depth of the water table, soil permeability, and subsurface flow of local aquifer should be conducted during the pre-construction phase.

15. The detailed designs of the WWTP and raw sewage pipelines need to confirm whether local groundwater, and land & surface waters are vulnerable to possible leakage or rupture from the various treatment tanks or pipelines. The effects of possible leaks from the planned pressurized stages of raw sewage transport should be assessed.

16. During the operation of the new WWTP the potential exists for the receiving canals and the Vam Co Dong river to become polluted from the treated effluent from the WWTP. This would arise if: 1) the actual effluent quality does not meet the proposed standard (GoV (7957-2008) Category B) due to a treatment process problem at WWTP, or the drainage canals and Vam Co Dong river cannot assimilate (e.g., dilute quickly) the treated effluent.

17. Other potential environmental impacts of the operation of the WWTP concern negative aesthetic values of WWTP to local community (e.g. noise, odour, traffic).

C. Urban Road & Drainage Upgrades

18. The potential impacts of the upgrades to the urban roads and drainage in Moc Bai are construction-related disturbances to adjacent households and businesses such as noise, dust, solid & liquid waste, construction traffic, and reduced community and commercial access. Potential operational impacts of the upgraded roads are increased traffic congestion & accidents, and air pollution.

D. Materials Recovery Facility

19. The impacts of the MRF are primarily construction-related. The operation of the new MRF could potentially cause increased traffic congestion and accidents from the anticipated increase in truck traffic to the MRF.

Table 2. Summary of Potential Environmental Impacts of Moc Bai Subproject

Pre-construction Phase	
1) Land acquisition and resettlement to be addressed by RAP. 2) Land clearing.	
Construction Phase	
1) Environmental impacts of civil works (e.g., dust, air pollution, solid & liquid waste, erosion, local flooding, pollution of land, and sedimentation and pollution surface waters including Vam Co Dong river). 2) Potential unforeseen impacts on valued ecological habitat, and cultural property & values after component site locations finalized at detailed designs. Pollution, loss of aquatic habitat of surface waters including Vam Co Dong river. 3) Civil disturbance (e.g., noise, vibration, increased traffic, reduced access, disrupted business & community activity, social issues from migrant workers, worker & public accidents). Impaired use of roads to be upgraded, and disturbance to adjacent households, businesses, and public places.	
Operation Phase	
Water supply development:	1) Unsustainable quantity & quality of groundwater supply, un-sustained treated potable water supply, insufficient capacity to manage increased wastewater production by community, and potential pollution from spills of hazardous materials such as chlorine, and from waste treatment sludge
Wastewater treatment:	2) Contamination of groundwater, land and surface waters, inability of Vam Co Dong river to assimilate the treated effluent, and the WWTP generating negative aesthetic effects on local community.
Upgraded urban roads:	3) Increased traffic leading to increased traffic congestion, accidents, and air pollution.
MRF:	4) Increased traffic leading to increased traffic congestion, accidents, and air pollution

E. Public Consultation

20. The stakeholder consultations that were implemented for the IEE will be continued with the start of the pre-construction phase of the subproject. The first step will be the disclosure of the IEE to the affected stakeholders identified in the IEE for their review and comment.

1. Follow-up Consultation

21. As indicated in the IEE, no negative issues of the subproject investments were raised by consulted stakeholders in Moc Bai. However, the status of stakeholder views of the subproject will be updated with the continuation of stakeholder consultations during the pre-construction design phase of the subproject.

IV. MITIGATION PLAN

22. The mitigation measures of the EMP are presented in a comprehensive mitigation plan for the subproject which is summarized in Table 3. The plan includes the environmental issues and concerns raised at the stakeholder meetings. The plan identifies responsible parties, location, and timing. Marginal costs for implementing mitigation measures zero because the costs for mitigations are to be included in contractor bid documents.

23. The mitigation plan combines the construction phase activities common to all investments in Moc Bai while highlighting activities and mitigations specific to a single infrastructure investment.

Table 3. Environmental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Responsibility	
						Supervision	Implementation
Pre-Construction, Detailed Design Phase							
Confirmation of required resettlement, temporary relocations, & compensation	No negative environmental impacts	1. Affected persons well informed well ahead of subproject implementation.	All affected persons in subproject component areas	Before project implemented	See resettlement plans	IA/PMU	Resettlement committees
Disclosure, & engagement of community	No community impacts	2. Initiate Information Disclosure and Grievance process of IEE	For all construction sites.	Beginning of project	Quarterly	IA/PMU	IA
GoV approvals	No negative impact	3. Notify DoNRE of subproject initiation to complete GoV EA requirements, and obtain required project permits and certificates.	Entire subproject	Before construction	As required	DoNRE	DoNRE

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Detailed designs of subproject,	Minimize negative environmental impacts	<p>4. Work with DDSC² to complete detailed designs of the: 1) Water Supply System; 2) Wastewater treatment system; 3) upgraded road & drainage; and 4) MRF. Ensure the following measures are addressed:</p> <p>a) identification of spill management prevention plans, and confirm emergency response plans for all construction sites of all five subproject components;</p> <p>b) no disturbance or damage to culture property and values;</p> <p>c) minimal acquisition of agriculture and forested lands;</p> <p>d) ensure quantity and quality of proposed raw groundwater for WTP is sustainable, and that increased wastewater that is generated can be accommodated by future wastewater management in Moc Bai;</p> <p>e) ensure groundwater will not be sensitive to construction of WWTP, and that planned treated effluent quality from WWTP will not pollute the Vam Co Dong river.</p> <p>f) locate aggregate borrow pits and rock supply areas away from human settlements with fencing and access barriers;</p> <p>g) no, or minimal disruption to water supply, utilities, and electricity with contingency plans for unavoidable disruptions;</p> <p>h) no, or minimal disruption to normal pedestrian and vehicle traffic along all road segments with contingency alternate routes;</p> <p>i) for urban areas include specific plan to notify & provide merchants and residents of construction activities & schedule to minimize disruption to normal commercial and residential activities.</p>	Final siting	Before construction initiated	Once with detailed designs documents	DDSC	IA/PMU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Update EMP	Positive environmental impacts	5. Review final sites for WTP and WWTP to confirm potential impacts on environment during construction & operation of plants. 6. Update baseline water quality, and human uses of Vam Co Dong river at discharge site for treated effluent from WWTP (See Environmental Monitoring Plan below). 7. Review finalized locations of all subproject investment sites to confirm absence of valued ecological or cultural resources, or critical habitat. 8. Identify any new potential impacts of subproject investments and include in EMP with special attention to Vam Co Dong river. 9. Update mitigation measures and monitoring requirements of EMP where necessary to meet detailed designs, and affected environments. 10. Submit updated EMP with new potential impacts to ADB to review. 11. Develop individual management subplans for: a) Construction drainage; b) Erosion; c) Noise and Dust; d) Contaminated Spoil Disposal; e) Solid and Liquid Waste Disposal; f) Construction & Urban Traffic; g) Utility and Power Disruption; h) Worker and Public Safety; i) Tree and Vegetation Removal and Site Restoration; j) Construction Materials Acquisition, Transport, & Storage, k) Cultural chance finds; l) sedimentation & pollution of surface waters during construction; and m) a UXO sweep & clearance subplan.	All sites	Before construction initiated	Once with detailed designs documents	DDSC	IA/PMU
UXO survey, & removal	Injured worker or public	12. Ensure GoV military is consulted and sweeps & clears areas where necessary	All construction sites.	Beginning of subproject	Once	EA/GoV	GoV
Develop bid documents	No negative environmental impact	13. Ensure updated EMP is included in contractor tender documents, and that tender documents specify requirements of EMP must be budgeted. 14. Specify in bid documents that contractor must have experience with implementing EMPs, or provide staff with the experience.	All subproject areas	Before construction begins	Once for all tenders	DDSC	PMU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Capacity development	No negative environmental impact	<p>15. Develop and schedule training plan for PMU (PIU/EMU/ECO) to be able to fully implement EMP, and to manage implementation of mitigation measures by contractors.</p> <p>16. Create awareness and training plan for contractors whom will implement mitigation measures.</p>	All subproject areas	Before construction begins	Initially, refresh later if needed	DDSC	DDSC
Recruitment of workers	Spread of sexually transmitted disease	17. Use local workers as much as possible, reducing #s of migrant worker	All work forces.	Throughout construction phase	Worker hiring stages	PMU/PIU	Contractor's bid documents
Construction Phase of Subproject Investments – General Mitigations							
Initiate EMP & subplans,	Prevent or minimize impacts	18. Initiate updated EMP including individual management subplans for different potential impact areas that are completed in pre-construction phase (see subplan guidance below).	For all construction sites	Beginning of construction	Once	DDSC	PMU/PIU & contractors
Obtain & activate permits and licenses	Prevent or minimize impacts	19. Contractors to comply with all statutory requirements set out by GoV for use of construction equipment, and operation construction plants such as concrete batching.	For all construction sites	Beginning of construction	Once	DDSC	PMU/PIU & contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Worker camps	Pollution and social problems	<p>20. Locate worker camps away from human settlements.</p> <p>21. Ensure adequate housing and waste disposal facilities including pit latrines and garbage cans.</p> <p>22. A solid waste collection program must be established and implemented that maintains a clean worker camps</p> <p>23. Locate separate pit latrines for male and female workers away from worker living and eating areas.</p> <p>24. A clean-out or infill schedule for pit latrines must be established and implemented to ensure working latrines are available at all times.</p> <p>25. Worker camps must have adequate drainage.</p> <p>26. Local food should be provided to worker camps. Guns and weapons not allowed in camps.</p> <p>27. Transient workers should not be allowed to interact with the local community. HIV Aids education should be given to workers.</p> <p>28. Camp areas must be restored to original condition after construction completed.</p>	All worker camps	Throughout construction phase	Monthly	DDSC/PMU	contractor
Training & capacity	Prevent of impacts through education	<p>29. Implement training and awareness plan for PMU (PIU/EMU/ECO) and contractors.</p>	PMU/PIU offices, construction sites	Beginning of construction	After each event	DDSC	DDSC/PIU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Implement Construction materials acquisition, transport, and storage subplan	Pollution, injury, increased traffic, disrupted access	<p>30. All borrow pits and quarries should be approved by GoV.</p> <p>31. Select pits and quarries in areas with low gradient and as close as possible to construction sites.</p> <p>32. Required aggregate volumes must be carefully calculated prior to extraction to prevent wastage.</p> <p>33. Pits and quarries should not be located near surface waters, forested areas, critical habitat for wildlife, or cultural property or values.</p> <p>34. If aggregate mining from fluvial environments is required small streams and rivers should be used, and dry alluvial plains preferred.</p> <p>35. All topsoil and overburden removed should be stockpiled for later restoration.</p> <p>36. All borrow pits and quarries should have a fence perimeter with signage to keep public away.</p> <p>37. After use pits and quarries should be dewatered and permanent fences installed with signage to keep public out, and restored as much as possible using original overburden and topsoil.</p> <p>38. Unstable slope conditions in/adjacent to the quarry or pit caused by the extractions should be rectified with tree planting.</p> <p>39. Define & schedule how materials are extracted from borrow pits and rock quarries, transported, and handled & stored at sites.</p> <p>40. Define and schedule how fabricated materials such as steel, wood structures, and scaffolding will transported and handled.</p> <p>41. All aggregate loads on trucks should be covered.</p> <p>42. Piles of aggregates at sites should be used/or removed promptly, or covered and placed in non traffic areas.</p>	For all construction areas.	Throughout construction phase	Monthly	DDSC/P MU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Asphalt production, transport, and use	Air pollution, land and water contamination, and traffic & access problems,	<p>43. Locate asphalt plant well away from all human activity and settlements, and cultural (e.g., schools, hospitals), and ecological receptors. Bitumen production and handling areas should be isolated.</p> <p>44. Contractors must be well trained and experienced with the production, handling, and application of bitumen.</p> <p>45. All spills should be cleaned immediately and handled as per hazardous waste management plan, and according to GoV regulations.</p> <p>46. Bitumen should only be spread on designated road beds, not on other land, near or in any surface waters, or near any human activities.</p> <p>47. Bitumen should not be used as a fuel.</p>	For all construction areas.	Throughout construction phase	Monthly	DDSC & PMU	contractor
Implement Spoil management subplan	Contamination of land and surface waters from excavated spoil, and construction waste	<p>48. Uncontaminated spoil to be disposed of in GoV-designated sites, which must never be in or adjacent surface waters. Designated sites must be clearly marked and identified.</p> <p>49. Spoil must not be disposed of on sloped land, near cultural property or values, ecologically important areas, or on/near any other culturally or ecologically sensitive feature.</p> <p>50. Where possible spoil should be used at other construction sites, or disposed in spent quarries or borrow pits.</p> <p>51. A record of type, estimated volume, and source of disposed spoil must be recorded.</p> <p>52. Contaminated spoil disposal must follow GoV regulations including handling, transport, treatment (if necessary), and disposal.</p> <p>53. Suspected contaminated soil must be tested, and disposed of in designated sites identified as per GoV regulations.</p> <p>54. Before treatment or disposal contaminated spoil must be covered with plastic and isolated from all human activity.</p>	All excavation areas	Throughout construction phase	Monthly	DDSC & PMU & DoNRE	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Implement Solid and liquid construction waste subplan	Contamination of land and surface waters from construction waste	<p>55. Management of general solid and liquid waste of construction will follow GoV regulations, and will cover, collection, handling, transport, recycling, and disposal of waste created from construction activities and worker force.</p> <p>56. Areas of disposal of solid and liquid waste to be determined by GoV.</p> <p>57. Disposed of waste should be catalogued for type, estimated weight, and source.</p> <p>58. Construction sites should have large garbage bins.</p> <p>59. A schedule of solid and liquid waste pickup and disposal must be established and followed that ensures construction sites are as clean as possible.</p> <p>60. Solid waste should be separated and recyclables sold to buyers in community.</p> <p><u>Hazardous Waste</u></p> <p>61. Collection, storage, transport, and disposal of hazardous waste such as used oils, gasoline, paint, and other toxics must follow GoV regulations.</p> <p>62. Wastes should be separated (e.g., hydrocarbons, batteries, paints, organic solvents)</p> <p>63. Wastes must be stored above ground in closed, well labeled, ventilated plastic bins in good condition well away from construction activity areas, all surface water, water supplies, and cultural and ecological sensitive receptors.</p> <p>64. All spills must be cleaned up completely with all contaminated soil removed and handled with by contaminated spoil subplan.</p>	All construction sites and worker camps	Throughout construction phase	Monthly	DDSC & PMU & DoNRE	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Implement Noise and dust subplan	Dust Noise	<p>65. Regularly apply wetting agents to exposed soil and construction roads.</p> <p>66. Cover or keep moist all stockpiles of construction aggregates, and all truck loads of aggregates.</p> <p>67. Minimize time that excavations and exposed soil are left open/exposed. Backfill asap.</p> <p>68. As much as possible restrict working time between 07:00 and 17:00. In particular are activities such as pile driving.</p> <p>69. Maintain equipment in proper working order</p> <p>70. Replace unnecessarily noisy vehicles and machinery.</p> <p>71. Vehicles and machinery to be turned off when not in use.</p> <p>72. Construct temporary noise barriers around excessively noisy activity areas where possible.</p>	All construction sites.	Fulltime	Monthly	DDSC & PMU	contractor
Implement Utility and power disruption subplan	Loss or disruption of utilities and services such as water supply and electricity	<p>73. Develop carefully a plan of days and locations where outages in utilities and services will occur, or are expected.</p> <p>74. Contact local utilities and services with schedule, and identify possible contingency back-up plans for outages.</p> <p>75. Contact affected community to inform them of planned outages.</p> <p>76. Try to schedule all outages during low use time such between 24:00 and 06:00.</p>	All construction sites.	Fulltime	Monthly	DDSC & PMU & Moc Bai utility company	contractor
Implement Tree and vegetation removal, and site restoration subplan	Damage or loss of trees, vegetation, and landscape	<p>77. Contact local forestry department for advice on how to minimize damage to trees and vegetation.</p> <p>78. Restrict tree and vegetation removal to within RoWs.</p> <p>79. Within RoWs minimize removals, and install protective physical barriers around trees that do not need to be removed.</p> <p>80. All RoWs to be re-vegetated and landscaped after construction completed. Consult MoF to determine the most successful restoration strategy and techniques.</p>	All construction sites.	Beginning and end of subproject	Monthly	DDSC & PMU	contractor

Subject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Implement Erosion control subplan	Land erosion	<p>81. Berms, and plastic sheet fencing should be placed around all excavations and earthwork areas.</p> <p>82. Earthworks should be conducted during dry periods.</p> <p>83. Maintain a stockpile of topsoil for immediate site restoration following backfilling.</p> <p>84. Protect exposed or cut slopes with planted vegetation, and have a slope stabilization protocol ready.</p> <p>85. Re-vegetate all soil exposure areas asap.</p>	All construction sites	Throughout construction phase	Monthly	DDSC & PMU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Implement worker and public safety subplan	Public and worker injury, and health	<p>86. Proper fencing, protective barriers, and buffer zones should be provided around all construction sites.</p> <p>87. Sufficient signage and information disclosure, and site supervisors and night guards should be placed at all sites.</p> <p>88. Worker and public safety guidelines GoV should be followed.</p> <p>89. Population near blast areas should be notified 24 hrs ahead, and evacuated well before operation. Accepted GoV blast procedures and safety measures implemented.</p> <p>90. Speed limits should be imposed on all roads used by construction vehicles.</p> <p>91. Standing water suitable for disease vector breeding should be filled in.</p> <p>92. Worker education and awareness seminars for construction hazards should be given. A construction site safety program should be developed and distributed to workers.</p> <p>93. Appropriate safety clothing and footwear should be mandatory for all construction workers.</p> <p>94. Adequate medical services must be on site or nearby all construction sites.</p> <p>95. Drinking water must be provided at all construction sites.</p> <p>96. Sufficient lighting be used during necessary night work.</p> <p>97. All construction sites should be examined daily to ensure unsafe conditions are removed.</p>	All construction sites.	Fulltime	Monthly	DDSC & PMU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Civil works	Degradation of water quality & aquatic resources	<p>98. Protective coffer dams, berms, plastic sheet fencing, or silt curtains should be placed between all earthworks and surface waters.</p> <p>99. Erosion channels must be built around aggregate stockpile areas to contain rain-induced erosion.</p> <p>100. Earthworks should be conducted during dry periods.</p> <p>101. All construction fluids such as oils, and fuels should be stored and handled well away from surface waters.</p> <p>102. No waste of any kind is to be thrown in surface waters.</p> <p>103. No washing or repair of machinery near surface waters.</p> <p>104. Pit latrines to be located well away from surface waters.</p> <p>105. No unnecessary earthworks in or adjacent to water courses.</p> <p>106. No aggregate mining from rivers or lakes.</p> <p>107. All irrigation canals and channels to be protected the same way as rivers, streams, and lakes</p>	All construction sites	Throughout construction phase	Monthly	DDSC & PMU	contractor
Civil works	Degradation of terrestrial resources	<p>108. All construction sites should be located away forested or all plantation areas as much as possible.</p> <p>109. No unnecessary cutting of trees.</p> <p>110. All construction fluids such as oils, and fuels should be stored and handled well away from forested and plantation areas.</p> <p>111. No waste of any kind is to be discarded on land or in forests/plantations.</p>	All construction sites	Throughout construction phase	Monthly	DDSC & PMU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Excavations of treatment tanks, ponds, or lagoons	Contamination of groundwater prior to future raw wastewater	126. At detailed design phase assess depth of water table, soil permeability, and sensitivity of groundwater. Install liners if required.	Finalized WWTP site	Before construction starts	Monthly	DDSC & PMU	Contractor
Construction of discharge structure(s)	Sedimentation of drainage canals & Vam Co Dong river, loss of fish habitat, land erosion & pollution	127. Minimize any civil works near Vam Co Dong river by constructing all discharge structures as much as possible on land. Minimize placement & size of concrete foundation/footings in surface waters where applicable.	All structures location & treated effluent locations	Throughout construction of discharge	Monthly	DDSC & PMU	Contractor
Construction of WWTP	Public injury, aesthetics and noise disturbance	128. Ensure that planned treed perimeter berm around WWTP including treatment ponds occurs to isolate WWTP from community is constructed. Security fence should surround entire WWTP facility inside the treed perimeter.	WWTP	Permanent	n/a	DDSC & PMU	Contractor
Post-construction Operation of WTP							
Sustainable treated water supply	Treated water not potable	129. Convert the pre-construction assessment of quantity and quality sustainability of source groundwater into a regular sampling program. (See Environmental Monitoring Plan below). 130. Develop regular program to monitor quality of treated water to ensure potability is sustained (See Performance Monitoring below)	Before distribution network	Regular monitoring	Quarterly	"Moc Bai water company" / MoH	
	Treated water cannot meet demand	131. Regularly monitor the use (demand) of potable water, to ensure shortfalls in supply do not occur 132. Develop and implement O&M manual for all equipment and operations of water supply system which includes regular maintenance of treatment system components, and materials supply to ensure treated water production (m³/day) always meets demand and quality specifications. Incorporate contingency and back-up plans for planned and unplanned system shutdowns.	At different points along distribution network Throughout system	Regular monitoring,	Quarterly	"Moc Bai water company"	

Subject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
Operation of raw & treated water pipelines	Local flooding from ruptures	133. As part of implementation of O&M manual for water supply systems instate a regular inspection program of all pipeline networks starting at intakes and ending at distribution networks focusing on junctions and end-user connections.	At all pipeline locations	Quarterly, and as needed	As needed	"Moc Bai water company"	
Operation of WTP	Chemical spills, and pollution from solid and domestic waste	134. As part of O&M manual provide clear methods and procedures for safe handling and storage of planned treatment chemicals defined e.g., chlorine in designated chemical & chlorine storage areas house on WTP property, including spills action plan. 135. With O&M manual define and implement a formal solid and domestic waste collection and disposal protocol for all WTP activities.	At WTP	Continuously	As needed	"Moc Bai water company"	
Management of WTP sludge	Contamination final discharge locations, e.g., river or land area	136. Review plans for sludge disposal for WTP, and design sludge drying & disinfecting technology at WTP if feasible. 137. Review and clarify with DoNRE the appropriate landfill location to dispose of the sludge produced at the WTP. 138. Never dump or temporarily store sludge on lands outside landfill site, WTP property, or near water courses. 139. Ensure sludge is covered when transported to designated landfill. 140. Develop and implement regular sludge quality monitoring to document sludge quality (See Environmental Monitoring Plan)	At WTP	Continuously	As needed	"Moc Bai water company"	
Production of treated water	Wastewater production too much for wastewater management	141. Estimate wastewater loads generated from new water supply system to determine whether downstream wastewater pollution could occur .	Downstream of WTP	Once, then periodically	As needed	"Moc Bai water company"	
Operation of entire WS system,	Worker and public injury	142. With O&M manual educate workers in workplace safety of WS system operation according to DoLISA regulations (Table 4). Prevent public access to all intake areas, pipeline corridors, WTP, & distribution	WTP and all pipeline / network property	Continuously	As needed	"Moc Bai water company"	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
		signage. 143. Enforce WTP truck drivers to follow speed limits on roads and highways. Provide adequate signage informing public of WTP truck traffic routes, and pipelines service routes. 144. Ensure all WS system vehicles in good working order.	WTP areas				
Post-construction Operation of WWTP and Facilities							
Operation of WWTP, pipelines, & discharge	Land and surface water pollution	145. Ensure all treatment process, pipeline, and WWTP equipment stays in good working order.	WWTP & below discharge points	Continuously	Biannually		"Moc Bai Wastewater Treatment"
Operation of WWTP	Land and water pollution	146. Develop and implement a regular testing protocol for the quality of disposed sludge and discharged treated effluent.	Sludge beds at discharge	Periodically	Biannually		DoNRE / "Moc Bai Wastewater Treatment"
Operation of WWTP	Land and water pollution	147. Develop O&M manual for entire WT system outlining engineering and management systems to prevent and manage emergency spills and wastewater discharge situations.	WWTP & pipelines	Continuously	Biannually		"Moc Bai Wastewater Treatment"
Operation of WWTP	Groundwater and soil pollution	148. Designed treatment lagoons/tanks/ponds that do not contaminate groundwater or underlying soil	Aerobic ponds	Continuously	Biannually		"Moc Bai Wastewater Treatment"
Operation of WWTP, pipelines, & discharge	Worker and public injury	149. As part of O&M manual development, educate workers in workplace safety. Prevent public access to WWTP property and pipeline areas, and discharge areas with fencing and warning signage.	WWTP and pipelines	Continuously	Biannually		"Moc Bai Wastewater Treatment"
Operation of WWTP, pipelines, & discharge	Emergency spills and untreated sludge & effluent discharges	150. Regularly review accident prevention management plan, and test emergency response plan for equipment failure and spills.	WWTP, pipelines, discharge	Periodically	Biannually		"Moc Bai Wastewater Treatment"
Operation	Vector	151. Conduct regular pest control	WWTP	Periodically	Biannually		"Moc Bai Wastewater Treatment"

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Supervision	Implementation
WWTP	disease	possible		ally	I		
Operation of WWTP, pipeline s, & discharge	Sickness caused by operation of WWTP and pipeline network	152. Coordinate with local public health officials to monitor incidence of water and air-borne sickness or disease in the local community and worker force that could be caused by the operation of WWTP and pipeline network	Areas affected by WWTP & pipeline network	fulltime	Biannua l	DoH / "Moc Bai Wastewater Treatment"	
Operation of WWTP, pipeline s, & discharge	Air, surface water, and groundwater pollution caused by operation of WWTP & pipelines	153. Coordinate with DoNRE for regular monitoring of the water quality of the drainage canals and Vam Co Dong river into which treated effluent is discharged, and also the quality of local groundwater and ambient air that potentially are influenced by WWTP & pipelines.	Areas affected by WWTP & pipeline network	biannual ly	Annual	DoNRE / "Moc Bai Wastewater Treatment"	
Post-construction Operation of Upgraded Roads & MRF							
Operation of upgrade d roads & MRF in Moc Bai	Increased risk of accident or injury.	154. Enforce well marked speed limits, provide guard rails along road, and educate public on new road safety including access road to MRF.	New or upgrade d roads,	Fulltime	Biannua l	DoT / CPC	
	Increased air pollution & noise	155. Enforce speed limits, ensure vehicles maintained in proper working condition, including vehicles using MRF.	New or upgrade d roads	Periodic checks	Biannua l	DoT / CPC	

V. MONITORING PLAN

24. The environmental monitoring plan for the EMP is provided in Table 5. The monitoring plan focuses on all three phases (pre-construction, construction, post-construction operation) of the subproject and consists of environmental indicators, the sampling locations & frequency, method of data collection, responsible parties, and estimated costs. The purpose of the monitoring plan is to determine the effectiveness of the impact mitigations, and to document any unexpected positive or negative environmental impacts of the subproject. The estimated costs for monitoring need to be reviewed and updated during detailed design phase.

A. Environmental Policy and Standards for Subproject Investments

25. The key environmental protection laws, policy, and environmental standards that need to be followed with the implementation of the EMP are listed in Table 4 including standards for domestic wastewater discharge for worker camps, and allowable contaminants in excavated soil for disposal are also provided.

Table 4. Applicable Laws, Policy and Environmental Standards

GoV Laws
<ul style="list-style-type: none"> • Law on Environmental Protection (LEP) No. 52/2005/QH11 • Law on Water Resources No 08/1998/QH10 • Law on Construction (LoC) No. 16/2003/QH11 • Cultural Heritage Law 28/2001/QH10 dated 29th June 2001 • Biodiversity Law 20/2008/QH12 dated 13th November 2008 • Land law No.13/2003/QH11 dated 26th November 2003
GoV Decrees & Circulars
<ul style="list-style-type: none"> • Decree No. 12/2009/ND-CP on managing construction and investment projects • Decree No. 209/2004/ND-CP dated 16th December 2004 on managing the quality of construction projects. • Decree 110/2002/ND-CP, supplementing some articles of Decree 06/1995 on labour code of occupational safety and health • Decree 06/1995, elaborating provisions of labour code on occupational safety and health. • Decree No. 149/2004/NĐ-CP dated 27/07/2004 on regulation of licensing to invest, exploit, use water resource, discharge wastewater in water source. • Decree No. 59/2007/NĐ-CP dated 09/04/2007 on solid waste management. • Decree No. 88/2007/NĐ-CP dated 28/05/2007 of Government of Drainage in Industrial Park and Urban Area • Decree No. 35/2003/NĐ-CP dated 4/4/2003 of Government on detail regulations for implementing some articles of the Law of Fire Prevention and Fighting. • Circular No. 37/2005/TT-BLĐTBXH dated 29/12/2005 of Ministry of Labour, War Invalids and Social Welfare instructing training for work safety and labor sanitation.

<ul style="list-style-type: none"> • Circular No. 02/2005/TT-BTNMT dated 24/6/2005 of MONRE instructing the implementation of licensing for investigation, exploitation, using water resource, discharging wastewater into receiving source. • Circular No. 12/2011/TT-BTNMT dated 14/04/2011 of MONRE on conditions to set up procedures, registration, licensing, giving code for hazardous solid waste management.
International Guidelines
<ul style="list-style-type: none"> • World Bank Group, 2007. Environmental Health and Safety Guidelines, Wash. DC. • AWWA Standard Methods for Measurement & Analysis Environmental Quality
GoV Environmental Standards & Methods
<p><u>Water quality:</u></p> <ul style="list-style-type: none"> • QCVN 01:2008/BYT – National technical regulations on quality of drinking water • QCVN 08:2008/BTNMT – National technical regulations on quality of surface water • QCVN 09:2008/BTNMT – National technical regulations on quality of groundwater • QCVN 10:2008/BTNMT – National technical regulations on quality of about coastal water • QCVN 14:2008/BTNMT – National technical regulations on quality of domestic wastewater • QCVN 24:2008/BTNMT– Industrial wastewater discharge standards • QCVN 02:2009/BYT: - National standard of domestic water supply • TCVN 5502:2003 – Supplied water – Requirements for quality • TCVN 6773:2000 – Water quality – Water quality for irrigational purposes • TCVN 6774:2000 – Water quality – Water quality for aquaculture protection • TCVN 7222:2002 – Water quality for concentrated domestic WWTP • TCVN / QCVN – Standard methods for analyzing environmental quality <p><u>Air Quality:</u></p> <ul style="list-style-type: none"> • QCVN 05:2008 – Standards for ambient air quality • QCVN 06:2008 – Maximum allowable concentration of hazardous substances in the ambient air • TCVN 6438:2001 – Maximum permitted emission limits of exhausted gases from vehicles <p><u>Solid Waste Management:</u></p> <ul style="list-style-type: none"> • TCVN 6696:2009 – Solid waste – Sanitary landfill. General requirements for environmental protection. • QCVN 07:2009– National technical regulations for classification of hazardous wastes • QCVN 25:2009 – National technical regulations for wastewater of solid waste sites • QCVN 15:2008/BTNMT: - National regulation on allowable pesticide residues in soil • QCVN 03:2008/BTNMT: - National regulation heavy metals concentrations in soil <p><u>Vibration and Noise:</u></p> <ul style="list-style-type: none"> • QCVN 26:2010/BTNMT: national technical standard for noise • TCVN 6962: 2001 Allowable vibration level for public and residential areas • TCVN 6962:2001: - Allowable vibration and shock from construction activities

26. An independent national environmental monitoring consultant (EMC) will be required to implement the environmental monitoring program. The PMU/PIU will provide logistical support to the EMC where necessary for the implementation of environmental monitoring plan.

27. After the construction phase is completed and the four subproject investments are in operation the impact of the new infrastructure developments on traffic patterns and urban development should be monitored by the EA. The effect of the new WWTP on groundwater quality, and the water quality of the Vam Co Dong river should be monitored as well as the quality of treated effluent from the WWTP. The sustainability of potable water quality from new WTP needs to be monitored starting with the quality and quantity of the raw groundwater supply for the WTP.

28. Monitoring the success of the resettlement the few households in Moc Bai, and the temporary relocation of secondary structures will be undertaken as part of the separate RAP prepared for the subproject.

B. Performance Monitoring

29. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the entire subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 6.

VI. REPORTING

30. Regular reporting on the implementation of mitigation measures, and on monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of PMU and should be conducted in conjunction with the regular meetings with stakeholders as part of the stakeholder communication strategy.

31. The mitigation and monitoring plans (Tables 3 and 5) summarize proposed timing of reporting. Environmental monitoring reports will be prepared quarterly for the EA by the PMU/PIU/ECOs and sent to the DoNRE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 6), and will include relevant GoV environmental quality standards.

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Costs ³ (USD)
					Supervision	Implementation	
Pre-construction Phase – Update Baseline Conditions							
Update baseline on sensitive receptors (e.g., cultural property & values, new schools or hospitals, rare/endangered species, critical habitat), and aquatic resources and human uses of Vam Co Dong river.	At final locations of all components of the four infrastructure investments.	Original field work, and resumption of community consultations that were initiated for IEE.	Once	Once	EA/PMU	Environmental Monitoring Consultant	\$3,000.00
A) Air quality: dust, CO, NOx, SOx, noise, wind, temperature, and vibration levels B) Surface water and groundwater quality: TSS, heavy metals (As, Cd, Pb,) oil and grease, total & faecal coliform, pH, DO, COD, BOD ₅ , temperature, TDS, NH ₃ , NH ₄ , other nutrient forms of N & P.	A): At construction sites at each investment site B): Vam Co Dong river above & below final WWTP effluent discharge sites, and at all other surface waters affected by infrastructure investments. Groundwater quality and yield should be measures at sites of WWTP and WTP.	Using field and analytical methods approved by DoNRE.	(A & B): One day and one night measurement during rainy & dry seasons.	One baseline supplement report before construction phase starts	PMU	Environmental Monitoring Consultant	\$5,000.00
Inventory of present and past land uses that could cause contaminated soil.	Possible contaminated lands at all excavation sites	Using field and analytical methods approved by DoNRE.	Once	Once	PMU	Environmental Monitoring Consultant	\$750.00
Presence of UXO	At all excavation sites throughout subproject area	Military to survey and sweep affected areas of UXO	Once	Once	PPC / PMU	military	tbd.
Updated, & expanded community stakeholder comments & concerns of subproject	At easily accessible sites at all investment sites	Following consultation format and procedures established for IEE.	At least once & in conjunction with Grievan	At each location for each event	PPC / PMU	PMU	\$5,000.

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Costs ³ (USD)
					Supervision	Implementation	
Groundwater quality and yield: TSS, heavy metals (As, Cd, Pb,) oil and grease, total & faecal coliform, pH, DO, COD, BOD ₅ , temperature, TDS, NH ₃ , NH ₄ , other nutrient forms of N & P, and volume (m ³ /hr)	At withdrawal sites	Using field and analytical methods approved by DoNRE.	Quarterly for 5 years	Biannually	DoNRE	DoNRE / "Moc Bai water supply company"	\$5,000.00 / yr
Treated water quality: TSS, heavy metals (As, Cd, Pb,) oil and grease, total & faecal coliform, pH, DO, COD, BOD ₅ , temperature, TDS, NH ₃ , NH ₄ , other nutrient forms of N & P.	At random locations along distribution network.	Using field and analytical methods approved by DoNRE.	Quarterly for 5 years	Biannually	DoNRE	MoH / "Moc Bai water supply company"	\$5,000.00 / yr
Worker & public injury associated with port operations	On property of WTP.	Regular record keeping	Continuously	For each event	"Moc Bai water supply company" / community NGOs		No marginal cost
Operation of WWTP and Pipelines							
Air quality: dust, noise CO, NOx, SOx ,and vibration levels	At WWTP	Using field and analytical methods approved by MoNRE.	Quarterly for 5 years	Biannual	DoNRE / "Moc Bai Wastewater Treatment Co."		\$3,600.00 / yr
WWTP effluent quality: TSS, heavy metals (As, Cd, Pb,) oil and grease, total & faecal coliform, pH, DO, COD, BOD ₅ , temperature, TDS, NH ₃ , NH ₄ , other nutrient forms of N & P.	At finalized effluent discharge sites at drainage canals	Using field and analytical methods approved by MoNRE.	Quarterly, or when public complaint arises	For each event	DoNRE / "Moc Bai Wastewater Treatment Co."		\$5,000.00 / yr
Ambient water quality of receiving environments, and groundwater quality: TSS, heavy metals (As, Cd, Pb,) oil and grease, total & faecal coliform, pH, DO, COD, BOD ₅ , temperature, TDS, NH ₃ , NH ₄ , other nutrient forms of N & P, sulphides, surfactants.	In Vam Co Dong river above and below WWTP effluent discharge sites from drainage canals. Groundwater at same domestic wells sampled during pre-construction phase near the WWTP, and at location of WWTP sludge disposal	Using field and analytical methods approved by MoNRE.	Quarterly for 5 years	Biannually	DoNRE / "Moc Bai Wastewater Treatment Co."		\$6,000.00 / yr

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Costs ³ (USD)
					Supervision	Implementation	
WWTP sludge quality: ToC, heavy metals (As, Cd, Pb), coliforms, pH, BOD, and nutrients (N&P)	After removal from ponds and before disposal at designated landfill or agricultural fields	Using field and analytical methods approved by MoNRE.	Quarterly for 5 years	Biannually	DoNRE / "Moc Bai Wastewater Treatment Co."		\$4,000.00 / yr
Worker & public injury associated with WWTP & pipeline networks	On property of WWTPs, & pipelines.	Regular record keeping	Continuously	For each event	DoNRE / "Moc Bai Wastewater Treatment Co."		No marginal cost
Operation of Upgraded Roads & MRF							
Air quality: dust, CO, NOx, SOx, noise and vibration levels	Baseline sites of pre-construction phase.	Using field and analytical methods approved by DoNRE.	Quarterly for 5 years	Biannual	DoNRE / DoT		\$3,600.00 / yr
Traffic accidents	New or upgraded roads.	Regular record keeping.	Continuously	For each event	DoT / NGOs / CPC		No marginal cost
Incidence of flooding	Adjacent to new or upgraded roads	Surveys, public complaints	Seasonal for 5 years	Seasonal	DoT / NGOs / CPC		No marginal cost

Table 6. Performance Monitoring Indicators for Moc Bai Subproject

Major Environmental Component	Key Indicator	Performance Objective	Data Source
Pre-construction Phase			
Public Consultation & Disclosure	Affected public & stakeholders	Meetings with stakeholders contacted during IEE & new stakeholders convened for follow-up consultation & to introduce grievance mechanism	Minutes of meeting, and participants list
EMP	Updated EMP	All stakeholders contacted during IEE re-contacted for follow-up consultation	EMP
Bid Documents	Requirements of EMP (CEMP ⁴)	EMP appended to bidding documents with clear instructions to bidders for CEMP	Bid documents
Training of PMU/PIU/ECO	Training course(s) & schedule	By end of P-C phase, required course(s) that will be delivered are designed and scheduled	Course(s) outline, participants, and schedule
Construction Phase			
All subproject areas	Critical habitat, rare or endangered species <i>if present</i>	All <i>present</i> critical habitat and R & E species if unchanged, and unharmed	Monitoring by EMC ⁵
Water quality of affected surface waters	TSS, DO, BOD, COD, pH, oil & grease, nutrient forms of T & N, metals (Pb, Fe, As	GoV environmental standards & criteria met (Table 4)	Monitoring by EMC
Air quality	SOx, NOx, dust, , CO, noise, vibration at all construction sites	Levels never exceed pre-construction baseline levels	EMC & contractor monitoring reports,
Soil quality	Solid & liquid waste from all construction activities including camps	Rigorous program of procedures & rules to collect and store all waste from construction camps and sites practiced.	Contractor and EMC monitoring reports
Hazardous materials & waste	Oil, gasoline, grease, alum, chlorine, soda, as above	Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	Contractor and EMC monitoring reports
Public & worker safety	Frequency of injuries	Adherence to GoV policy and site-specific procedures to	Contractor reports

⁴ Contractor Environmental Management Plan developed from EMP in contractor bidding document

⁵ Environmental Monitoring Consultant hired to implement Environmental Monitoring Plan

Major Environmental Component	Key Indicator	Performance Objective	Data Source
		prevent accidents (Table 4)	
Cultural property	Incidence of damage, or complaints	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, contractor reports, public input, EMC reports
Vehicle traffic	Frequency of disruptions & blocked roadways	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
Operation of WTP, WWTP, Upgraded Roads, & MRF			
Quality & quantity of raw groundwater for WTP	Quality & quantity requirements to sustain potable supply	Treatable to potable standards	Plant operators, MoH
Treated water quality from WTP	Taste, incidence of diarrhea	Drinking water standard of MoH	Reports by MoH, public input, DoNRE
Quality of treated effluent from WWTP	Incidence of pollution in Vam Co Dong river, public complaints	Target GoV standard for treated effluent (see FS report)	DoNRE reports, public input
Water quality of drainage canals & Vam Co river	Contamination from WWTP	Solid and domestic waste, and hazardous port cargo managed to design specifications, and O&M for port	DoNRE inspections, DoT / port reports
Worker, public health & safety at WTP and WWTP	Exposure and hazardous activities & equipment	No accidents will occur following procedures of O&M manual for port operations.	Public input, plant operator reports, worker input
Traffic safety	Frequency of accidents	No increase in pre-construction frequency	Public input, DoT / CPC
Air quality	SOx, NOx, dust, , CO, noise, along upgraded roads	Levels never exceed pre-construction baseline levels	Public input DoNRE,

VII. ESTIMATED COST OF EMP

32. The marginal costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included with the construction costs in contractor bid documents.

33. Estimated costs for field sampling and laboratory analyses for the Monitoring Plan during pre-construction phase to supplement the baseline are \$13,750. which does not include UXO survey & removal by military. Monitoring costs per year during construction phase are estimated at \$41,000., and \$32,200. annually for the 3-5 year period from beginning of operation phase. All estimated costs are preliminary, and based on the national cost norms for environmental

sampling and analyses (Circular 83/2002/TT-BTC). All cost estimates need to be updated with the EMP at detailed design stage.

34. An estimated budget of USD\$11,000., is required for capacity building for environmental management. The costs will need to be updated by the DDSC in conjunction with the PMU during the pre-construction phase.

VIII. EMERGENCY RESPONSE PLAN

35. The Contractor must develop emergency or incident response procedures during construction. In the operational phase the operator/civil authorities will have responsibility for any emergencies or serious incidents. The construction phase should ensure:

- i) Emergency Response Team (ERT) of the Contractor as initial responder;
- ii) the District and City fire and police departments, emergency medical service, the Department of Health (DoH), collectively referred to as the External Emergency Response Team (EERT), as ultimate responders.

36. The Contractor will provide and sustain the required technical, human and financial resources for quick response during construction.

Table 7. Roles and Responsibilities in Emergency Incident Response

Entity	Responsibilities
Contractor Team (ERT)	<ul style="list-style-type: none"> - Communicates / alerts the EERT. - Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site. - When necessary & requested by the EERT, lends support / provides assistance during EERT's response operations.
External Emergency Response Team (EERT)	<ul style="list-style-type: none"> - Solves the emergency/incident
Contractor Resources	<ul style="list-style-type: none"> - Provide and sustain the people, equipment, tools & funds necessary to ensure Subproject's quick response to emergency situations. - Maintain good communication lines with the EERT to ensure prompt help response & adequate protection, by keeping them informed of Subproject progress.

37. The ERT will be led by the senior Contractor engineer (designated ERTL) on site with a suitably trained foreman or junior engineer as deputy. Trained first-aiders and security crew will be the core members of the ERT.

38. The Contractor will ensure that ERT members are physically, technically and psychologically fit for their emergency response roles and responsibilities.

39. Prior to the mobilization of civil works, the Contractor, through its Construction Manager, ERTL, in coordination with the PMU/PCU, will meet with the ultimate response institutions to discuss the overall construction process, including, but not limited to:

- i) Subproject sites;
- ii) construction time frame and phasing;
- iii) any special construction techniques and equipment that will be used; i
- iv) any hazardous materials that will be brought to and stored in the construction premise and details on their applications and handling/management system;
- v) the Contractor's Emergency Management Plan
- vi) names and contact details of the ERT members

40. The objective of this meeting is to provide the ultimate response institutions the context for:

- i) their comments on the adequacy of the respective Emergency Management Plans
- ii) their own assessment of what types, likely magnitude and likely incidence rate of potential hazards are anticipated
- iii) the arrangements for coordination and collaboration.

41. To ensure effective emergency response, prior to mobilization of civil works, the Contractor will:

- i) set up the ERT;
- ii) set up all support equipment and facilities in working condition
- iii) made arrangements with the EERT;
- iv) conducted proper training of ERT members, and encouraged and trained volunteers from the work force; v) conducted orientation to all construction workers on the emergency response procedures and facilities, particularly evacuation procedures, evacuation routes, evacuation assembly points, and self-first response, among others; and vi) conducted drills for different possible situations.

42. To sustain effective emergency response throughout Subproject implementation an adequate budget shall be provided to sustain the capabilities and efficiency of the emergency response mechanism, the emergency response equipment, tools, facilities and supplies. Drills and reminders will take place regularly, the former at least every two months and the latter at least every month.

A. Alert Procedures

43. Means of communicating, reporting and alerting an emergency situation may be any combination of the following: i) audible alarm (siren, bell or gong); ii) visual alarm (blinking/rotating red light or orange safety flag); iii) telephone (landline); iv) mobile phone; v) two-way radio; and vi) public address system/loud speakers. Some rules relative to communicating/alerting will be:

- (i) Whoever detects an emergency situation first shall immediately :
 - call the attention of other people in the emergency site,
 - sound the nearest alarm, and/or
 - report/communicate the emergency situation to the ERT.

- (ii) Only the ERTL and, if ERTL is not available, the Deputy ERTL are authorized to communicate with the EERT. Exceptional cases to this rule may be necessary and should be defined in the Emergency Management Plans.
- (iii) When communicating/alerting an emergency to the EERT, it is important to provide them with at least: i) the type of emergency situation; ii) correct location of the emergency; iii) estimated magnitude of the situation; iv) estimated persons harmed; v) time it happened; vi) in case of a spill, which hazardous substance spilled; and vii) in case of fire and explosion, what caused it. Such details would allow the EERT to prepare for the appropriate response actions.

For an effective reporting/alerting of an emergency situation:

- (i) The names and contact details of the relevant persons and institutions should be readily available in, or near to, all forms of communication equipment, and strategically posted (at legible size) in all Subproject sites and vehicles:
 - Most relevant construction/operations staffs namely, the ERTL, Deputy ERTL, first-aiders, supervising engineers, foremen
 - EERT institutions/organizations
 - Concerned village authority/ies
 - PMU Office, ESMU
- (ii) All Subproject sites should have good access to any combination of audible and visual alarms, landline phones, mobile phones and two-way radio communication at all times.
- (iii) Contractor's construction vehicles should also be equipped with the appropriate communication facilities.

B. Emergency Response Situations

The following tables suggest general procedures that will be refined in the final EMP during detailed design, and described in more detail in the Emergency Management Plans of the Contractor.

Table 8. Evacuation Procedure

Procedure	Remarks
<ul style="list-style-type: none"> ▪ Move out as quickly as possible as a group, but avoid panic. 	<ul style="list-style-type: none"> ▪ All workers/staff, sub-contractors, site visitors to move out, guided by the ERT.
<ul style="list-style-type: none"> ▪ Evacuate through the directed evacuation route. 	<ul style="list-style-type: none"> ▪ The safe evacuation shall have been determined fast by the ERTL/Deputy ERTL & immediately communicated to ERT members.
<ul style="list-style-type: none"> ▪ Keep moving until everyone is safely away from the emergency site and its influence area. 	<ul style="list-style-type: none"> ▪ A restricted area must be established outside the emergency site, all to stay beyond the restricted area.
<ul style="list-style-type: none"> ▪ Once outside, conduct head counts. 	<ul style="list-style-type: none"> ▪ Foremen to do head counts of their sub-groups; ERTL/Deputy ERTL of the ERT.
<ul style="list-style-type: none"> ▪ Report missing persons to EERT 	<ul style="list-style-type: none"> ▪ ERTL/Deputy ERTL to communicate

Procedure	Remarks
immediately.	with the EERT.
<ul style="list-style-type: none"> Assist the injured in evacuation & hand them over to the ERT first-aiders or EERT medical group 	<ul style="list-style-type: none"> ERT to manage injured persons to ensure proper handling.
<ul style="list-style-type: none"> If injury warrants special care, DO NOT MOVE them, unless necessary & instructed/directed by the EERT. 	<ul style="list-style-type: none"> ERTL/Deputy ERTL communicates with EERT to get instructions/directions in handling the injured.

Table 9. Response Procedure During Medical Emergency

Procedure	Remarks
<ul style="list-style-type: none"> Administer First Aid regardless of severity immediately. 	<ul style="list-style-type: none"> Fundamentals when giving First Aid: <ul style="list-style-type: none"> Safety first of both the rescuer and the victim. Do not move an injured person unless: <ul style="list-style-type: none"> victim is exposed to more danger when left where they are, e.g., during fire, chemical spill it would be impossible for EERT to aid victims in their locations, e.g., under a collapsed structure instructed or directed by the EERT. First AID to be conducted only by a person who has been properly trained in giving First Aid.
<ul style="list-style-type: none"> Call the EERT emergency medical services &/or nearest hospital. 	<ul style="list-style-type: none"> ERTL/Deputy ERTL or authorized on-site emergency communicator
<ul style="list-style-type: none"> Facilitate leading the EERT to the emergency site. 	<ul style="list-style-type: none"> ERTL/Deputy ERTL to instruct: <ul style="list-style-type: none"> an ERT member on-site to meet EERT in access road/strategic location. He/she shall hold orange safety flag to get their attention & lead them to site. Other ERT members to clear access road for smooth passage of the EERT.
<ul style="list-style-type: none"> If applicable, vacate site & influence area at once, restrict site, suspend work until further notice. 	<ul style="list-style-type: none"> Follow evacuation procedure.

Table 10. Response Procedure in Case of Fire

Procedure	Remarks
<ul style="list-style-type: none"> Alert a fire situation. 	<ul style="list-style-type: none"> Whoever detects the fire shall immediately: <ul style="list-style-type: none"> call the attention of other people in the site, sound the nearest alarm, and/or Foreman or any ERT member among the construction sub-group contacts the

Procedure	Remarks
	fire department (in this case it should be agreed on that it is alright for any ERT member in the sub-group to alert the fire department) - report/communicate the emergency situation to the ERTL/Deputy ERTL.
<ul style="list-style-type: none"> Stop all activities/operations and evacuate. 	<ul style="list-style-type: none"> All (non-ERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure.
<ul style="list-style-type: none"> Activate ERT to contain fire/control fire from spreading. 	<ul style="list-style-type: none"> Guided by the training they undertook, ERT members assigned to mitigate the fire shall assess their own safety situation first before attempting to control fire spread.
<ul style="list-style-type: none"> Call the nearest fire & police stations &, if applicable, emergency medical services. 	<ul style="list-style-type: none"> When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.
<ul style="list-style-type: none"> Facilitate leading the EERT to the emergency site. 	<ul style="list-style-type: none"> ERTL/Deputy ERTL to instruct: <ul style="list-style-type: none"> an ERT member to meet the EERT in the access road or strategic location and lead them to the site. He/she shall hold the orange safety flag to get their attention and lead them to the site. some ERT members to stop traffic in, & clear, the access road to facilitate passage of the EERT.
<ul style="list-style-type: none"> ERT to vacate the site as soon as their safety is assessed as in danger. 	<ul style="list-style-type: none"> Follow appropriate evacuation procedure.

IX. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

44. Currently there is little capacity for environmental assessment and management amongst subproject staff (e.g., PMU/PIU) in Moc Bai. The DDSC with assistance from the designated EMU/PMU of the subproject will develop and deliver training courses to the PIU/PMU staff. The purpose of the courses is to strengthen the ability of the PIU/PMU to oversee implementation of the EMP by construction contractors and EMC

45. The ECO who may be the only full-time environmental member of the EMU should attend training courses as required. Costs for training should be included with costs for implementation of the EMP.

46. Training also must be included for the operational phase of the rehabilitated river port and facilities. Similarly, DoT must be able to manage the environmental issues associated with the operation of the upgraded urban roads.

47. Training on the implementation of an EMP is should focus on two thematic areas. The first area should be principles environmental management focused on the potential impacts of infrastructure development on the natural and social environment. The second area should be environmental safeguard requirements of the ADB and GoV with specific focus on the EMP.

X. APPENDIX A: RECORD OF CONSULTATIONS AND DISCLOSURE

48. Consultations were undertaken at various stages/points throughout the PPTA. These are summarized in Table 5.1.1 (taken from original IEE of Moc Bai subproject).

Table 4.1.1 – Stages of Consultation during PPTA

Project stage	Purpose	Tools/Process
Inception stage	<ul style="list-style-type: none"> Identify stakeholders; Identify key poverty reduction and social development options; Identify work required (plans for action/mitigation plans, frameworks, or other measures) 	<ul style="list-style-type: none"> Incorporation of feedback on initial project concepts; Stakeholder analysis and workshops, confirm who will be involved and how; Screening of issues
SLEDPs	<ul style="list-style-type: none"> Establish levels of participation of stakeholders in current planning; Prepare socio-economic profiles; Identify existing opportunities and constraints on urban development 	<ul style="list-style-type: none"> Key informant interviews and focus group discussions; Data collection - participatory rapid appraisal (PRA) techniques; Participatory SWOT analysis
FSS	<ul style="list-style-type: none"> Confirm problem analysis; Assess needs, demands, and capacities of beneficiaries; Foster maximum positive impact for women/girls; Develop appropriate mitigation plans, frameworks or other measures if negative effects are unavoidable 	<ul style="list-style-type: none"> Data collection – PRA techniques, and household survey; Willingness/ability to pay survey; Poverty and gender analysis; Stakeholder analysis; Risk reduction options; Analysis focused on affected persons and/or communities
Draft RP/PSA preparation and reporting	<ul style="list-style-type: none"> Detailed identification of risks and impacts; Ensure social concerns are addressed in designs; Involve stakeholders in agreement on preferred design; Maximize poverty reduction and social development impact; Minimize negative impacts (RP) 	<ul style="list-style-type: none"> Consultation and PRA (incl. responses to draft PSA); Analysis; Review of action/mitigation plans or other measures Prepare SDP and GAP
Finalisation of RP/PSA, disclosure	<ul style="list-style-type: none"> Facilitate stakeholder ownership of final design; Confirm poverty reduction and social development outcomes in project design; Agreement to measures and programs included in SDP and GAP Confirm with government and development partner policies 	<ul style="list-style-type: none"> Review of design elements based on responses/comments on draft RP/PSA; Review of project compliance with requirements for action/mitigation plans, frameworks, or other measures

49. The CTDP has been prepared in a participatory manner with consultations with primary stakeholders, beneficiary communities and directly affected people/households. During the identification of priority subprojects and preparation of the SLEDPs, consultations were held with the EAs, IAs and other stakeholder agencies and organizations including representatives of the private sector (Business Associations and Chamber of Commerce), non-governmental organizations (NGOs), mass organizations (Youth Union, Women's Union) and civil society organizations (CSOs). Consultation tools include key informant interviews (KIIs), focus group discussions (FGDs), semi structured interviews, and a household survey.

50. Consultations have also been undertaken specifically for the environmental and social impact assessments in an integrated manner, and will be reported in the various reports and plans prepared for each subproject. The purpose of the consultations undertaken for the subprojects has been to; (i) introduce the CTD and subprojects; (ii) briefly identify impacts and receive feedback on the impacts and any proposed mitigation measures; (iii) disclose relevant project information (such as eligibility and entitlements for compensation, proposed SDP and GAP measures and the IEEs); and (iv) record the response of beneficiary communities to the CTD and anticipated impacts, both positive and negative.

51. A Stakeholder Communication Strategy (SCS) and Communication and Participation Plan (CPP) have been prepared for the CTD. The CPP details the consultations undertaken to date and establishes the framework for ongoing consultation and participation as the Project moves into its implementation stage.

Results of Focus Group Discussions

52. For the FS and detailed subproject discussions, consultations have been held with affected/beneficiary communities through focus group discussions (FGDs) with small groups of men and women from the communities. As described in Section 3, a household survey was also undertaken to understand the characteristics of beneficiary households and their access to urban services and facilities. As shown in Table 5.2.1, meetings were held in two locations with a total of 49 participants.

Table 5.2.1 – Consultation Meetings with Beneficiary Towns/Communes

Date	Location	No. of male participants	No. of female participants	Total
29.08.11	Ben Cau	8	8	16
03.09.11	Loi Thuan	8	9	17
04.09.11	Loi Thuan	8	8	16
Total		24	25	49

Source: PPTA Consultations (August/September 2011)

Results of Women's FGDs

53. The women's groups commented that most women of the town work in trade (especially at the border gate), small business, or in the agriculture/forestry sector exploitation, there are also many women who migrate to Ho Chi Minh City and Cambodia for seasonal work. It was noted that some women work in tourism and construction, but not very many. The women noted that their unemployment levels are not as high as those of men and their work is relatively more stable (even though many women do not earn a regular income) because men are likely to be employed in seasonal, daily labor and casual work.

54. The women noted a number of challenges and issues facing the town in terms of its development including; high unemployment and lack of job stability; lack of agricultural land and limited access to extension workers and information; problems with basic infrastructure including inadequate water supply and environmental sanitation, roads are undeveloped and in poor condition; high drop-out rates from schools (especially girls); available job opportunities for women are limited there are few "careers" available to them and therefore incomes and employment are not seen as sustainable, in particular there are no funds or support for women's development (especially for increasing skills) and lack of vocational training for changing jobs.

55. The women's groups suggested that measures to address the problems could include (by priority) improving infrastructure and services especially roads, water supply, healthcare and

wastewater treatment (and sanitation); creating jobs for people (especially women) by supporting development of industry and tourism (developing tourism activities and ventures); and provision of skills and vocational training for working-age women, especially those engaged in arduous and low-paying work such as farming.

56. Comments about the road improvement subproject included that the existing roads that provided access between the town centre and the wards/communes were in poor condition, narrow and often of only earth construction, during the rainy season (June – October) they become flooded and very difficult to pass and in the dry season dust become a real problem. There are issues with dangerous driving, especially by bus and truck drivers which are exacerbated by narrow and poor condition roads. A number of roads that have been planned for many years have never been constructed and therefore the overall network is incomplete. Travel at night is dangerous because there are no street-lights. The women noted a number of benefits, they agreed that most people in the town would benefit from upgrading the roads and installing drainage, they also commented that the upgrading will improve accessibility and ease of travel and convenience and it will also be easier for children to get to and from school. Improved access will contribute to tourism, and in general upgrading the roads and drainage will result in an improved urban environment.

57. When discussing the wastewater treatment plant and sewerage subproject the women noted that this would improve health, particularly for those people living along the currently open channels which convey wastewater, effluent and storm-water run-off, the women also noted that the sewers get blocked with rubbish because the solid waste collection service is not frequent enough. In the rainy season wastewater backs up and floods the low-lying areas and both children and adults fall ill (fever, stomach ailments and eye infections) because the flood waters (which can contain sewage and wastewater) can take a long time to recede. Stagnating pools of water are breeding grounds for mosquitoes. The women's groups considered that there would be general environmental improvements with this subproject, with a cleaner environment, exposure to various illnesses will be reduced.

58. The water supply expansion subproject received very high support, women from Loi Thuan noted that few households were connected to the town supply, only a few households in Ben Cau town were connected to the municipal supply and women had to collect water from wells or nearby rivers/streams. Even women from Ben Cau who lived in households that were connected to the town supply noted that the supply was insufficient and the quality of water received was very poor. The women noted that there was inadequate "clean and safe" water for daily needs and that use of unsafe water caused disease in both women and children. The women were very clear that was a need to both expand the supply system and improve the treatment and quality of the water delivered.

59. The women's groups identified similar potential negative impacts associated with each of the subprojects proposed in Moc Bai, these are associated with the construction works including environmental pollution, access and mobility problems (i.e. it will be difficult for people to move around during construction period, noise and dirt, creation of waste. These can be mitigated with proper implementation of the environmental management plan (EMP).

60. The women wondered if it would be possible to ensure that construction vehicles only used certain routes, the roads had been damaged by many construction trucks in the past and they wanted to avoid further any damage. Difficulties in access to the properties was raised, it was explained that, similar to the road improvement subproject, a plan would need to be devised to ensure that access was not impeded during construction.

61. The FGDs touched on climate change issues to determine whether effects had been noticed or if adaptation measures had been required. In terms of noticing changes in weather/climate, the women's FGDs stated that heavier rains and flooding occurred more frequently and took longer to recede, the rainy season/winter was longer than usual, and the summer/dry season, although shorter was hotter and drier.

62. A number of effects associated with these changes were identified; the area affected by floods increased each year; increased pollution in rivers and lakes due to flooding and erosion; larger numbers of people got sick; and flooding and erosion affected infrastructure and land (residential and agricultural). When asked to rank these changes and impacts by their significance the women overwhelmingly noted flooding as the most significant impact followed by erosion.

Results of Men's FGDs

63. According to information provided during the men's FGDs the main livelihood and business activities in the town includes trade and services, industry but mostly small-scale industry, construction, and agriculture. More than half of men of the town are involved in seasonal work such as production of building materials and unloading goods. The men commented that only few men were involved in trade or marketing. The main economic activity in Loi Thuan is agricultural production, when it is not planting or harvesting time the men hire out their labor on a casual or daily basis; the men considered that unemployment was higher for males than females and a larger proportion of men were engaged in only daily/casual work.

64. The groups note a number of socio-economic issues or pressures facing the men of the town such as; unemployment and lack of jobs in higher paying sectors; migration of people to other areas (including Cambodia) for work leaving the family without a head male; constrained market access; and poverty. In each of the FGDs unemployment and job instability was ranked as the foremost development problem or issue, lack of land for agricultural production (forcing men to work in low-paying jobs in the town) was seen as the second most pressing issue, inadequate infrastructure (roads, water supply and healthcare) was considered as the third problem, and high rates of children dropping out of secondary school was seen as the fourth issue.

65. The men's groups ranked their development priorities creating jobs and wider range of employment opportunities, improving urban infrastructure focusing on roads/drainage, water supply, improving solid waste management and health care ranked as their second priority. In Loi Thuan tackling the problems of flooding, including raising the levels of the roads, was mentioned in one of the groups. While not high on the list of priorities the men also noted lack of recreational areas and the need for a park to be created.

66. The types of interventions that could address the problems identified were very similar to those mentioned in the women's FGDs, the men's groups suggested that creating jobs by developing the tourism sector and building factories would help with unemployment, while provision of vocational training for new careers was also seen as important in addressing lack of job opportunities along with specialized training for farmers to help them improve production.

67. During discussions about the road improvement subproject it was noted that the traffic system in Moc Bai had not been upgraded in many years, only a few new roads had been constructed and while these assisted in helping move people and goods, they served only a small proportion of the population. Improved roads, including fulfilling the master plan for the road network was required; this would be beneficial for the people of the town and encourage visitors and traders which would boost many small businesses such as local contractors, street vendors and cafes and food sellers. Truck and bus drivers often drive too fast and dangerously, especially cross-border traffic, improving road conditions will help address this but better enforcement of traffic rules is also required.

68. The men identified some negative impacts, mostly associated with construction, including security issues, and waste and pollution (indiscriminate dumping of material), both of which can be mitigated through measures included in the EMP.

69. The water supply subproject was considered necessary to reduce the number of households that had to rely on water from wells, water tanks or rivers. Like the women, the men noted that only a few households used piped water from the town supply scheme. The supply system needed to be expanded to include Loi Thuan.

70. During discussions about the wastewater treatment plant and sewerage subproject, the men's groups noted that treatment plants and a well-designed pipe network were necessary to make sure the sewerage was treated and disposed of properly and also get rid of the bad odor from the drains and open channels. The men considered that the subproject would not create long-term negative impacts, just temporary ones. In the long-term the subproject would benefit the whole community.

71. With regard to climate change issues, the men's groups, like the women's groups, noted that in recent years there had been increased and more frequent flooding in the rainy season, increased and longer droughts in summer, increased extreme weather events such as storms, erosion was more prevalent, and there were changes in temperature changed (being hotter and drier in summer and colder in winter).

72. The impacts of these changes were identified as; destruction of crops due to either flooding or drought; landslides affecting roads, access and houses; erosion damaging agricultural land and important infrastructure such as roads; more mosquito and flies; increased numbers of people getting sick; and difficulties in growing the plants traditionally cultivated in agriculture.

73. People were asked how they responded to these effects, the men stated that they had been forced to change their usual agriculture productions by changing crop season as well as growing different crops (cassava), and invest in protection measures such as raising houses or relocating to higher places, sand-banking, and increasing forest protection (including re-planting).

74. When asked to prioritize the most significant negative impacts from climate/weather pattern changes, the groups each identified flooding (and raised river levels) as the major concern, followed by erosion, and increased extreme weather events damaging crops and trees.

Key Informant Interviews

75. A number of KIIs were conducted during the development of the SLEDP and further KIIs were undertaken for the PSA. The results of the KIIs are as follows.

Women's Union

76. The KII with the VWU revealed that women in the town have relatively high levels of education compared with the women in the more rural communes, including 100% of females enrolled in school, high literacy, and over 70% of women graduated from junior and high schools. In the rural and peri-urban areas the reasons that females drop-out of school include the need to assist the family by finding jobs and contributing to household income, and people's low perception of women i.e. females are not expected to perform well at school or achieve as much as the males, they are also not encouraged to "widen their horizons". Other problems faced by women in the town include lack of capital to start small businesses, lack of skills, some women become involved in social evils such as gambling, prostitution, alcohol abuse and use of drugs.

77. There has been a lack of provision of vocational or professional training for women and a lack of funds for the VWU to become actively involved in this area even though they wish to. There have been few if any foreign funded projects and limited involvement of NGOs with local women. Annually, the VWU applies for a budget to organize small training courses for women, such as literacy classes, training in cross-border trafficking awareness, and awareness raising about drugs, family violence, and environmental issues (including water and sanitation), and nutrition for children. However, due to limited funds, training courses cannot be held every year and even in a year when the courses/classes can be provided they have to target fewer women than intended.

78. The WVU also provides loans to support for small business run by women, loans for female students and poor women and funds for temporary settlements made available through the Bank of Social Policy and Agriculture and Rural Development Bank.

79. The WVU takes part in local economic development plans and programs and also participates in establishing the needs of women in the annual budget plan. The WVU expressed an urgent need for training to raise awareness of female staff so that they can participate in contributing their ideas, assisting in decision-making at higher and more meaningful levels, and providing inputs to urban planning and development.

Department of Labor, Invalids and Social Affairs

80. According to the Department of Labor, Invalids and Social Affairs (DOLISA) which is responsible for assisting households out of poverty, the poverty rate in Moc Bai ranges from 7% (TT Ben Cau), 10% in Loi Thuan and as high as 18% in An Thanh commune, the average poverty rate for the Moc Bai core urban area is 11.5%. The reason for the highest poverty rate being given that households in this area rely more heavily on agriculture than on other income generating activities or sectors.

81. Poor households in the area are eligible for professional training through the National Fund for Employment. DOLISA usually takes part in process of decision making on the province's planning and development orientation and contributes budget requirements (for training programs) and statistics for the SEDPs.

Business and Tourism Associations

82. In Ben Cau town, there are two types of enterprises (private enterprises and limited liability companies). The overall trend, as expressed by the Business Association, is a shift from industrial-based enterprises to trade and services, and this trend is expected to be followed for the next five to ten years. There are no business ventures between the private and public sectors.

83. There is no tourism authority per se in Moc Bai and tourism as a sector is not well developed. While there are some tourist attractions in the area such as Ba Den Mountain and Tay Ninh Holy Church (established by the Catholics who fled from the north in the 1950s), few tourist stay overnight in the town and the town has few hotels and guesthouses. Tourists usually make a day trip to Ben Cau town and stay overnight in Ho Chi Minh City.

Ward and Commune Leaders

84. The leaders consulted that while the infrastructure of Moc Bai town is better than surrounding communes and villages it is still insufficient for a growing town with a special trade zone that requires infrastructure and services to encourage investment which will in turn provide much needed employment opportunities.

85. There are large differences in education levels and poverty rates between the town and surrounding area, these need to be addressed and disparities reduced by improving infrastructure beyond the immediate urban area according to the master plan.

86. A number of requisite projects have not been implemented and there has been no special program for development implemented in area adjacent to the urban core.

Committee on Ethnic Minorities and Mountainous Areas

87. According to Committee for Ethnic Minority and Mountainous Areas (CEMMA) Ben Cau town and surrounding communes are predominantly comprised of Kinh ethnic group with a few households of Hoa, Cham and Khmer ethnic groups. The different ethnic groups have lived together harmoniously for many years. As there are so few ethnic minority people, there are no special festivals or different customs from the Kinh.

88. CEMMA seldom takes part in the town decision-making or participates in the preparation of SEDPs etc due to the very few ethnic minority people that live there and the fact there are no special requirements to be addressed.

Notes of Participatory Workshop

Date: 20 October 2011
Venue: Meeting Hall of Moc Bai PPC
Participants:
Highlights:

Objectives of the Workshop

- To present and disclose the following:
 - Subprojects' objectives;
 - Description of subprojects (locations, sites, design, cost estimates);
 - Environmental procedures of the ADB and the Government of Viet Nam ;
 - Environmental categories of subprojects per ADB and Government of Viet Nam policies, and;
 - Environmental and social issues/concerns relative to subproject location and design.
- To obtain feedback from participants, particularly on:
 - Environmental impacts of the subprojects and subcomponents;
 - Proposed mitigation measures; and
 - Their opinion on the proposed subprojects and subcomponents.

Feedback from Participants

In general, participants welcomed the proposed design for the subproject/subcomponent, which they deemed as necessary to improve quality of life of local people.

Description of Issue Raised	By Whom?	Reference in IEE/CEP	Required Follow-up Actions?
Dust and means of transport during construction affect rural residents	Local residents	Risks on health or safety of residents or workers	Dust should be reduced during construction, it is required to carefully drive to ensure safety for local residents, especially pupils.
Disruption of agricultural production during construction	Local residents	Income loss	Keep access roads to the fields.

Impedements to movements of local people and freight transportation	Local residents	Difficult access to service areas	Proper arrangement for civil works. Construct temporary roads for local people.
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