Updated Environmental Management Plan

May 2017

Socialist Republic of Viet Nam: Second Greater Mekong Subregion Corridor Towns Development Project

Bac Giang Subproject
Component 1: Urban road construction
Component 3: Stormwater improvements

Prepared by Bac Giang PMU for the Asian Development Bank.

ABBREVIATIONS

ADB	-	Asian Development Bank
PAH	-	Project Affected Household
BOD	-	Biological Oxygen Demand
COD	-	Chemical Oxygen Demand
CPC	-	City Peoples Committee
DCST	-	Department of Culture Sport and Tourism
DOC	-	Department of Construction
DOH	-	Department of Health
DoNRE	-	Department of Environment and Natural Resources
DOT	-	Department of Transport
DPI	-	Department of Planning and Investment
EA	-	Executing Agency
ECC	-	Environmental Compliance Certificate
EIA	-	Environment Impact Assessment
EMP	-	Environment Management Plan
EERT	-	External Emergency Response Team
EO	-	Environmental Officer
ERT	-	Emergency Response Team
ERTL	-	Emergency Response Team Leader
ESU	-	Environmental and Social Unit
IEE	-	Initial Environmental Examination
IA	-	Project Implementation Agency
GMS	-	Greater Mekong Sub-Region
GOV	-	Government of Viet Nam
NGO	-	Non-Government Organization
O&M	-	Operation and Maintenance
PIU	-	Project Implementation Unit
LISC	-	Project Implementation Supporting Consultant
PMU	-	Project Management Unit
PPC	-	Provincial Peoples Committee
PSC	-	Project Steering Committee
SO	-	Safeguards Officer
UXO	-	Unexploded Ordnance

WEIGHTS AND MEASURES

km	-	Kilometer
kg	-	Kilogram
ha	-	Hectare
m	-	Meter

NOTES

In this report "$" refers to US Dollars unless otherwise stated.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

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1. The Environmental Management Plan (EMP) for the Bac Giang subproject is among five EMPs prepared for the subprojects under the Second Greater Mekong Sub-Region Corridor Towns Development Project (CTDP) in Viet Nam. Other three EMPs are for the subprojects of Sa Pa and Mong Cai city. All these EMPs are made separately and developed as stand-alone management tools. Details of the Greater Mekong Sub-Region (GMS) and the subprojects in Viet Nam can be found in the parent IEE.

2. According to the Memorandum of ADB's project review mission (loan No.3353-VIE) from 29 July 2016 to 03 August 2016 in Lao Cai, Bac Giang and Quang Ninh for updating Environmental Impact Assessments (EIA), Environmental Management Plan (EMP), the environmental and social report of Bac Giang subproject will have to be updated. So far, the detailed design of the Component 1 - Construction of urban roads, and Component 3 - Improvement in stormwater systems, have been completed. Therefore, as a requirement of the Project Administration Manual (PAM), the updated environmental management plan (EMP) is to be submitted to ADB for clearance before the civil work contracts are awarded.

3. This combined EMP for the Component 1 and Component 3 - Improvement in stormwater systems of the subproject integrates all technical and institutional changes (compared to basic design), and information on mitigation and monitoring measures for three phases of the project implementation (pre-construction, construction and operation phases).

A. Overview of Bac Giang subproject

4. The Bac Giang subproject consists of three components:

Component 1: Construction of 02 roads with a length of about 3.2 km of priority urban roads, which include:

- Construction of Tran Quang Khai road (from the resettlement area of Ha Bac Fertilizer Plant to Hoang Hoa Tham road) with the length of 1.590m and a new road bridge across the Thong River with the length of 364,8m. Urban Roads are designed according to TCXDVN 104-2007 standard, bridge is designed according to technical standard 22TCN Bridge 272: 2005.
- Construction of North - East Ring Road (from provincial road 295B to Highway 1A) is 1.610m long. Urban road standards are TCXDVN 104-2007

(ii) **Component 2**: Extension of the current capacity of the wastewater treatment plant from 10,000m^3/day to 20,000m^3/day to meet the demand of wastewater collection and treatment for Bac Giang city to 2030.

(iii) **Component 3**: Improvement of stormwater system:

- Dredge, widen Van Son canals and new construction of Van Son and Chau Xuyen 2 pumping stations (combined capacity of 135,000 m^3/day) to strengthen the City's drainage capacity and protect Bac Giang from periodic flooding due to storm water.
- Dredge, embank and build wastewater collection system in 03 lakes of Soc Trang, Nha Dau, Banh Keo, construction of sewage systems and overflow chambers to completely collect and thoroughly treat the city's wastewater, and improve environmental sanitation and prevent water of Thuong River from receiving pollutants. The component will also provide free house connections, to 2,100 households (8,600 people) to enhance the

accessibility of households to wastewater services.

5. Total investment is approximately 40,541,000 USD, including: (i) 32,931.000 USD financed by the Asian Development Fund(ADF); and (ii) 7,610,000 USD counterpart fund.

Figure 1. Sketch of North-Eastern ring road

Figure 2. Sketch of North-Eastern ring road

Figure 3. Stormwater system improvements

Figure 4. Map of component 1 and 3 of Bac Giang Subproject

B. Detailed description of Component 1 and Component 3

6. The figures below provide detail information of the facilities to be built under Component 1 and 3. Detailed information of Component 1 and 3 are provided in the biding documents (technical specifications) and should be used as reference when developing site-specific construction environmental management plans (CEMPs).

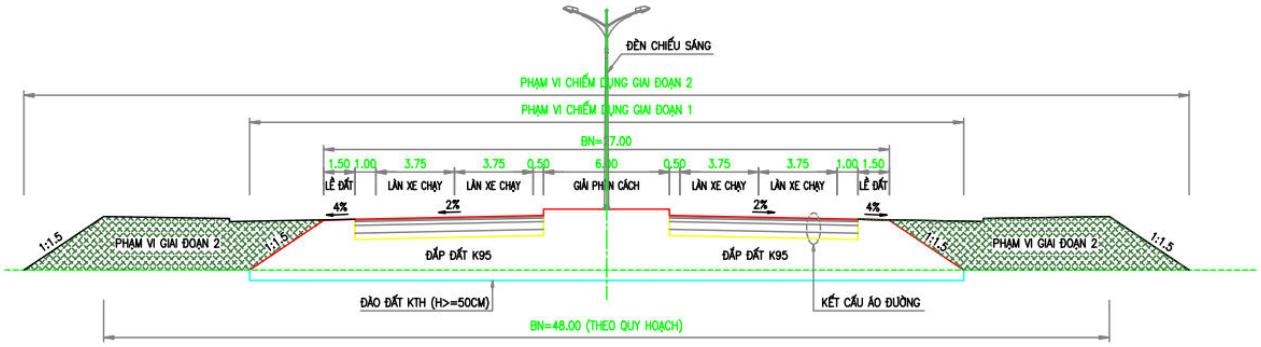

Figure 5. Cross section of segment 01, North-Eastern ring road

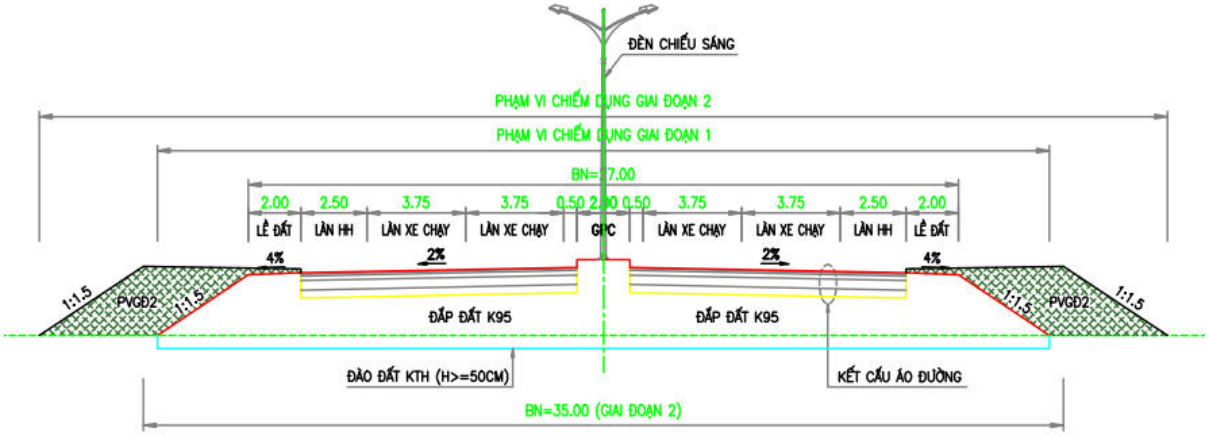

Figure 6. Cross section of segment 02, North-Eastern ring road

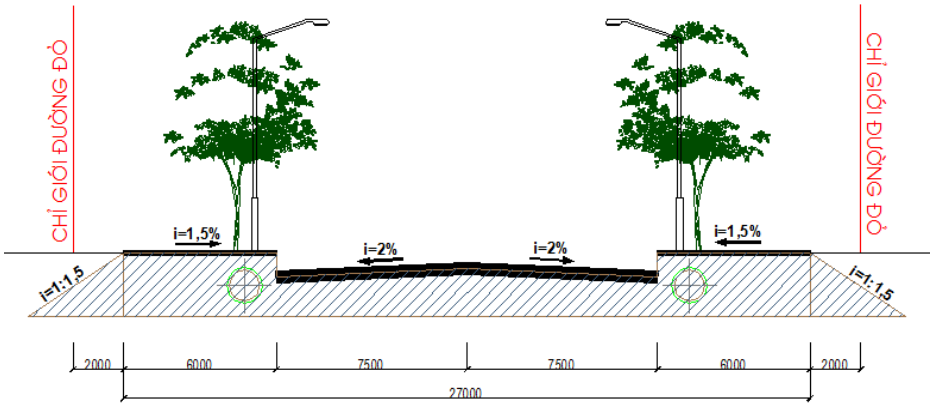

Figure 7. Cross section of segment 01, Tran Quang Khai road

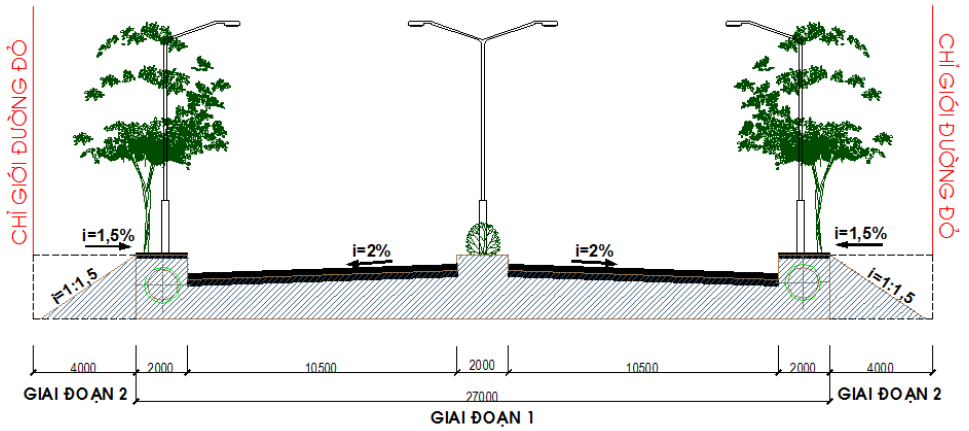

Figure. 8. Cross section of segment 02, Tran Quang Khai road

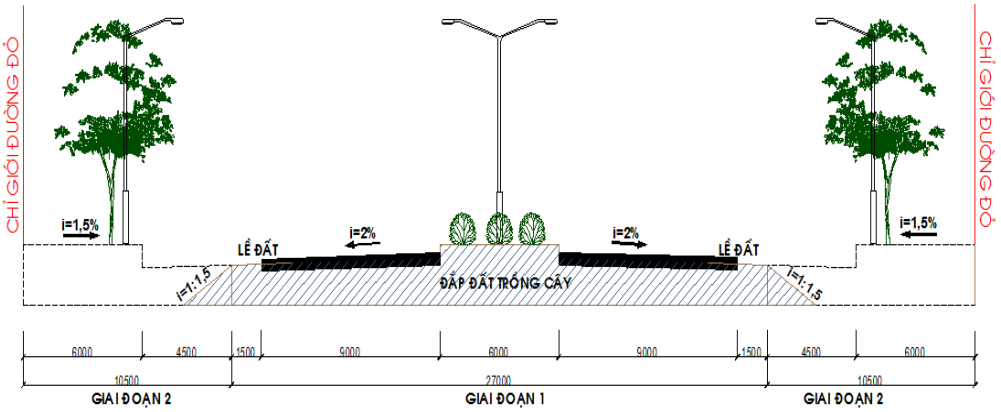

Figure 9. Cross section of segment 03, Tran Quang Khai road

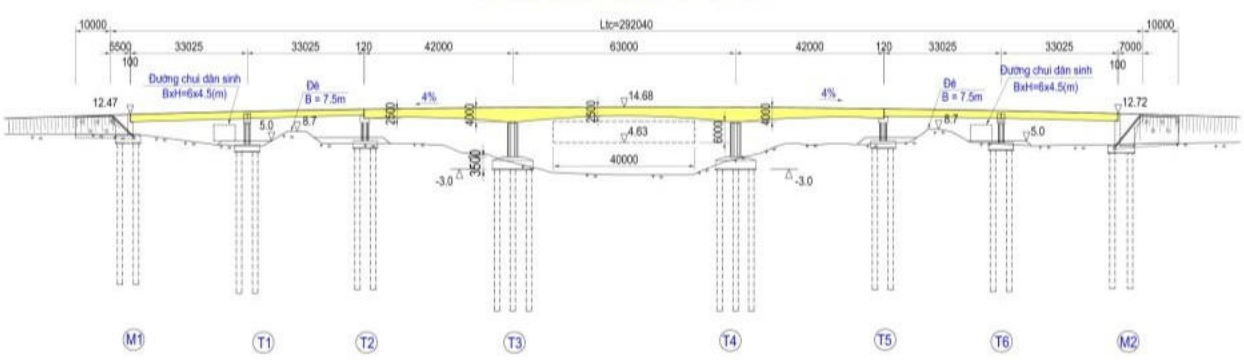

Figure 10. Layout of Ben Huong bridge (over Thuong river)

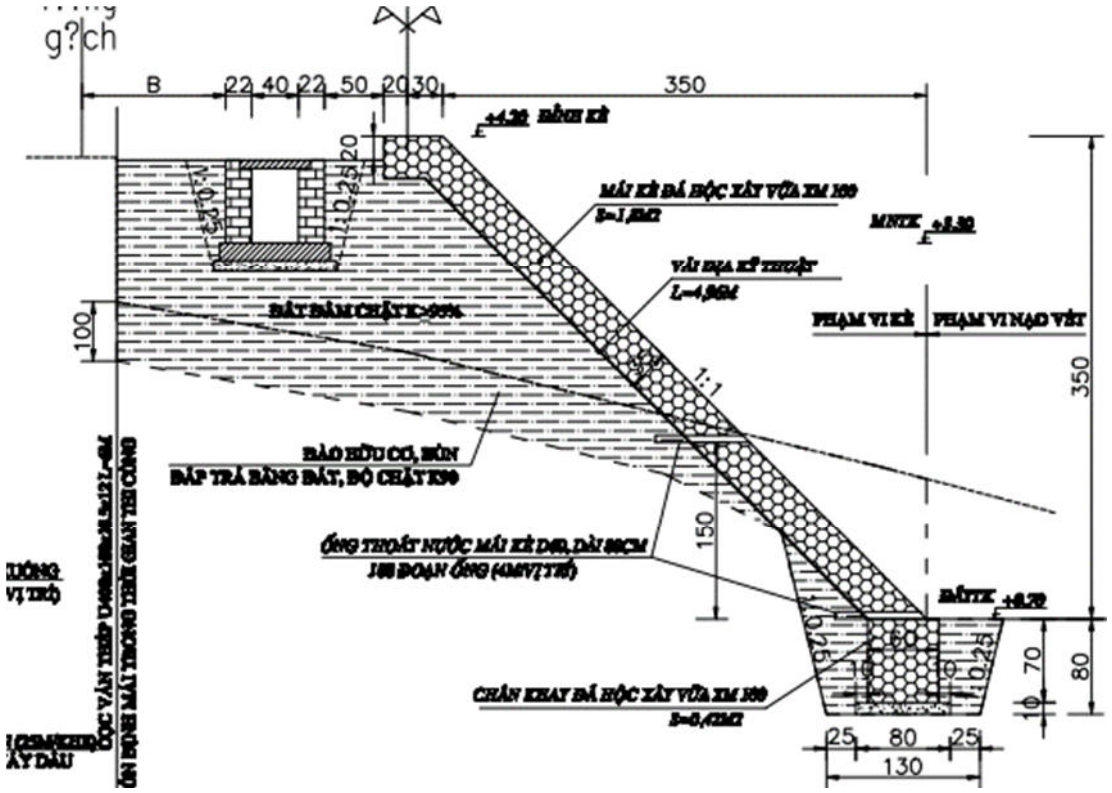

Figure 11. Cross section of a typical embankment

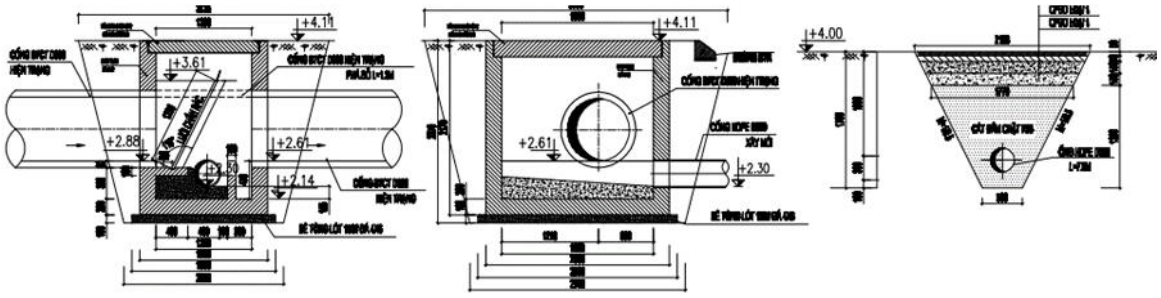

Figure 12. Cross section of a typical combined sewer overflow

❖ **Sources of construction materials**

7. **Borrow pits**: Soil for filling the road base is from the excavated volume, the shortage volume will be taken from the pit in Dau Trau mountain, Yen Lu and Nham Son commune, Yen Dung district, Bac Giang province. Bac Giang PPC has licensed Hai Phong Mineral Trading Investment Exploitation Import Export Joint Stock Company to extract until August 2019. The distance from the pit to the construction sites is 13 km to 15 km. Estimated reserves are about 4.520.000m^3, and a volume of 500.000m^3 will be annually provided for projects in Bac Giang city.

8. **Sand pit**: Sand for construction is from the depot in Ha hamlet, Song Mai, Bac Giang city, which is managed by Song Thuong Trading and Services Co., Ltd. The Company can supply at least a capacity of 200.000m^3 per month. The distance from the pit to the construction sites is 3 km to 5 km.

9. **Stone quarry**: Stone is from pits located in Ba Nang hamlet, Kai Kinh commune, Huu Lung

district, Lang Son province. Hong Phong Co., Ltd is licensed to exploit and operate the stone quarry. Daily capacity approximates 1000 m^3. The distance from this quarry to the construction sites is 40 km to 45 km.

❖ **Construction waste dumping site**

10. To ensure the convenience of the work implementation, construction safety and landscape preservation without any disturbances on surrounding environment, the Design Consultant, the Client and local authorities have identified the Da Mai landfill, located at Da Mai ward, 6 km far from the central of Bac Giang City for construction waste disposal. An agreement between PPMU and local authorities is yet to be obtained. This shall be secured before construction works start.

11. A large amount of sediment will be dredged from the ponds during construction phase, which includes:
- Soc Trang lake: 7,441.26 m^3
- Nha Dau lake: 6,626.64 m^3

12. Sediments excavated from ponds will be taken to the Da Mai landfill by canvas trucks without temporary storage or treatment at the sites.

II. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

13. The primary management framework for the implementation of the environmental management plan (EMP) for the subprojects in Bac Giang province is summarized as follows.

14. The Bac Giang Provincial Peoples Committee (PPC) which is the executing agency (EA) for the project will take overall responsibility for the successful implementation of the EMP, and will liaise with Lao Cai and Mong Cai PPMUs on the submission of consolidated environmental safeguards reports to ADB. The EA will establish a Project Steering Committee (PSC) which, *inter alia*, will provide support for implementation of the EMP.

15. The Bac Giang City Peoples Committee (CPC) will be the subproject implementation agency (IA) to oversee day to day implementation of the project including EMP implementation and reporting to the EA. The Project Management Unit (PMU) was established to support the IA. The PMU will appoint a Safety Officer (SO) to monitor the EMP implementation. PMU/SO will oversee the implementation of the site-specific Construction Environmental Management Plan (CEMP) [1] for Bac Giang Subproject. Specialists from Bac Giang Department of Transport (DOT)/Department of Construction (DOC) will be seconded to the PMU if required.

16. Supporting the PMU in updating EMP, capacity building and monitoring will be carried out by national and international Environmental Specialists under the Loan Implementation Supporting Consultant (LISC) – have been mobilized and recruited in Quarter 2/2017. LISC will be responsible to monitor environmental impacts (water quality, air quality, noise, etc.) according to the monitoring plan prepared under this updated EMP. The LISC will also oversee the preparation and implementation of contractors' site-specific construction EMPs (CEMPs). The following is summary of major responsibilities for the uEMP implementation.

17. Responsibilities of EA with support of LISC:

[1]Environmental Management Plan prepared by the contractor is part of the bids document on the basis of updated Environmental Management Plan.

- Coordinate implementation and monitoring environmental and social protection measures taken by IA/PMU;
- Work with ADB to keep track on EMP implementation; and
- Coordinate with IA/PMU and ADB to address issues in the course of EMP delivery if needed.

18. Responsibilities of Safety Officers under Bac Giang PMU:

- Inform IA/EA to confirm the project approval from the Government of Vietnam, and in line with requirements of Law on Environmental Protection (LEP) 2014 stipulated under the Decree No. 18/2015/NĐ-CP and Circular No. 27/2015/TT-BTNMT.
- Ensure that the following documents are properly referred to: CEMP in Request of Proposal, uEMP in bidding documents;
- Manage daily EMP implementation activities;
- Comply with loan agreement and ensure all components of Bac Giang Subproject, including EMP (Indigenous People Plan (IPP), Gender Action Plan (GAP), Resettlement Ethnic Minorities Development Plan (REMD);
- Chair meetings with relevant affected stakeholders;
- Prepare and submit quarterly reports on EMP implementation to LISC;
- Monitor the CEMP implementation of the Contractor;
- Work with ES of LISC for implementing EMP;
- Regularly supervise the construction to ensure the compliance of the Contractor with CEMP;
- Ensure EO/CCW of contractor submits monthly progress reports including CEMP implementation.

19. The responsibilities of the environment specialists (international and national) of the LISC are detailed in their Terms of Reference for the two positions (as per contract). The consultant's key responsibilities for environmental management are:

- Update the EMP to meet final detailed designs of subprojects;
- Supervise preparation of site-specific CEMPs by contractors. Review, clear, and supervision implementation of the CEMPs;
- Provide technical direction and support to PMU/SO for implementation of EMP; oversee design and deliver capacity development and training of PMU-SO and EO of contractor(s);
- Conduct environmental effect monitoring in compliance with the monitoring plan defined in the uEMP, or another plan as approved by PMU and ADB. Perform required laboratory analyses for monitoring program detailed in EMP; and prepare and submit quarterly reports to IA/EA on monitoring activities.
- Prepare monthly progress reports of the subproject (submit to Bac Giang PMU), quarterly progress report (submit to PMU and ADB), and biannual environment monitoring report (submit to EAs and ADB).
- Review location of any possible contaminated sites near subprojects.

20. The civil works contractor's Chief of Construction (CCW) will be responsible for all construction activities at the construction sites, including compliance with the EMP. The CCW will assign an Environmental Officer *(EO)* to ensure the contractor's responsibilities for the EMP are met. The responsibility of Chief of Construction Work (CCW) of contractor with assistance from Environmental Officer (EO) includes:

- Prepare CEMP and submit to Bac Giang PMU (through the LISC) for approval prior to starting construction works on the site.
- Ensure implementation of the CEMP during the construction phase; and
- Prepare and submit monthly project progress reports on CEMP implementation and environmental issues at construction sites

21. The LISC will recruit a qualified company/organization as a sub-contractor to conduct environmental monitoring tasks in the pre-construction and construction phases; and the responsibilities of EMC include:

- Implement the environmental sampling required for IEE update (baseline environment data) and environmental monitoring plan of EMP that cannot be conducted by the contractors, LISC and PMU.
- Perform required laboratory analyses for monitoring program detailed in EMP or additional environmental tests required by LISC
- Process and provide data on quarterly environment quality for the LISC to prepare reports for IA/EA

22. The implementation of the EMP as part of the overall environmental due diligence (DD) of the subproject is conducted alongside the separate DD of the government. Table 1 reproduces the summary of environmental due diligence from the IEE which shows that the government shall endorse the ADB's IEE and EMP by formal letter, and that endorsement of the ADB's IEE/EMP is not contingent on compliance with any specific government regulation other than the Project Detailed Outline (PDO) which is required by the Prime Minister.

Table 1. Summary of Environmental Due Diligence (DD) during project implementation

Design and Implementation	Environmental DD and Approvals			Milestones & Notes
	ADB/PPTA	**Vietnam**	**LISC/Contractor**	
Feasibility design				
Initial stakeholder disclosure & consultation	PPTA	EA assistance		
Draft IEEs and EMPs	PPTA			Draft IEEs & EMPs completed
Preparation of Project Detailed Outline (PDO)		EA		Approval by Prime Minister
IEE and EMP completion	ADB review & approval on IEE/EMPs			ADB approved IEE/EMPs as per SPS (2009)
		EA reviews and endorse ADB's IEE/EMPs		EA endorsed IEE/EMPs with formal letter only. *Compliance with specific GOV /EA regulations is*

Design and Implementation	Environmental DD and Approvals			Milestones & Notes
	ADB/PPTA	Vietnam	LISC/Contractor	
				not required
Loan documents (PAM/RRP)	Document preparation, approval by ADB	Review & approval of PAM		Loan approval
Initiation of Viet Nam environmental DD		EA leads with oversight from DoNRE		Bac Giang PPC approved EIA report on September 28, 2015.
Detailed engineering design				
Continued stakeholder disclosure & consultation		IA/PMU lead	ES support to LISC	As per PCP (2012) stakeholder disclosure and consultations continue throughout construction phase coincident with initiation of GRM *Also satisfies consultation requirement of GOV.*
Update EMPs		Support to ES	Lead by ES	Endorsement of updated EMP by EA and ADB
Tendering /contract award				
uEMPs included in tender documents		Lead by EA/PMU	Support by ES	Standard tender documents with uEMP
Preparation of tenders' letter and bids prepared		Lead by EA	Contractor drafts CEMP	CEMPs prepared and included in contractor bids
Construction packages	Input from ADB		CEMPs reviewed by ES/LISC	Construction package awards
Construction & supervision				
Implementation of mitigation and monitoring plans		Support from IU/PMU	By contractor with support from ES	CEMP implemented by contractor, other aspects of EMP overseen by ES
Continued stakeholder disclosure and consultation		IA/PMU lead	Support from ES	As part of GRM
Monitoring report	To ADB	IA/PMU lead preparation of regular reports to ADB	Support from ES	Reports provide input for review missions

23. Bac Giang Department of Natural Resources and Environment (DoNRE) oversees the environmental management of Bac Giang province. Bac Giang DoNRE will work with officers of Bac Giang city to provide direction and support for environmental protection-related matters including application of the Law on Environmental Protection (2014) as implemented by Decree 18/2015/ND-CP, and Circular 27/2015/TT-BTNMT, and national environmental standards and criteria. The environmental standards and criteria for Viet Nam are listed in **Appendix B**. See updated IEE for complete legal and regulatory framework for environmental management in Viet Nam.

24. The ADB provides guidance to EA with any issues related to EMP, and reviews biannual reports on EMP activities compiled and submitted by EA which are disclosed on ADB website pursuant to ADB Safeguard Policy Statement (2009).

25. The Ministry, and counterpart provincial Department of Labour, Invalids and Social Assistance (DoLISA) prescribes regulations and guidelines governing worker and public safety in the workplace. The directives of M/DoLISA must be followed throughout the construction and operational phases of the subprojects. To supplement the M/DoLISA the IFC/World Bank Environment, Health, and Safety Guidelines (2007) should be adhered to.

III. SUMMARY OF POTENTIAL IMPACTS

26. The potential impacts of the construction and operation of the Bac Giang subproject components from the IEE which are summarized in Table 3 arise primarily from the civil works during the construction phase of the different subproject components. The short-term construction disturbances concern noise, dust, reduced access, increased traffic and risk of traffic accidents, worker and public safety, and local soil erosion & surface water sedimentation, and solid and liquid waste management. These short-term impacts can be managed and mitigated with Mitigation Plan provided below.

Table 2. Summary of potential impacts of Bac Giang subproject components

Phase	Activities	Potential impacts	Level of impacts	The affected
Pre-construction phase	- Land acquisition, compensation, support for affected households; - Site clearance; - Material collection, worker camp, worker gathering	Land acquisition and affected households: Component 1 will acquire 12932.6 m^2 and impact 825 households. - Trang Quang Khai road (5200 m^2), in which: + Residential land: 508,6 m^2 + Aquaculture land: 1,237.4 m^2 + Paddy field: 48,526.6 m^2 + The others (cemetery, traffic road...): 2,0957m^2 - North-Eastern ring road: + Residential land: 512,6 m^2 + Aquaculture land: 500 m^2 + Paddy field: 6,420 m^2 + The others (cemetery, traffic road...): 300 m^2 Activities of Component 3 will mainly dredge, widening and embankment to improve the existing stormwater system, so land acquisition for construction will be not required.	- Large and long-term. But can be controlled through RAP and mitigation measures. - Please see updated RAP of the Subproject for more details about compensation, support for affected households	- 825 households who have land and land-associated assets are affected
		Impacts caused by dust, noise from demolishing machines,	- Low, local and controllable through	- Vegetation in the project area - Air environment

Phase	Activities	Potential impacts	Level of impacts	The affected
		tree cutting tools for site clearance.	mitigation measures.. Estimation about number of trees to be cut down as follows: - Tran Quang Khai road: + Bamboo: 470 + Banana: 13 + Bead-tree: 13 + Eucalyptus: 13 - North-Eastern ring road: number of trees to be cut down is not considerable.	- Households living along or nearby the routes, lakes and canals to be improved: + The resettlement area of Ha Bac Fertilizer Plant + Dinh Ke cluster, Dinh Ke ward
	UXO removal	Injured worker or public	High, short-term and mitigatable: + Explosive remnants of Vietnam war (mostly unexploded bombs) could hide under the sediment or bottom soil layers of the ponds/canal/ Thuong river or rice-fields. They will endanger the field engineers, workers and machine operators or inhabitants if they are not cleared and defused completely before construction commencement.	- Military bomb squad - Workers at the construction sites - Inhabitants living around the construction sites
Construction phase	- Gathering of construction workers and machines and tools - Transportation of construction materials and residual soils, and sediment - Construction activities:	***Waste-related activities:*** - Dust from the excavation, ground leveling	- Low, short-term and mitigatable: + Dust from the excavation of the ponds and the canals is not significant because bottom sediment/soil is always moist or pasty.	- Vegetation in the project area - Air environment - Households living along or nearby the routes, lakes and canals to be improved: + The resettlement area of Ha Bac Fertilizer Plant + Dinh Ke cluster, Dinh Ke ward + Dam Thuan Huy and Tan Ninh clusters,

Phase	Activities	Potential impacts	Level of impacts	The affected
	+ Road construction: ground leveling; construction of road base, drainage system, sewer system, embankments and retaining walls, safety system + Construction of bridge over Thuong river + Improvement to storm water and wastewater system and environmental sanitation: dredge, embank and widen canals, lakes		+ Ground leveling for road construction could generate a volume of suspended particulates to the ambient air. However, most of construction sites is far from density residential areas, and dust release from these activities can be controlled by measures (water spray on dry/hot days, for example).	Tran Phu ward +Tien Mon, Tien Giang and Chau Xuyen clusters, Le Loi ward + An Phong hamlet, Tan Tien commune
		- Impacts caused by dust and emission gases from material, solid wastes, transportation vehicles	- Medium, short-term and mitigatable (only taken place in the construction phase) + Material and sediment/soil from excavation could be spilled or scattered from the uncovered trucks to the roads during transportation; additionally, due to hot and dry conditions, they will disperse as the fine dust into the air. However, this problem will only take place during construction phase and be controllable.	
		- Impacts from dust and gases emitted from construction machines and equipment	- Low, short-term and mitigatable (locally taken place in construction positions and only in construction phase)	
		- Wastewater from the construction period	- Low, short-term and mitigable (mainly the	- Locally affect the quality of the soil.

Phase	Activities	Potential impacts	Level of impacts	The affected
			water washing construction tools and devices, the water volume is local and few)	- Potential risks cause surface water pollution in Thuong river and ponds along Hoang Hoa Tham road (surrounding Minh Trung factory)
		- Solid wastes from the construction period	- Low, short-term and mitigatable): + Solid wastes mainly include excavated soil/sediment, sludge which normally are mephitic and could cause unpleasant odor for ambient air or sanitation issues. Adverse impacts will be mitigated through appropriate measures (transporting sludge, sediment to the dumping site right after excavation and using canvas sheets to cover body shells of the trucks…)	- Ambient air quality is affected
		- Waste oil and other hazardous waste from the maintenance of vehicles, construction machines, construction of bridges.	- Low, short-term and manageable (locally and infrequently)	- Locally soil pollution at the site - Potential risks cause surface water pollution in Thuong river and ponds along Hoang Hoa Tham road (surrounding Minh Trung factory) - Potentially cause soil pollution
		- Activities of workers: + Domestic wastewater + Domestic wastes	- Low, short-term and mitigable (locally taken place at the worker camp and during the construction phase)	- Potential risks cause surface water pollution in Thuong river - Potentially cause soil pollution - Affect air environment and generate epidemic diseases
		Waste-unrelated impacts: - Noise, vibration from construction machines and tools.	- Medium, short-term and mitigable (construction machines will only be placed within the ROW of the construction sites)	- Households living surrounding lakes, pump stations, at the starting point and the end of each route: + The resettlement area of Ha Bac Fertilizer Plant

Phase	Activities	Potential impacts	Level of impacts	The affected
				+ Dinh Ke cluster, Dinh Ke ward + Dam Thuan Huy and Tan Ninh clusters, Tran Phu ward +Tien Mon, Tien Giang and Chau Xuyen clusters in Le Loi ward + An Phong hamlet, Tan Tien commune
		- Disturbances to the local communities because of the concentration of workers at the site	- Low, short-term and mitigable (because of small and dispersed number of workers at the camp area in the course of construction of various packages and dispersed local people along the route)	
		- Impacts on the local traffic	- Medium, short-term and mitigable (local traffic could be affected due to operation of vehicles, narrow access to 5 lakes which could lead to increase traffic congestion or traffic accident risk. However, the impact could be controlled by sound construction methods).	- Household living at Dinh Ke cluster, Dinh Ke ward (the end of the North-East ring road) and Hau cluster, Tho Xuong war (the starting point of Tran Quang Khai road). - Household living surrounding Nha Dau, Soc Trang, Banh Keo, Dong Cua lakes - Vehicles moving on Xuong Giang and Hoang Hoa Tham roads, Thuong river dike road, -Vehicles passing the intersection between Le Loi road, National Road No. 31 and No. 37. - Barges, small ships or boats along Thuong river - Local roads of all residential areas in the subproject area
		- Impacts on agricultural production activities of households	- Low, short-term and mitigatable (taken place only in the construction period thanks to successive method).	- Households who have arable land along North-East ring road and Tran Quang Khai road - Households who have ponds for aquaculture along Hoang Hoa Tham road (at the end of Tran Quang Khai road)
		- Impacts on business activities	- Medium, short-term and mitigable (temporary block of houses and shops, taken place only in the construction period thanks to successive method).	- Some households living at Dinh Ke cluster, Dinh Ke ward and surrounding lakes to be improved.

Phase	Activities	Potential impacts	Level of impacts	The affected
		- Impacts on local infrastructures because of material transportation	- Low, short-term and mitigable (use 7-10 ton trucks to transport construction materials with not very long distance of transportation)	- Access roads to residential areas round the lakes - Dike routes along Thuong river
	- Construction activities - Daily activities of the local inhabitants	Public and Worker Health and Safety	Low, short-term and mitigatable: + Regulations on site-safety could be ignored or not complied strictly + Have not clear instructions to warn the people of danger caused by constructional activities	- Workers and field engineers - Inhabitants living near construction sites
		Odor and sanitation issues from sludge excavation activities of five lakes	Low, short-term and mitigatable (mentioned in section “Solid wastes from the construction period”)	
		Impacts on public utilities (including underground facilities)	Low, short-term and mitigatable: + Temporary loss or disruption of utilities and services such as water supply and electricity	- Local people living in the Sub-project areas
		Localized flooding due to temporary blockage of sewage systems and pumping stations	Low, short-term and mitigatable: + Sewage system will be temporarily blocked to set up new overflow chambers and construct wastewater systems	- - Household living surrounding Nha Dau, Soc Trang, Banh Keo, Dong Cua lakes (new wastewater collection systems around the lakes to be constructed) - residential areas where new overflow chambers will be constructed (Dong Cua, Huyen Quang, intersection between National Road No. 1A and Hung Vuong street, and Thanh Thien streets)

Phase	Activities	Potential impacts	Level of impacts	The affected
Operation phase	- Operation and maintenance of the routes	- Increase in noise and air pollution because of growing traffic;	- Medium, short-term and mitigatable (because of improved road, the traffic flow increases, leading to air and noise pollution)	-: Major impacts on residential areas along the routes
		- Increase in traffic accidents because of growing density and velocity of means of transportation	- Medium, short-term and mitigatable (traffic density and velocity is increased, leading to potential traffic accidents)	- Along the new urban roads, but it should pay much attention to positions where workers concentratedly live, bends in the road and intersections:
		- Impact on socio-economic conditions, migration	- Low, short-term and mitigatable (improvement of travelling condition may lead to uncontrolled development along the roads	- Impacts along the new urban roads and dense population area

A. Public Consultation

27. The stakeholder consultation program that was developed for Initial Environmental Examination (IEE) report and Environmental Management Plan (EMP) of the subproject will be performed in the phase of updating IEE report. Results from the consultation program will be added as a part of the updated IEE and EMPs.

Follow-up Consultation

28. As indicated by the IEE a concern of the public and stakeholders of the subproject were disturbances during construction of roads and improvement of storm water system, and the effect of road on increased traffic, and traffic accidents, temporary block of access roads, odor generation, social disturbance, water pollution etc…. These issues plus any others will be reviewed during follow-up consultations throughout the construction, and operation of the completed subproject components.

29. Bac Giang PMU shall be responsible for the public consultation during Component 1 and 3 implementations, but will be supported by LISC. Affected communities will be involved and consulted through site visits, investigations into sensitive areas, interviews and public consultation. Costs will be covered by the contractors and the LISC.

Table: Public Consultation Plan

Organizer	Format	Frequency	Subject	Attendees
Construction stage				
Contractor	Public meetings	Prior to start of construction works; quarterly thereafter	Presentation of planned activities and schedule; anticipated impacts and mitigation measures; grievance redress mechanism (GRM)	Potentially affected households, ward PC representatives
PMU, LISC	Public meetings & site visits and informal interviews	Once before construction commences (public meetings) and semi-annually thereafter during construction (site visits and informal interviews)	Presentation of planned activities and schedule; anticipated impacts and mitigation measures; GRM	Potentially affected households, ward PC representatives
PMU, LISC	Expert workshop	As needed, based on public consultation	Comments and suggestions on mitigation measures, public opinion	Experts of various sectors
LISC	Public opinion survey	Once at MTR stage	Public satisfaction with EMP implementation	Potentially affected households, ward PC representatives
Operation stage				
PMU, LISC	Public consultation and site visits	Once at the first year	Efficiency of impact mitigation measure during the operation stage, comments and suggestions	Potentially affected households and representatives of local authorities

Organizer	Format	Frequency	Subject	Attendees
LISC, PMU	Public satisfaction survey	Once at PCR stage	Public satisfaction with EMP implementation Comments and suggestions	Potentially affected households, ward PC representatives

IV. MITIGATION PLAN

30. The impact mitigation measures of the EMP are presented in a comprehensive mitigation plan for the subproject in Table 3. Similar to the IEE the mitigation plan is structured by the three development phases of the subproject defined by the pre-construction; construction; and post construction operational phase. The mitigation plan addresses the environmental issues and concerns raised at the stakeholder meetings.

Table 3. Environmental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Pre-Construction, Detailed Design Phase of Component 1 and 3 (Urban Roads, Storm Improvements)								
Confirmation of required resettlement, relocations, & compensation	No negative environmental impacts	1. Affected persons well informed well ahead of subproject implementation.	All affected persons in Component 1 and 3	Before project implemented	See updated resettlement plans	See updated resettlement plan	EA/IA/ PMU	Resettlement/compensation 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	No marginal cost[2]	PMU	PMU
GoV approvals	No negative imact	3. EIA report (in compliance with GoV's regulations) of Bac Giang subproject was approved in 2015. 4. Construction contractors prepare EMPs in line with GoV's regulations prior to construction.	Component 1 and 3	Before construction	As required	No marginal cost	PMU/ DoNRE	PMU/ Contractor

[2] No marginal cost indicates that costs to implement mitigation are to be built into cost estimates of bids of contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Update EMP	No adverse impact	5. Large cemetery at the starting point of Tran Quang Khai road was relocated 6. Identified measures that will ensure minimal to no erosion and sedimentation of Thuong river at Tran Quang Khai road bridge site 7. Confirmed DoNRE that no known rare or endangered species inhabit the subproject areas 8. Identified disposal locations of solid waste dumping site: Da Mai landfill located at Da Mai ward, 6 km far from the central of Bac Giang City. 9. Updated mitigation measures equivalent to potential impacts in the updated EMP. 10. Submitted updated EMP with new potential impacts to ADB to review. 11. Update baseline water quality of Thuong river at bridge site of Tran Quang Khai road and quality of water and sediments of ponds to be dredged (expected to be done in June 2017)	All sites including Thuong river, 5 lakes/ponds	Before construction initiated	Once with detailed designs documents		LISC	LISC/PMU
Confirm GoV approved construction waste disposal sites	No negative impact	12. Ensure Da Mai landfill, managed by BAC GIANG URBAN PROJECT MANAGEMENT JOINT STOCK COMPANY, will be approved to be used by subproject before starting construction of all Components. An agreement between PMU and the landfill management unit shall be secured before construction works start	Entire subproject	Before construction	As required	No marginal cost	PMU/DoNRE	PMU
UXO survey, & removal	Injured worker or public	13. Bac Giang PMU signed a contract No. 23/2016/HĐ.DA2.RPBM with Corporation 316 under Ministry of Defense to conduct UXO removal.	Beginning of subproject	Once	See Monitoring Plan below	PMU/PMU	GoV military	Beginning of subproject

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		14. Bac Giang PMU shall ensure that the contractor only starts the construction when all mines and UXO are cleared and the certificate of confirmation for safety site without UXO is issued.						
Develop bid documents	No negative environmental impact	15. Ensure updated EMP is included in contractor tender documents, and that tender documents specify requirements of EMP must be budgeted. 16. Specify in bid documents that contractor must have experience with implementing EMPs, or provide staff with the experience. 17. The Bid documents to include CEMP with separate plans for: (i) drainage of water from construction activities; (ii) soil erosion (iii) noise and dust control; (iv) waste treatment and sludge management; (v) liquid and solid waste treatment; (vi) traffic management; (vii) electricity supply; (viii) chance-find procedure for physical cultural resources; (ix) Odor and sanitation control, and (x) health and safety for worker and community.	Component 1 and 3	Before construction begins	Once for all tenders	No marginal cost	LISC	PMU
Create awareness of physical cultural resources in area	No negative environmental impact	18. PMU and LISC have reviewed and found no potential locations of physical cultural resources that will be effected by the sub-project's activities.	Component 1 and 3	Before construction begins	Once	No marginal cost	DCST	DCST
Obtain & activate permits and licenses	Prevent or minimize impacts	19. Prior to construction, Contractors to comply with all statutory requirements set out by GoV for use of construction equipment, and concrete batching (if any).	Component 1 and 3	Beginning of construction	Once	No marginal cost	LISC	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Capacity development	No negative environmental impact	20. PPMU Bac Giang has assigned a staff to oversee environmental management of entire subproject. The environmental staff shall be trained by LISC; 21. Develop and schedule training plan for PMU/SO/EO to be able to fully implement EMP, and to manage implementation of mitigation measures by contractors; 22. Create awareness and training plan for contractors (EO) who will implement mitigation measures.	Component 1 and 3	Before construction begins	Initially, refresher later if needed	No marginal cost	PMU	LISC
Recruitment of workers	Spread of sexually transmitted disease	23. Use local workers as much as possible thereby reducing of migrant worker. 24. Disseminate information on safety sexuality for local workers and non-resident workers	All work forces.	Throughout construction phase	Worker hiring stages	No marginal cost	EA/PMU	Contractors
Construction Phase of Component 1 and 3 (Urban Roads, Storm Improvements)								
Initiate EMP & sub-plans	Prevent or minimize impacts	25. In the pre-mobilization meeting with contractors and Bac Giang PMU and LISC, underscore the need for contractors to understand and adhere to uEMP, and to prepare site-specific construction EMP (CEMP). 26. Prepare and secure approval of CEMP including individual management sub-plans for different potential impact areas that are completed in pre-construction phase	For all construction sites of Component 1 and 3	Beginning of construction	Once	No marginal cost	LISC	PMU & Contractor
Training & capacity	Prevent of impacts through education	27. Contractor to commit and retain dedicated staff for project duration to oversee EMP and CEMP implementation 28. Implement training and awareness plan for PMU/SO/EO and contractors.	PMU office, construction sites	Beginning of civil work and through construction phase	After each event	No marginal cost	LISC	LISC/PMU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Worker camps	Pollution and social problems	29. Locate worker camps away from human settlements and water bodies. The camps of component 1 and 3 will be located in open spaces close to construction sites, away from intersection points with the local roads, business areas of local people. 30. Ensure adequate housing and waste disposal facilities including pit latrines and garbage cans. At worker camps, mobile toilets will be arranged to collect domestic wastewater. 31. A solid waste collection program must be established and implemented that maintains clean worker camps. 32. Locate separate pit latrines for male and female workers away from worker living and eating areas. 33. A clean-out or infill schedule for pit latrines must be established and implemented to ensure working latrines are available at all times. 34. Worker camps must have adequate drainage. 35. Local food should be provided to worker camps. Guns and weapons not allowed in camps. 36. Hazardous solid waste including waste oil, oily and greasy rag is collected into separate casks (each construction site/ workers camp is arranged 02 casks for storage) 37. Transient workers should not be allowed to interact with the local community. HIV Aids education should be given to workers. 38. Camp areas must be restored to original condition after construction completed.	All worker camps	Throughout construction phase	Monthly	No marginal cost	LISC/ PMU	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Implement Construction materials acquisition, transport, and storage sub-plan	Pollution, injury, increased construction traffic congestion	39. For Component 1 and 3, the Da Mai landfill located at Da Mai ward, 6 km far from the central of Bac Giang City has been selected to dispose the generated waste from construction activities. 40. Volume balance of excavated soil was calculated suitably. Volume of additional backfilled soil is limited at the lowest level. 1. Priority of using stone from licensed pits located in Ba Nang hamlet, Kai Kinh commune, Huu Lung district, Lang Son province. Also, sand source is taken from Ha hamlet, Song Mai commune, Bac Giang City, and soil is from Tram Hong quarry located in Noi Hoang commune, Yen Dung district, Bac Giang province. Soil for filling the road base is taken from the excavated volume, the shortage volume will be taken from the pit in Dau Trau mountain, Yen Lu and Nham Son communes, Yen Dung district. All sand, soil and stone quarries are being managed by the companies that are licensed by Bac Giang or Lang Son PPCs, and the permits are still valid (see section B. Detailed description of Component 1 and Component 3) 2. If the contractors use sand, soil and stone from other quarries, those quarries need to be certified by the local authorities and approved by PPMU prior to use. Pits and quarries should not be located near surface waters, houses, or cultural property or values and should have a fence perimeter with signage to keep public away 3. All topsoil and overburden removed should be stockpiled for later restoration.	All construction sites	Throughout construction phase	Monthly	No marginal cost	LISC/PMU	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		4. 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. 5. Unstable slope conditions in/adjacent to the quarry or pit caused by the extractions should be rectified with tree planting. 6. Trucks carrying construction material are covered. All trucks used should have well fitted bodies and not be overtopped in loading to avoid soil scattering. 7. Temporary storage areas on the site need to be away from water bodies and households; 8. Cover the material storage, setting up appropriate of mobilize material to the site to ensure that material will not obstruct at the site.						
DBST (pavement) production, and application	Air pollution, land and water contamination, and traffic & access problems	9. Piles of aggregates at sites should be used/or removed promptly, or covered and placed in non- traffic areas 10. Stored DBST materials 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. 11. Contractors must be well trained and experienced with the production, handling, and application of bitumen. 12. All spills should be cleaned immediately and handled as per hazardous waste management plan, and according to GoV regulations. 13. Bitumen should only be spread on designated road beds, not on other land, near or in any surface waters, or near any human activities.	Component 1 (urban road construction)	Throughout construction phase	Monthly	No marginal cost	LISC & PMU	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		14. Bitumen should not be used as a fuel						
Implement Spoil management sub- plan	Contamination of land and surface waters from excavated spoil, and construction waste	15. Uncontaminated soil and stone is transported and disposed at landfill sites (Da Mai landfill) 16. 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. Excavated soil which should be reused at other construction locations need to be added (if any). 17. A record of type, estimated volume, and source of disposed spoil must be recorded. 18. Suspected contaminated soil must be tested, and disposed of in designated sites identified as per Decision No.38/2015/NĐ-CP and Circular No.36/2015/TT-BTNMT. Before treatment or disposal contaminated spoil must be covered with plastic and isolated from all human activity.	All construction sites	Throughout construction phase	Monthly	See Monitoring Plan for contaminated soil analyses	LISC & PMU &DoNRE	Contractor
Implement solid and liquid construction waste sub-plan	Contamination of land and surface waters from construction waste	19. Areas of disposal of solid and liquid waste to be mentioned in contents of CEMP. 20. Provide adequate garbage bins at the construction sites. 21. The placement of washing instruments/vehicles next to the water body will not be allowed to avoid the leaching of waste, sludge, soil and oil contaminated water and maintenance activities will be banned on the sites, 22. Disposal of solid wastes into canals, stream, other watercourses, agricultural fields and public areas shall be prohibited; 23. Burning of construction and domestic wastes shall be prohibited	All construction sites and worker camps	Throughout construction phase	Monthly	No marginal cost	LISC & PMU &DoNRE	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		24. A schedule of solid and liquid waste pickup and disposal must be established and followed that ensures construction sites are as clean as possible. 25. Solid waste should be separated and recyclables sold to buyers in community. 26. Sediment, sludge and soil excavation activities must be scheduled to avoid rainy to reduce suspended maters in runoff water entering the surrounding water bodies. Sediment, sludge from excavation must be taken to the landfill as soon as possible to protect surrounding water bodies from suspended maters in runoff water 27. Bentonite slurry, bentonite sludge, mud and other materials and wastes from drilling will be collected and processed to avoid pollution of surface water. Discharge of such materials into watercourses shall be prohibited. 28. Drilling solutions (e.g., bentonite slurry) for bridge construction, abutment construction, piling, etc. will be processed in a closed system, especially for abutments and foundations at the riverbed 29. Proper disposal of bentonite containing spoils as fill material in appropriate sites shall occur 30. Spillage of bentonite mud in agricultural land shall be cleaned immediately to prevent caking and hardening ***Hazardous Waste*** 31. Collection, storage, transport, and disposal of hazardous waste such as used oils, gasoline, paint, and other toxics must follow Circular no 36/2015/TT-BTNMT on management of hazardous waste.						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		32. Wastes should be separated (e.g., hydrocarbons, batteries, paints, organic solvents) 33. 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. 34. All spills must be cleaned up completely with all contaminated soil removed and handled with by contaminated spoil sub-plan. 35. Maintain daily records on use of hazardous substance and waste generation						
Implement Noise and dust sub-plan	Dust Noise	36. On hot and dry days, regularly watering on the transportation routes and on the construction site 2 times per day to reduce dust especially the populated areas. 37. Cover or keep moist all stockpiles of construction aggregates, and all truckloads of aggregates. 38. Minimize time that excavations and exposed soil are left open/exposed. Backfill immediately after work completed. 39. As much as possible restrict working time between 17:00 and 7:00. In particular are activities such as pile driving. 40. Maintain equipment in proper working order 41. Replace unnecessarily noisy vehicles and machinery. 42. Vehicles and machinery to be turned off when not in use. 43. Construct temporary noise barriers around excessively noisy activity areas where	All construction sites	Fulltime	Monthly	No marginal cost	LISC & PMU	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		noise and dust levels at construction site boundary exceed the national standard.						
Implement Utility and power disruption sub-plan	Loss or disruption of utilities and services such as water supply and electricity	44. Develop carefully a plan of days and locations where outages in utilities and services will occur, or are expected. 45. Obtain the agreement with local authorities in using the transport routes and other public facilities; 46. Contact local utilities and services with schedule, and identify possible contingency back-up plans for outages. 47. Record the status of the existing roads and facilities before construction and make proper compensation for damages if any. 48. Contact affected community to inform them of planned outages. 49. Try to schedule all outages during low use time such between 24:00 and 06:00. 50. All public facilities shall be fully re-established to pre-construction status after completion of construction works	All construction sites.	Fulltime	Monthly	No marginal cost	LISC & PMU&Utility company	Contractor
Implement Tree and vegetation removal, and site restoration sub-plan	Most of trees to be removed are not ecological value (shrubs, trees, timbers)	51. Only removal of trees within site clearance scope. Restrict tree and vegetation removal 52. Prevent tree removals, and install protective physical barriers around trees that do not need to be removed. 53. All areas to be re-vegetated and landscaped after construction completed	All construction sites.	Beginning and end of subproject	Monthly	No marginal cost	LISC & PMU	Contractor
Implement erosion control sub-plan	Land erosion	54. Berms, and plastic sheet fencing should be placed around all excavations and earthwork areas. 55. Earthworks should be conducted during dry periods.	All construction sites	Throughout construction phase	Monthly	No marginal cost	LISC& PMU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		56. Maintain a stockpile of topsoil for immediate site restoration following backfilling. 57. Protect exposed or cut slopes with planted vegetation, and have a slope stabilization protocol ready. 58. Re-vegetate all soil exposure areas immediately after work completed.						
Implement worker and public safety sub-plan	Public and worker injury, and health	59. Proper fencing, protective barriers should be provided around all construction sites. 60. Sufficient signage and information disclosure, and site supervisors and night guards should be placed at all sites. 61. Worker and public safety guidelines GoV should be followed (DoLISA regulations & guidelines). 62. Speed limits suitable for the size and type of construction vehicles, and current traffic patterns should be developed, posted, and enforced on all roads used by construction vehicles. 63. Standing water suitable for disease vector breeding should be filled in. Vertical and longitudinal drainage culverts will be designed to drainage for the road 64. Worker education and awareness seminars for construction hazards should be given at beginning of construction phase, and at ideal frequency of monthly. A construction site safety program should be developed and distributed to workers. 65. Appropriate personal protective equipment shall be equipped for all construction workers. 66. Adequate medical services must be on site or nearby all construction sites. 67. Drinking water must be provided at all construction sites.	All construction sites.	Fulltime	Monthly	No marginal cost	LISC & PMU	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		68. Sufficient lighting is used during necessary night work. 69. All construction sites should be examined daily to ensure unsafe conditions are removed. 70. Report any construction accident or near miss to the PMU, LISC within 24h. Report serious accidents involving hospitalization or death of workers or residents to DOLISA and ADB within 24h						
Civil works	Degradation of water quality & aquatic resources	71. Protective coffer dams, berms, plastic sheet fencing, or silt curtains should be placed between all earthworks and Thuong river and other surface waters. 72. Erosion channels must be built around aggregate stockpile areas to contain rain-induced erosion. 73. Earthworks should be conducted during dry periods. 74. All construction fluids such as oils, and fuels should be stored and handled well away from Thuong river and other surface waters 75. No waste of any kind is to be thrown Thuong river and other surface waters 76. No washing or repair of machinery near surface waters. 77. Pit latrines to be located well away from Thuong river and other surface waters 78. No unnecessary earthworks in or adjacent to water courses. 79. All irrigation canals and channels to be protected the same way as Thuong river	All construction sites	Throughout construction phase	Monthly	No marginal cost	LISC& PMU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Civil works	Potential risk on water surface contamination at Thuong river and ponds along Hoang Hoa Tham road.	80. Earthworks should be conducted during dry periods. 81. All construction fluids such as oils, and fuels should be stored and handled well away from Thuong river and ponds as well. 82. No waste of any kind is to be thrown into Thuong river and ponds or surface waters. 83. No washing or repair of machinery near surface waters.	All construction sites	Throughout construction phase	Monthly	No marginal cost	LISC & PMU	Contractor
Implement Construction and urban traffic sub-plan	Traffic disruption, accidents, public injury	84. Schedule construction vehicle activity during light traffic periods. Create adequate traffic detours, and sufficient signage & warning lights. 85. Post speed limits, and create dedicated construction vehicle roads or lanes. 86. Inform community of location of construction traffic areas, and provide them with directions on how to best co-exist with construction vehicles on their roads. 87. Demarcate additional locations where pedestrians can develop road crossings away from construction areas. 88. Provide construction road and walkway lighting.	All construction sites	Fulltime	Monthly	No marginal cost	LISC & PMU	Contractor
Implement Construction Drainage sub-plan	Local flood in construction areas	89. Provide adequate short-term drainage away from construction sites to prevent ponding and flooding. 90. Install temporary storm drains or ditches for construction sites 91. Frequently clear the flow at the construction site to limit blockage capacity. 92. Clean construction material at the site, cover materials that are easily dissipated by the wind in so that they are not swept away with the water flow, causing water flow block and flooding at the site	Construction site of bridge over Thuong river	Design & construction phases	Monthly	No marginal cost	LISC & PMU	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Civil works & Chance finds subplan	Damage to cultural property or values, and chance finds	93. As per detailed designs all civil works should be located away from all cultural property and values. EA identified potential sites and types of PCR in pre-con phase. 94. Chance finds of valued relics and cultural values should be anticipated by contractors. Site supervisors should be on the watch for finds. 95. Upon a chance find all work stops immediately, find left untouched, and PMU notified to determine if find is valuable. Culture section of DCST notified by 96. Work at find site will remain stopped until DCST allows work to continue.	All construction sites	At the start, and throughout construction phase	Monthly	No marginal cost	LISC& PMU	Contractor
Construction alignment for road	Destruction or damage to extensive home gardens along alignment	97. Extra care to locate road alignment to avoid or minimize destruction or damage of dense home garden plots in road area.	North-Eastern ring road' construction site	Through construction phase	Monthly	No marginal cost	PMU/LISC	contractor
	Damage to irrigation network along alignment	98. Any damage to existing irrigation canal network must be avoided, or repaired or replaced if damage unavoidable						
Construction of new bridge for western road	Sedimentation of Thuong river near new bridge site	99. Temporary earthen berms, or plastic fencing need to be installed along both riverbanks to isolate river from erosion caused by earthworks for bridge construction	Construction site of bridge over Thuong river	During all earthworks activities	Monthly	No marginal cost	PMU/LISC	contractor
	Damage aquatic habitat in Thuong river	100. Bridge support piles should be place on the riverbanks not in the river		When foundation of bridge constructed				

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Isolation of pond perimeters from adjacent houses	Acute disturbance of property including flooding	101. The work area along the houses around the ponds must be isolated from the exterior walls of the houses to prevent encroachment into household activities. Rubber dams should be installed along external house walls to prevent pond water from entering houses	At external walls of all houses facing stormwater ponds	Throughout construction period	Monthly	No marginal cost	PMU/LISC	contractor
Operation of urban roads								
Operation of Tran Quang Khai and North-Eastern ring roads	Increase the risks of traffic accidents due to increased numbers of vehicles on the new road	102. Arrangement of warning signs, instruction signs at intersection locations. 103. Limit speed when crossing residential sites. 104. Arrangement of transport staff for regular investigation of the roads for exceeding-permitted speed cases and non-compliance cases of traffic regulations	Along the urban roads	Full time	Annually	O&M	Bac Giang DoT	
	Dust, emission, noise of traffic vehicles on the road	105. Sufficient annual O&M budget must be provided to ensure all equipment stays in good working condition. 106. Regular sanitation on the route 107. Planting trees along 02 the routes and median strips.	Along the urban roads	Full time	Annually	O&M	Bac Giang DoNRE	
Operation of pump stations and improved ponds	Noise from storm water pump and bar screen machine	108. Set up noise elimination and sound absorption facilities for the major noise sources; install separate base and rubber gasket for machine 109. Adopt the design of closed window in ensuring the enough ventilation and heat dissipation of Pumping house, and install muffler at ventilation opening if necessary	Pump stations	Rainy season	Annually	O&M	Bac Giang Water Supply and Sewerage Co, Ltd	
	Deterioration of pond water quality caused by solid waste	110. Regularly collect solid wastes floating on the surface of the ponds 111. Set up bins and sign boards surrounding the ponds to collect garbage and to prevent people from dropping litter into the ponds.	Ponds	Full time	Annually	O&M	Bac Giang Water Supply and Sewerage Co, Ltd	

V. MONITORING PLAN

31. The environmental monitoring plan for the EMP is provided in Table 4. The monitoring plan focuses on three phases (pre-construction, construction, post-construction operation) of the subproject and consists of environmental indicators, 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 unexpected positive or negative environmental impacts of the Component 1 and 3.

A. Environmental Quality Standards and Impact Monitoring for Component 1 and 3

32. Standards and Regulations on environmental quality in Vietnam are listed in Appendix B. Environmental standards provided in accordance with IFC/WB Environment, Health, and Safety Guidelines (2007) should be adhered to for ambient noise, as these are more stringent than regulations of the Government of Vietnam.

33. LISC shall be responsible for implementation of environmental impacts monitoring under the monitoring plan. For these objectives, LISC may decide to contract an Independent Environmental Monitoring Consultant (EMC) under the supervision and coordination of the LISC and the PMU. Either LISC or LISC's EMC is charge of the sampling of environmental parameters to be analyzed in the labs.

34. After completing the work and the urban roads are put into operation, air quality will be frequently checked by the operation unit or by DoNRE. Monitoring of the success of any minor compensation will be undertaken part of the RP which is separately prepared for the subproject. Table 4 summarizes monitoring responsibilities during the construction and implementation of the subproject.

1. Performance Monitoring

35. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the LISC (coordination with Bac Giang PPMU) for the entire subproject. Selected indicators of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 5.

2. Reporting

36. Regular reporting on the implementation of mitigation measures, and monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of Bac Giang PMU, and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. Table 5 – Lists environmental monitoring reporting requirements, responsibilities and timing. Appendix C provides a monitoring report template for the PMU that the PMU with assistance from and the LISC must complete and attach as part of a consolidated project-level integrated safeguards monitoring report to ADB.

37. A report on environmental monitoring and implementation of EMP for the subproject component sites will be prepared semi-annually for the EA/PSC by the PMU. The PMU report will compile monthly reports provided by the EO of contractor, the reports of the LISC/EMC on effect monitoring, and input from the ES of the LISC. The PMU report will also be sent to the DoNRE. Bac Giang PMU will consolidate the reports from PPMUs of Lao Cai and Mong Cai to be semiannual report which will be submitted to ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators, and will reference relevant GoV environmental quality standards.

The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 5), and will reference relevant GoV environmental quality standards.

Table 4. Environmental Reporting Plan

Environmental indicators	Location[3]	Means of monitoring	Frequency	Reporting	Responsibility		Estimated cost (USD)
					Supervision	Implementation	
Pre-construction Phase – Update Environmental Baseline Conditions							
Update status of air quality: Total suspended particles (TSP), CO, SO2, NO2 noise, vibration (8 locations)	Eight (08) locations for ambient air, noise and vibration tests: - Residential areas surrounding the ponds (3 samples) including Nha Dau, Soc Trang, Banh Keo - The starting point of Tran Quang Khai road (Hau cluster, Tho Xuong ward) - The end of Tran Quang Khai road (Phu Gia hamlet, Song Mai commune) - The end of North-Eastern ring road (Dinh Ke cluster, Dinh Ke ward) - The gate of Methadone-Treatment Center (under Bac Giang Center for HIV/AIDS Prevention) - Residential area near by the starting point of North-Eastern ring road (Xuong Giang ward)	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV	Once before construction	One report supplemented before construction	PMU	LISC/ EMC	$903
Update current quality of surface water (pH, DO, BOD5, COD, TSS, ammonium, nitrite, nitrate, sulfate, phosphate, total nitrogen, total phosphorus,, oil and greases, Total Coliform)	Five surface water samples: - Surface water of Thuong River (3 samples) including; + Bridge construction site + Bridge construction site + 500 (upstream) + Bridge construction site – 500 m (downstream) - Surface water of 2 ponds nearby the end of Tran Quang Khai road (two samples)	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Once before construction	One report supplemented before construction	PMU	LISC/ EMC	$3,005
Update ground water quality (pH, DO, COD-KMnO4, ammonium, nitrite, nitrate, ,sulfate, phosphate, total nitrogen, total phosphorus, Total Coliform)	- Groundwater (3 samples) in residential area near by construction areas: + Tan Ninh street, Tran Phu ward + Dong Giang Cluster, Xuong Giang ward + Dong Cua cluster, Chau Xuyen street, Le Loi ward	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Once before construction	One report supplemented before construction	PMU	LISC/ EMC	$893

[3] Monitoring locations can be changed during the construction phase, depending on the actual conditions and construction process.

Environmental indicators	Location[3]	Means of monitoring	Frequency	Reporting	Responsibility		Estimated cost (USD)
					Supervision	Implementation	
Update quality of sediment (arsenic, lead, cadmium, mercury, copper, zinc) to study whether or not heavy metals have accumulated on bottom sediments over many years	- Sediment of the ponds including: + Soc Trang + Nha Dau + Banh Keo	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Once before construction	One report supplemented before construction	PMU	LISC/ EMC	$733
Construction Phase of Component 1 and 3							
Quarterly monitor air quality: air environment: Total suspended particles (TSP), CO, SO2, NO2, noise, vibration.	Four air samples including: - Thuong River Garden Home near by Banh Keo pond - The starting point of Tran Quang Khai road (Hau cluster, Tho Xuong ward) - The gate of Methadone-Treatment Center (under Bac Giang Center for HIV/AIDS Prevention)	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Quarterly	Quarterly	PMU	LISC/ EMC	$4,064
Quarterly monitor surface water environment: (pH, DO, BOD5 (20°C), COD, TSS, ammonium, nitrite, nitrate, sulfate, phosphate, total nitrogen, total phosphorus, total oil and greases, Total Coliform)	- Surface water in Thuong River (3 samples) including; + Bridge construction site + Bridge construction site + 500 (upstream) + Bridge construction site – 500 m (downstream) + Surface water of a pond nearby the end of Tran Quang Khai road	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Quarterly	Quarterly	PMU	LISC/ EMC	$28,849
Quarterly quality of soil environment (Parameters will depend on pollution source)	Locations contaminated by significant amount of liquid hazardous waste (through visual checks or reports on incident)	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Quarterly	Quarterly	PMU	LISC/ EMC	$4,840
Construction waste and domestic waste (of worker) in and outside the site, including worker camps	All construction sites and worker camps	Observation	Monthly	Monthly	PMU	LISC/ EMC	No marginal cost
Comments and Complaints of local people	Use hot line number at the construction site; PMU GRM	Information will be provided through hotline at construction site, GRM register	During construction period	Monthly	PMU	Contractors, PMU	$2,000
Accidents of workers or accidents/injuries of local people	All construction site	Regular reports of Contractor/PMU	During construction period	Monthly	PMU	Contractor	No marginal cost
Operation of urban roads, pump station							

Environmental indicators	Location[3]	Means of monitoring	Frequency	Reporting	Responsibility		Estimated cost (USD)
					Supervision	Implementation	
Incidence of road accidents	Along Tran Quang Khai and North-Eastern ring road	Regular reporting of police	Annually	Annually	PPC/DOT		included in annual operation cost of Bac Giang DOT
Air quality and noise	Along Tran Quang Khai and North-Eastern ring road, at sensitive receptors : - The starting point of Tran Quang Khai road (Hau cluster, Tho Xuong ward) - The end of Tran Quang Khai road (Phu Gia hamlet, Song Mai commune) - The end of North-Eastern ring road (Dinh Ke cluster, Dinh Ke ward) - The gate of Methadone-Treatment Center (under Bac Giang Center for HIV/AIDS Prevention) - Residential area near by the starting point of North-Eastern ring road (Xuong Giang ward)	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Annually	Annually	DONRE		included in annual operation cost of Bac Giang DOT
Surface water quality	All improved and dredged ponds	Use methods of monitoring, sampling collection and analysis in accordance with current standard and regulations of the GoV.	Annually	Annually	DONRE		included in annual operation cost of Bac Giang DONRE

Fig. 13. Sampling points for updating EMP (S-Sediment, A-Air, G-Groundwater, W-Surface water)

Table 5. Performance Monitoring Indicators for 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) Contractor's Environment Management Plan)	EMP appended to bidding documents with clear instructions to bidders for CEMP	Bid documents
Training of PMU	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
Ambient air quality	Total suspended particles (TSP), CO, SO2, NO2, noise, vibration	Record basic conditions under the monitoring plan	Sampling
Quality of surface water of Thuong river	pH, DO, BOD5 (20°C), COD, TSS, ammonium, nitrite, nitrate, oil and greases, Total Coliform)	Record basic conditions under the monitoring plan	Sampling
Quality of sediment from the lakes: + Dong Cua + Nha Dau + Banh Keo	arsenic, lead, cadmium, mercury, copper, zinc	Record basic conditions under the monitoring plan	Sampling
	Construction Phase		
Thuong river quality	pH, DO, BOD5 (20°C), COD, TSS, ammonium, nitrite, nitrate, oil and greases, total oil and greases, Total Coliform	Levels never exceed preconstruction baseline levels and comply with relevant Vietnamese standard	Monitoring by EMC
Air quality (residential areas near construction sites)	Total suspended particles (TSP), CO, SO2, NO2, noise, vibration.	Levels never exceed preconstruction baseline levels and comply with relevant Vietnamese standard	EMC & contractor monitoring reports,
Soil quality (locations contaminated by liquid hazardous waste)	Parameters will depend on pollution source	Rigorous program of procedures & rules to collect and store all waste from construction camps and sites	Contractor and EMC monitoring reports
Hazardous materials & waste	Oil, gasoline, grease ...etc. (depend on waste sources)	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 OHS regulations/policy to prevent	Contractor reports

Major Environmental Component	Key Indicator	Performance Objective	Data Source
		accidents[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
Traffic	Frequency of disruptions & blocked roadways	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
Operation of Stormwater Ponds, pump stations			
Aesthetics, solid waste	Odor, uncontained garbage	Clean pond areas, no aesthetic issues	Public/PPC
Surface water quality	pH, DO, COD, BOD5, TSS, ammonium, nitrite, total oil and greases, total Coliforms.	Levels never exceed allowable limits regulated in Vietnamese regulation on surface water quality	Public/DoNRE,
Operation of New Urban Roads			
Risk of accidents, noise, dust	Incidence of accidents, and dust & noise levels	Levels never exceed allowable limits regulated in Vietnamese regulation on ambient air and noise	DOT/PPC

VI. ESTIMATED COST OF EMP

38. 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. The preliminary costs for the implementation of the EMP for the subproject are summarized in Table 6. These costs include per diem technician fees.

39. An estimated budget of USD $10,000.00 is required for capacity building and training for environmental management in conjunction with other capacity development activities of the project such as occurring as part of overall the capacity development component of the PPTA. The costs to implement the EMP will need to be updated by the LISC in conjunction with the PMU during the pre-construction phase

Table 6. Estimated Costs for Environmental Monitoring Plan of EMPs for Component 1 and 3 during pre-construction and construction phases

Activity Type	Estimate cost (USD)
Pre-construction Phase	
Public consultation	$550
Update ambient air quality	$903
Update surface water quality	$3,005
Update sediment quality	$733
Update groundwater quality	$893
Construction phase	
Air quality	$4,064

[4] MoLISA GoV Regulations and Policy

Activity Type	Estimate cost (USD)
Surface water quality	$28,849
Soil quality	$4,840
Comments and complaints of local people	$500
Public consultation	$2,000
Operation phase	
Environmental quality	Included in cost for annual monitoring of environmental quality of Bac Giang province
Community participation	No marginal cost
Traffic safety monitoring	included in operation cost of Bac Giang DOT

Notes: Monitoring costs included in the cost stated in the contract with EMC

VII. EMERGENCY RESPONSE PLAN

40. 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 fire and police departments, emergency medical service, the Department of Health (DPH), collectively referred to as the External Emergency Response Team (EERT), as ultimate responders.

41. 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 Responses

Entity	Responsibilities
Contractor Team (Emergency Response Team (ERT))	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)	Solves the emergency/incidents
Contractor Resources	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.

42. The Contractor's Senior Engineer directs emergency response team (appointed by emergency response team leader). First aid staff is trained and security groups are key members of the Emergency Response Team.

43. Contractor ensures that members of Emergency Response Team should meet the physical, technical and psychological requirements to take on the role and responsibility for emergency response.

44. Prior to the construction works mobilization, the Contractor, through Construction Management, the head of the emergency response team, in coordination with the Project Implementation Unit, will meet with the final response organizations to discuss about the overall construction process, including but not limited to:
    (i) The subproject area;
    (ii) Time frame and construction phase;
    (iii) Any special techniques and equipment to be used; Any toxic substance that will be brought to and stored at the construction facility and the details of the application and treatment / management system;
    (iv) Contractor's Emergency Management Plan;
    (v) Name and contact information of Emergency Response Team members

45. Objectives of meetings aim to provide the final response agencies with context in order to:
    (i) Assessment of the relevance of the associated emergency management plan
    (ii) Evaluation of the type, level and incidence of estimated potential risks
    (iii) Organization of coordination and cooperation.

46. In order to ensure an effective emergency response, prior to construction work mobilization, the Contractor shall:
    (i) Establish an emergency response team;
    (ii) Set up support equipment and system in working conditions
    (iii) Arrange with the external emergency response team;
    (iv) Provide appropriate training for emergency response team members, and encourage and train volunteers from the workforce;
    (v) Provide guidance to all construction workers on emergency procedures and systems, especially evacuation procedures, escape routes, evacuation points, and self- initial response and other issues; and
    (vi) Perform practice for different situations that may occur.

47. To maintain effective emergency response during the Subproject implementation, there should provide aquadate budget to maintain capacity and efficiency of emergency response mechanism, equipment, instruments, vehicles and materials for emergency response. Regular use at least every 2 months and remind at least once a month.

A. Warning Process

48. The mode of communication, reporting and warning of an emergency situation may be associated with: an audible alarm (siren alarm, bell or gong); ii) visual alarm (strobe light / red light or orange safety flag); iii) telephone (fixed line telephone); iv) mobile phones; v) two-way portable radios; and vi) public broadcasting / loudspeaker systems. Some rules related to communication / alarm include:

    (i) Those who first find out the emergency immediately need:
        + Call the attention of others at the incident scene,
        + The nearest sound alarm, and / or
        + Report / contact with Emergency Response Team on emergency situation.
    (ii) Only the emergency response team leader, if the team leader is not present at that case, and emergency response team deputy leader is authorized to contact with the external emergency response team. Exceptions cases to this rule and should be identified in the Incident Management Plan.
    (iii) When contacting / reporting an incident to the external Emergency Response Team, there should provide at least: i) the type of emergency; Place of occurrence; (ii) the estimated size of the emergency; iii) individuals expected to be affected; iv) time of occurrence; v) in the event of hazardous substance overflow; and vi) in case of fire and explosion. Details will help the team leader prepare appropriate response plans.

49. For effective reporting / warning on emergencies:
    (i) The name and contact information of the persons and organizations involved should be available or nearby, all types of communications equipment, and posted strategically (with size toeasily read) in all areas and facilities of the subproject:
        + All related construction / operation officers, emergency response team leader, team deputy leader, first aid workers, supervisor engineer and construction site monitoring
        + Organization of external emergency response team
        + Departments of related villages
        + Staff of the project implementation unit, safety officer
    (ii) All project areas should have good access systems with sound and visual alarming system, landlines, mobile phones and 2-way radios all the time.
    (iii) Contractor's vehicles should be equipped with suitable communication systems.

B. Emergency Response Situations

50. The following tables recommend common procedures that are screened in the final Environmental Management Plan during the detailed design process and are described in more detail in the Contractor's Emergency Incident Management Plan.

Table 8. Evacuation procedures

Procedures	Note
Relocation as each group as quickly as possible and avoid panic	All staff / workers, subcontractors, field supervisors, when going out, should follow the directions of the emergency response team.
Evacuation according to instructional exits	Safe evacuation is decided by emergency response team leader / team deputy leader and should be promptly notified to team members.
Continue relocation until everyone is safe from the place of the incident and affected area	Establish the restricted area outside the incident area; everyone must be away from the restricted area.
In case outside, take attendance	The foreman needs to take attendance small groups, the head / deputy head of the incident response team.
Report the absentee immediately to the External Response Team	The head / deputy head is in contact with the external incident response team
Support the injured during the evacuation process and help them with first aid or medical team for external emergency response	The incident response team manages the injured to ensure properly handle
If the injured need special care, DO NOT move them if it is not necessary and without the guidance of the external Response Team.	The team leader / deputy leader contacted the external incident response team for guidance to deal with the injured.

Table 9. Procedures for Responding to Emergency Medical Incidents

Procedures	Note
There should provide immediate first aid regardless of severity.	Basic principles for first aid: + Ensure first safety for both rescuers and victims. + Do not move the injured unless the victim is exposed to more dangers by leaving them alone, for example, in the event of a fire or chemical spill.

Procedures	Note
	+ The external incident response team cannot assist the victim in the event of works collapse. + Follow the directions of the incident response team + First Aid is performed by staff trained in first aid
Call the emergency medical service and / or nearest hospital	Incident response team leader / deputy team leader or in-place incident contact officers are authorized
Facilitate the external response team leader to direct at the incident site.	Team leader/ deputy leader should give guidance: + On-site incident response team members should meet with the team leader to access the strategic road / location. + Arrange orange safety flags to attract attention and direct them in place. + The members of the incident response team need to know the access road to ensure safe traveling for the Team.
Immediate evocation at incident places and affected areas, restricted area, stop construction until announcement	Follow first aid procedure.

Table 10. Process of responding in case of fire

Procedures	Note
Warning of fire and explosion	Explosion detector needs timely: Get people's attention at location of fire and explosion Alarm by sounds at the nearest location, and / or Supervisors or any member of the Incident Response Team, among the small groups, contact with the fire prevention department (in this case, it should be agreed that any member of the Response Team in small group to alert the fire prevention department) Report/ contact emergency for Team Leader / Deputy leader of Incident Response Team.
Stop activities and evacuate	All workers / staff (not belong to incident response team), subcontractors, site and community supervisors remove to safe place following the evacuation process.
Alarm Response Team for firefighting / fire spread controlling.	According to the training, ERT members are assigned to firefighters will evaluate their own safety situation before attempting to control the fire spreading.
Call the nearest fire station & police station, and emergency medical services	In case alerting, the external incident response team, the team leader should report the location, cause of fire, level of estimated fire warning, any case of injury.
Facilitate directing the external incident response team at the incident site.	Team Leader / Team Deputy Leader should lead: Team members meet the external incident response team at the entrance road or strategic location and lead them to the incident area. The orange safety flag should be raised to attract attention and guide them into the area of the incident. Some team members need to stop transport, and know the access road to facilitate traveling for the External Response Team.
The incident response team	Comply with appropriate evacuation procedures

Procedures	Note
should evacuate the incident area as soon as possible to ensure safety	

VIII. EVALUATION ON CAPACITY, INSITUTION AND DEMANDS

51. At present, there is insufficient experience and capacity for environmental assessment and management among national partners taking responsible for implementation of the EMP, e.g. PPC/PMU in Bac Giang. With the support of the designated SO/PMU, LISC will develop and train the PMU staff responsible for implementing the subproject. The purpose of the course is to enhance the capacity of PMU / SO to monitor the EMP implementation by construction contractors and Environmental Monitoring Consultants (EMC).

52. Safety Officer (SO) is a permanent environmental member of the PMU and Environmental Officer (EO) of the contractor who needs to attend the training course. Training costs are included in the cost of implementing the EMP.

53. Training of EMP implementation will address two thematic fields. The first field is the principles of environmental management, attaching importance to the potential impact of subproject activities on the natural and social environment. The last one is the ADB and the Government's environmental safety requirements with specific reference to the EMP.

APPENDIX B: NATIONAL TECHNICAL REGULATIONS

❖ Water quality

- QCVN 01:2009/BYT - National technical standards on drinking water quality.
- QCVN 08-MT:2015/BTNMT - National technical standards on water surface quality.
- QCVN 09-MT:2015/BTNMT - National technical standards on underground water quality.
- QCVN 14:2008/BTNMT -National technical standards on domestic waste water quality
- QCVN 02:2009/BYT - National technical standards on domestic water supply

❖ Air quality:

- QCVN 05:2013/BTNMT- Air quality - National technical regulation on ambient air quality;
- QCVN 06:2009/BTNMT - Air quality - Maximum allowable concentration of toxic substances presented in ambient air;
- National standard TCVN 6438:2005 on Land-road means of transport- Maximum allowable limit of the emission

❖ Solid waste management

- TCVN 6696:2009 – Solid waste - Hygienic landfill - General requirements on environmental protection.
- QCVN 07:2009/BTNMT - National standard for hazardous waste thresholds.
- QCVN 25:2009/BTNMT –National technical regulation on wastewater of solid waste landfill
- QCVN 15:2008/BTNMT –Soil quality - National standard on pesticide in soil
- QCVN 03-MT:2015/BTNMT –Soil quality - National standard on the permissible limit of some heavy metals in soil.

❖ Vibration and Noise:

- QCVN 26:2010/BTNMT: National technical standards on noise
- QCVN 27:2010/BTNMT-National technical standards on vibration
- TCVN 6962:2001 on vibration- concussioncaused by construction and industrial production activities - the maximum allowed for environment in public and residential areas

❖ International standards applicable to the Components

- The World Bank group, 2007. Guidance on environment, health and safety, Wash. DC. The noise standard of the EHS Guidelines shall apply to all components.
- A standardized method for assessing and analyzing environmental quality managed by AWWA (American Water Works Association)

APPENDIX B: MONITORING REPORT TEMPLATE FOR PROJECT IMPLENTATION UNIT

Safeguards Monitoring Report

Semiannual Report
xxx {month} 20xx

Viet Nam: xxx {Project name}, xxx {sub-project name, if report covers only one sub-project}

Prepared by the Project Management Unit of {complete name of Implementing Agency} for the {complete name of the borrower} and the Asian Development Bank.

NOTE

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

This safeguard monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

Executive Summary

{Read and delete: Provide short summary of the following items:

(iv) Summary of EMP/RP/REMDP Implementation
(v) Description of monitoring activities carried out (e.g. field visits, environment effect monitoring, survey questionnaire, public consultation meetings, focus group discussions, etc)
(vi) Key issues, any corrective actions already taken, and any grievances
(vii) Key activities planned in the next reporting period
(viii) Recommendations

Use the paragraph numbering format provided below throughout the report}

1. xxx
2. xxx

I. Project Overview, General safeguard matters

1. Project Overview

{Read and delete: Briefly describe project objectives, scope and components – can be taken from PAM or other relevant document}

3. xxx
4. xxx

2. Project Progress

{Read and delete: Using most recent project progress report, describe status of project implementation, including full list of contracts, status of contract awarding and implementation, name of contractor, Engineer, Project Supervision Consultant.}

5. xxx
6. xxx

Table 1: Project Overview, Snapshot of Project Progress

Project Number and Title:		
Safeguards Category	Environment	
	Indigenous Peoples	
	Involuntary Resettlement	
Reporting period:		
Last report date:		
Key sub-project activities since last report:	*{Read and delete: This section should include, among others, the following:}* Contract awarding	

	Progress of Work (% physical completion) Status of Safeguard Approvals / Permits / Consents
Report prepared by:	

3. Safeguard Plans Implementation Arrangements

{Read and delete: Describe institutional arrangements and responsibilities for EMP and RP/REMDP implementation, internal and external monitoring, and reporting, defining roles of PMU, Construction Supervision Consultant, Loan Implementation Supervision Consultant, Contractors. (Table format as needed)}

7. xxx
8. xxx

4. Updated EMPs and RPs/REMDPs, Incorporation of Safeguards Requirements into Project Contractual Arrangements

{Read and delete: Define manner by which EMP and RP/REMDPs requirements are incorporated into bidding documents, contracts.

Indicate when updated EMPs and RPs/REMDPs were submitted for approval to ADB (Table format appropriate).}

9. xxx
10. xxx

II. Environmental Performance Monitoring

1. Status of EMP implementation (Mitigation Measures)

{Read and delete: Summarize main mitigation/protection measures implemented in the reporting period (narrative section). Structure in accordance to phases (detailed design, construction preparation, construction, and operation).}

11. xxx
12. xxx

{Read and delete: Include EMP table or updated EMP table if applicable. Assess compliance of environmental management activities with the original or updated EMP. For that purpose, include additional columns entitled “Compliance Status”, "Comment or Reasons for Non-Compliance", and "Issues for Further Action". Example is provided below.}

Table 2: Compliance with EMP Requirements (Environmental Performance)

EMP Requirements	Compliance Status (Yes, No, Partial)	Comment or Reasons for Non-Compliance	Issues for Further Action
Use environmental impact as main heading and EMP as listing (see example below)	Use EMP list as basis for rating/evaluating compliance (see example below)		

Rise of employment opportunities: Job openings of the project should give priority to local communities. Recruitment of local laborers should be stipulated in the contract for construction	Field inspections and interviews with communities - DONE Note each complaint case in the field – 3 COMPLAINTS RECEIVED Set up grievance Centre and report as part of monitoring action plan – NOT DONE		

Table 3: Issues for Further Action

Issue	Required Action	Responsibility and Timing	Resolution
Old Issues from Previous Reports			
List of EMP measures or activities not completed (last column of previous table)			
New Issues from This Report			

2. Health and Safety

{Read and delete: Provide narrative of occupational and community health and safety issues that occurred during the reporting period. Any accident involving injury or death of workers or community members must be reported. Include investigation report of DOLISA as attachment to the report. Provide details in the Table below}.

13. xxx
14. xxx

Table 4: Health and Safety Issues

Issue	Required Action	Responsibility and Timing	Resolution
Old Issues from Previous Reports			

New Issues from This Report			

3. Environment Effect Monitoring

Monitoring plan. xxx {Read and delete: Present the environment effect monitoring plan as defined in the EMP or the updated monitoring plan. Refer to Table 4. Describe monitoring responsibilities}

Monitoring activities in the reporting period. Xxx {Read and delete: Describe the environment effect monitoring activities in the reporting period, including number of monitoring campaigns, number of samples, etc. Confirm compliance with the monitoring plan, or justify any deviation from the plan}

Table 4: Environment Effect Monitoring Results in the Reporting Period

{Read and delete: Present monitoring result in a Table (see example below, adjust as needed). Any non-compliance should be highlighted for attention and follow-up.}

Location	Parameter	Date	Monitoring value	Relevant government standard, standard value

Assessment. Xxx {Read and delete: Compare monitoring results with baseline conditions (if baseline data is available) and relevant government standards in qualitative terms. Additional explanatory comments should be provided as necessary. Possible reasons for non-compliance should be identified.}

III. Involuntary Resettlement Performance Monitoring

{Read and delete: Provide narrative of status of implementation of the RP(s), including but not limited to: status of RP or Resettlement Framework updating; number of households relocated during the reporting period; outstanding resettlement activities; etc}.

15. xxx
16. xxx

Table 6: Summary of Compliance with RP Requirements

RP Requirements	Compliance status Yes/No/Partial	Comment or Reasons for Compliance, Partial Compliance/Non-Compliance	Issues for Further Action[5]
Establishment of personnel in PMU		{Read and delete: This section should include, among others, the following:} Identify position and name of Safeguards/Resettlement staff of the PMU	
Public consultation and socialization process		{Read and delete: This section should include, among others, the following:} Provide information on: Public consultation, participation activities carried out Inclusive dates of these activities To be elaborated on in Item 5	
Land area to be acquired is identified and finalized		{Read and delete: This section should include, among others, the following:} Provide information on: Land area (of each parcel to be acquired) Current land use (residential, agri, etc) Current ownership status (private, state) Provide attachments on land titles/user rights certificates,	
Resettlement plan(s) updated after detailed design			
Land acquisition completed			
Establishment of Resettlement Site(s)		Please state: Number of AHs to be relocated as per agreed RP Number of AHs already relocated Number of houses built Status of installation of community facilities to be provided as per agreed RP	
Compensation payments for		Please state: Total Number of Eligible AHs and APs (as per agreed RP)	

[5] To be elaborated further in table 3.b (Issues for Further Action)

affected assets is completed		Number of AHs and APs compensated as of this monitoring period Total Budget allocation as per agreed RP Total budget disbursed to AHs as of this monitoring period	
Transport assistance for relocating affected households		As above	
Additional assistance to vulnerable affected household		Please state: Total Number of vulnerable AHs and APs (as per agreed RP) Agreed forms of assistance as per RP Number of AHs and APs assisted as of this monitoring period	
Income Restoration Program		Please state progress per income restoration feature/activity and actual period of implementation	
Temporary impacts have been addressed (affected properties restored to at least pre-project conditions)		Please state: Total Number of AHs affected by temporary impacts as per agreed RP Actual Number of AHs and total area affected by temporary impacts (if this differs from the projected number, such as in cases of unforeseen project impacts) Status of restoring affected property	
Capacity building activities			

Table 7: Issues for Further Action

Issue	Required Action	Responsibility and Timing	Resolution
Old Issues from Previous Reports			
List of RP activities not completed (last column of previous table)			
New Issues from This Report			

IV. Compliance with safeguards related project covenants

{Read and delete: List all environment and resettlement related loan covenants, and assess project's compliance with the covenants (Table format is appropriate, with concluding statement on compliance, partial compliance or non-compliance, and corrective actions as needed)

Schedule	Para No.	Covenant	Remarks/Issues (Status of Compliance)
Schedule 5	xxx		Complied with / Partially complied with / Not complied with. {Identify reason for partial or non-compliance}

V. Public consultation, Information Disclosure, Capability Building

{Read and delete: Describe public consultation activities during the reporting period. Confirm compliance with consultation plan defined in the IEE/EMP and the RP(s), or justify deviation from these plans. Present planned consultation activities in next reporting period. Use Tables as appropriate.}

(ix) Field Visits (sites visited, dates, persons met)
(x) Public Consultations and meetings (Date; time; location; agenda; number of participants disaggregated by sex and ethnic group, not including project staff; Issues raised by participants and how these were addressed by the project team)
(xi) Training (Nature of training, number of participants disaggregated by gender and ethnicity, date, location, etc.)
(xii) Press/Media Releases
(xiii) Material development/production (e.g., brochure, leaflet, posters)
(xiv) Information disclosure

VI. Grievance Redress Mechanism

{Read and delete: Describe mechanisms established to address and redress public complaints and grievances related to social and environment safeguards. Summarize grievances received, if any, and measures implemented to redress them.}

(xv) Number of new grievances, if any, since last monitoring period: ____
(xvi) Number of grievances resolved: _____
(xvii) Number of outstanding grievances: _____

Type of Grievance	Details (Date, person, address, contact details, etc.)	Required Action, Responsibility and Timing	Resolution
Old Issues from Previous Reports			

New Issues from This Report			

Conclusion

{Read and delete: Highlight important results from the implementation of EMP and RP monitoring; recommendations to improve EMP and RP management, implementation, and monitoring; key activities planned in next reporting period}.

17. xxx
18. xxx

Attachments

(xviii) Consents / permits
(xix) Monitoring data (water quality, air quality, etc.)
(xx) Inspection checklists
(xxi) Photographs
(xxii) Others