



THE SOCIALIST REPUBLIC OF VIETNAM
MINISTRY OF TRANSPORT
PROJECT MANAGEMENT UNIT OF WATERWAYS

World Bank



**NORTHERN DELTA TRANSPORT DEVELOPMENT PROJECT
(NDTDP)**

**CORRIDOR 3
Day – Ninh Co junction Canal and crossing bridge
(DNC)**

Environmental Impact Assessment – Vol 2

Environment Management Plan (EMP)



In association with



August 2016

QUALITY ASSURANCE SHEET

CLIENT:	Project Management Unit of Waterways (PMU-W)
Address:	6th Floor, Thang Long PMU build., Linh Nam ward, Hoang Mai dist., Hanoi
CONTRACT:	Credit N° 4474 – VN Contract N° CS-A5i-NDTDP-A
Date:	December 2015
Title:	EIA Vol 2 - Environmental Management Plan (EMP)

Consultants

CNR Compagnie Nationale du Rhône, Lead Firm
 Direction de l'Ingénierie
 2 rue André Bonin, 69 316 Lyon cedex 04 France

VIPO Trading and Investment Consultant JSC, Subcontractor,
 AC building, 2nd floor, 78 lane, Duy Tan str., Cau Giay, Hanoi, Vietnam

Quality Control

	Name	Date	Signature
Done by :	F. PRESSIAT (CNR) PHAM ANH TUAN (VIPO)	April 2016	
Verified by :	F. PRESSIAT (CNR)	August 2016	
Approved by :	L.THAREAU (CNR)	August 2016	

File Historical account

N°	Date	Revision
1	29 December 2015	1 st version
2	12 February 2016	2 nd version
3	07 April 2016	3 rd version
4	28 June 2016	4 th version
5	18 August 2016	5 th version

TABLE OF CONTENTS

1. INTRODUCTION.....	5
1.1. Background	5
1.2. EMP Framework.....	5
1.3. EMP Source Documents	7
2. PROJECT OVERVIEW	8
3. KEY ENVIRONMENTAL RISKS	15
3.1. Pre-Construction Phase.....	15
3.2. Construction Phase.....	15
3.3. Operation Phase	16
4. RESPONSIBILITIES FOR EMP IMPLEMENTATION	17
5. PLAN COMPONENTS AND STRUCTURE	20
5.1. Primary Responsibilities in the Implementation of the EMP	20
5.2. EMP Structure	21
6. ENVIRONMENTAL AND SOCIAL IMPACTS MANAGEMENT	25
7. PUBLIC HEALTH AND SAFETY MANAGEMENT PLAN	36
8. ENVIRONMENTAL SUPERVISION FRAMEWORK	43
9. ENVIRONMENTAL MONITORING FRAMEWORK.....	47
10. COMMUNICATION AND REPORTING	52
11. CAPACITY BUILDING AND TRAINING	56
12. EMP MONITORING AND REVIEW	58
13. ADDITIONAL BASELINE DATA COLLECTION	60
14. IMPLEMENTATION	61
15. EMP COSTS	62
16. REFERENCES	63
ANNEX.....	64

Abbreviations

Abbreviation	Description
BOD ₅	Biological Oxygen Demand
COD	Chemical Oxygen Demand
CEO	Contractor Environmental Officer
CST	Construction Supervision Team
CSC	Construction Supervision Consultant
DO	Dissolved Oxygen
DONRE	Department of Natural Resources and Environment
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPC	Environmental Protection Commitment
HSO	Health and Safety Officer
MOT	Ministry of Transport
MONRE	Ministry of Natural Resources and Environment
NDTDP	Northern Delta Transport Development Project
NGO	Non-Governmental Organization
NO _x	Nitrogen Oxides
NTP	Notice-to-Proceed
OP	Operational Policy
PEO	Project Environmental Officer
PM ₁₀	Particulate Matter with diameter of 10 µm or less
PMU-W	Project Management Unit of Waterways
PPC	Provincial People Committee
RAP	Resettlement Action Plan
SEO	Supervising Environmental Officers
SO _x	Sulphur Oxides
TOR	Terms of Reference
TSS	Total Suspended Solids
TSP	Total Suspended Particulates

1. INTRODUCTION

1.1. Background

This Environmental Management Plan (EMP) for the Northern Delta Transport Project – Component A: Inland Waterways Corridor 3 (Corridor 3) – DNC Project identifies the principles, procedures and methods that will be used to control and minimize the environmental and social impacts of all preconstruction, construction and operation activities associated with project development. It is intended to complement the project Environmental Impact Assessment (EIA) and to ensure that commitments made by the Project Management Unit of Waterways (PMU-W) to minimize project-related environmental and social impacts are considered throughout the duration of the project.

The EMP is also a companion document to the Resettlement Assessment Plan (RAP) which aims to mitigate resettlement impacts and avoid or minimize social impacts arising from the project.

As part of the continuous commitment to excellence in environmental and social performance for inland waterways projects, Ministry of Transport (MOT), through the PMU-W will ensure the following:

- Fulfill all environmental and social requirements associated with project approval;
- Develop, promote and foster a shared sense of responsibility for environmental and social performance of the project;
- Promote environmental awareness and understanding among employees and contractors through training, identification of roles and responsibilities towards environmental and social management and linking project performance to overall environmental performance;
- Encourage an understanding of social and cultural sensitivities in local communities and the importance of minimizing project impacts on local lifestyles and culture;
- Monitor environmental and social performance throughout the project and implement an adaptive management approach to continuous improvement;
- Work with local communities and project-affected stakeholders to ensure that they benefit as a result of project development; and
- Maintain an on-going commitment to informing, engaging and involving local stakeholders in all phases of the project.

1.2. EMP Framework

This EMP is designed as an overriding document in a hierarchy of control plans, and sets out the overarching framework of environmental management principles that will be applied to the project. It is directly related to the accompanying Environmental Impact Assessment (EIA) for the DNC Project under Corridor 3 of NDTDP.

The EMP contains guiding environmental principles and procedures for communication, reporting, training, monitoring and plan review to which all MOT and PMU-W staff, contractors and subcontractors are required to comply with throughout the pre-construction, construction and operation phases of the Corridor 3.

The EMP should also be considered as an overall framework document that establishes the terms of reference for all project environmental and social sub-plans, which include the following:

- Construction and Workers Camp Management Plan (construction);
- Environmental Supervision Plan (construction);
- Environmental Monitoring Plan (construction and operation); and
- Health and Safety Management Plan (construction and operation).

The terms of reference for preparation of these contractor plans are presented in the Appendices of the EMP:

- An introduction is provided in Part 1.
- An overview of the project is provided in Part 2.
- Roles and responsibilities for environmental and social management are described in Part 3.
- Key environmental and social risks as identified from the project EIA are presented in Part 4.
- Mitigation measures for pre-construction, construction and operation phases are presented in Part 5.
- A framework for Environmental Supervision is presented in Part 6.
- A framework for Environmental Monitoring is presented in Part 7.
- Communication and reporting procedures are described in Part 8.
- Training and capacity building requirements are discussed in Part 9.
- Plan monitoring and review procedures are presented in Part 10.
- Preliminary EMP costs are discussed in Part 11.
- Additional information is presented in the Annexes as follows:
- Annex A contains the Construction Worker Camp Management Plan Bid Specifications to be included in Contractor documents;
- Annex B is the Monitoring Plan;
- Annex C is the TOR for Environmental Supervision;

1.3. EMP Source Documents

- Feasibility Study Report of Northern Delta Transport Project, Royal Haskoning, SMEC and Centre of VAPO, March 2008;
- Feasibility Study Report of Northern Delta Transport Project, Appendix IIa, Environmental Impact Assessment for Corridor 3, Royal Haskoning, SMEC and Centre of VAPO, March 2008;
- Environmental Management Plan (EMP) of NDTDP – Component A: Inland Waterways Corridor 1, EGIS-BCEOM International, September, 2010;
- Environmental Impact Assessment (EIA) of NDTDP – Component A: Inland Waterways Corridor 3, Compagnie Nationale du Rhône (CNR), November, 2012;
- Resettlement Assessment Plan (RAP) of NDTDP – Component A: Inland Waterways Corridor 3, CNR-VIPO consultant partnership, September, 2012.
- NDTDP Corridor 3 – EIA – EN version approved by WB - April 2013
- NDTDP Corridor 3 – EIA – VN version approved by MONRE – December 2013
- EMP Corridor 3 – EN version approved by WB and MONRE – April 2013.
- Decision of MONRE No. 126/TCMT-TD dated 21st January 2016 Regarding EIA report under Northern Delta Transport Development Project – phase 2.

2. PROJECT OVERVIEW

The project region of the Northern Delta Transport Development Project (NDTDP) Phase II (Project WB6) covers 3 provinces, namely: Phu Tho, Ninh Binh and Nam Dinh.

The Red River Delta system make an outstanding network of inter-connected navigable waterways covering most of the northern coastal area on East/West axis for Corridor one and Northern/Southern axis for Corridor 3. It provides major transport routes from the port of Hai Phong to Pha Lai, Hanoi and Viet Tri (Corridor 1) and from ports of Viet Tri and Ninh Phuc to Day and Ninh Co River mouths (Corridor 3). The river system has naturally fairly favorable navigation condition and is extensively used for transport of main bulk commodities (sand and gravel, cement, timber coal and fertilizer). In parallel the road network of the Northern Delta region is not yet fully developed and the share of waterways transport is 67% of total transport performance in ton.km.

To enhance the advantage provided by the naturally favorable conditions of Inland Waterways and its environmentally friendly contribution to the Country's transport system the Government of Vietnam has embarked in two main projects: the Mekong Delta Transport Infrastructure Development Project (MDTIDP) and the Northern Delta Transport Development Project (NDTDP). The Vietnamese Government received a credit amount from the International Development Association (IDA) and the World Bank. This Inception report concerns the item no. CS-A5i-NDTDP. Detailed Design and Bidding Documents Preparation for Phase 2 of Northern Delta Transport Development Project (NDTDP).

A feasibility study and preliminary engineering designs for the Northern Delta Transport Development Project – NDTDP was approved in 2008 including 3 components and several subcomponents as follows:

Component A: Multimodal Transport Corridor Investments

- Subcomponent A1. Improvements of two National Waterways corridors :
 - (i) east-west northern corridor between Viet Tri and Quang Ninh; and
 - (ii) north-south western corridor between Hanoi and Ninh Co River estuary.
- Subcomponent A2. Improvements to Ninh Co River Estuary and an inter-connecting canal between the Day and Ninh Co Rivers with a navigation lock
- Subcomponent A3. Improvements to Provincial Ports
- Subcomponent A4. Pilot Maintenance Contracts

Component B: Investments in small ferry boat stages

The purpose of the component B is to provide safer and wider access within the region. At present, there are over 1,000 small ferry boat stages for river-crossing passenger boats. Access to these ferries from the roads is often dangerous and many accidents resulting in fatalities have occurred. This component includes developing standards for the design and

operation of the different size ferry boat stages and will lead to the physical improvement of 15-30 of these stages. The development of a framework of standards for the design and operation of the different sizes of ferry boat stages will be part of the institutional support component for this project.

Component C: Institutional support to MOT and provinces.

The present Consulting Service is for Detailed Designs and preparation of bidding documents for Phase II of Northern Delta Transport Development Project (NDTDP) under Subcomponent A2 of Component A - Multimodal Transport Corridor Investments above i.e., the so-called Corridor 3.

This component will include:

- Support to the Vietnam Inland Waterways Administration and Provinces in implementation of Law 23/2004/QH 11 for: (a) extension of the asset management database to this region, (b) planning of and budgeting for sustainable inland Waterways management and maintenance programs, and (c) management of safety function.
- Support to MOT and Provincial Departments of Transportation (PDoTs) (including navigational schools) in planning multi-modal transportation infrastructure and logistics services taking full consideration of the potential role of the private sector.
- Support to MOT and provincial governments in developing and strengthening existing frameworks for private sector participation in the provision of infrastructure and services associated with provincial ports, landing stages and logistics centers.

Corridor 3 consists of:

- A coastal channel in Lach Giang estuary,
- Several different river sections including Ninh Co and Red rivers from the sea to Hanoi,
- A connecting canal between Ninh Co and Day rivers
- A section of Day river from the connecting canal to Ninh Phuc port
- Ninh Phuc and Viet Tri ports improvement.

The overall length of Corridor 3 is 183 km (from Hanoi to Lach Giang estuary). Besides, the project will improve 2 ports: Viet Tri port (Lo River, 90 km upstream from Hanoi) and Ninh Phuc port (in Day River). The required hydrographical and topographical surveys to be undertaken, however, will cover the inland Waterways and the Lach Giang estuary.

The Project is expected to increase the capacity of the inland Waterways transport system to meet growing transport demands and support economic development by reducing transport costs for both producers and consumers. After improvement the Waterways will be able to allow:

- 3000 DWT from Lach Giang estuary to the bifurcation point of the Day river and Dao Nam Dinh river – River mouth section 1

- 3000 DWT and barges 4X400 Tons from the bifurcation point of the Day river and the Dao Nam Dinh river to Ninh Phuc port – River mouth section 2
- 1050 DWT and barges 4x400 Tons from Hanoi port to the bifurcation point of the Red river and Ninh Co river (sector of Mom Ro). – Corridor 3 – section 1
- 3000 DWT for the Ninh Co river – Corridor 3 – section 2

The project's initial contents concern:

- Viet Tri port modernization,
- Mom Ro deviation channel and bend correction;
- Do Bui bend correction;
- Ninh Phuc port modernization;
- A connecting canal and lock ship between Day River and Ninh Co River;
- A bridge over DNC canal;
- A Channel access from the sea to the estuary and breakwaters in the Ninh Co estuary (Lach Giang estuary);
- Support marine through supplementing, repairing and improving aids to navigation in Red river, Day River and Ninh Co River;

The Corridor 3 sub-project was accepted and the EIA + EMP + RAP were approved by the World Bank and MONRE in 2013.

The construction phases started by 2013 (land clearance) and were achieved between 2014 and 2015 for:

- Viet Tri port;
- Mom Ro ;
- Do Bui;
- Ninh Phuc Port;
- Lach Giang estuary;
- Navigation aids.

The construction of DNC canal and ship lock was delayed due to the duration of discussions between MOT, Province, Districts and Communes for the type of bridge (mobile or fixed) and for its air clearance. The alternative for the bridge over DNC canal is fixed with a fixed bridge of 15 m air clearance and was approved by MoT in the letter No.14457/BGTVT-KHĐT dated 14/11/2014.

This phase of the project concerns:

- Construction of a junction canal between Day and Ninh-Co rivers and of a ship lock following 2013 detailed design;
- Construction of a fix bridge with 15 m of air clearance to cross the new canal following 2015 preliminary design;
- Relocation of the access road following 2015 preliminary design.

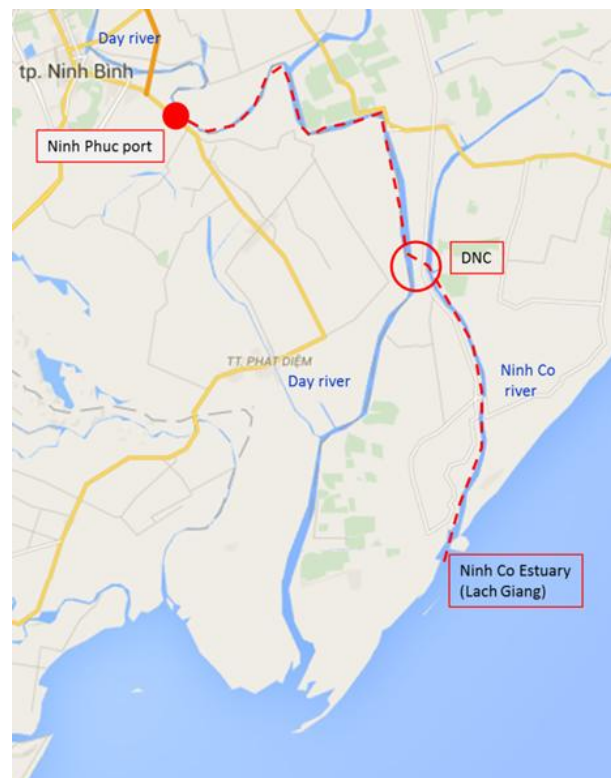


Figure 1: Location of Corridor 3 from Lach Giang to Ninh Phuc port

The main design choices and considerations for the Corridor 3 are:

- 1) The 4 x 400 Tons barges are expected to sail from Ninh Phuc port to Hanoi port, on the Dao Nam Dinh River and the Red river.
- 2) The maximum sea river vessel considered to sail all the way to Hanoi has a capacity up to 1050 DWT.
- 3) The 3000 DWT sea river vessel will sail to Ninh Phuc port, but will not continue to Hanoi.

The upgrading of the corridor 3 will entail dredging; bend corrections, bank protection, shoal regulation, a ship lock and a fix bridge at DNC area through the main canal and provision of aids to navigation.

This phase of the project concerns the construction of a canal and a ship lock permitting the transfer between Day and Ninh Co River of 3000 DWT sea/river vessels and 4 x 400 Tons barges.

The main objectives of the Consulting Services are:

- To assist PMU-W to prepare/refine as necessary the planning and feasibility studies, including resettlement action plans and environmental management plans identified by the Feasibility Study Consultants;
- To prepare detailed engineering designs, cost estimates and bidding documents for improvement of Waterways corridor 3 (including dredging, bend correction, groins and bank protection, aids to navigation system, selected for the Phase II program;

- To ensure that environmental (including the dredge management plan), social and resettlement requirements outlined during the feasibility studies are adequately covered in designs and bidding documents.

DNC Project Needs:

The DNC project purposes consist in:

- **Construction of a junction canal between Day and Ninh Co Rivers and of a ship-lock following 2013 detailed design;**
- **Construction of a fixed-span bridge with 15 m of air clearance to cross the new canal following 2015 preliminary design;**
- **Relocation of the ferry access road following 2015 preliminary design.**

Project Location

The Corridor 3 project areas are located in Northern Vietnam and concern a part of the Inland Waterways of the Red River Delta, from Hanoi to the sea. The project mostly concerns the Ninh Co River and for a smaller part, Lo and Day rivers.

The initial project was divided in 6 construction sites, located in 3 provinces:

- Nam Dinh province,
- Ninh Binh province
- Phu Tho province.

The DNC project construction site is located in Nam Dinh province, Nghia Hung District, Nghia Son and Nghia Lac communes.

The project includes also the reconstruction of the actual road (1195 m) and a bridge to cross the canal with 15 m of air clearance and 780 m long.

Table 1: Project Coordinates

Description	Coordinate
DNC canal	X = 517636.2906
	Y = 2227886.0288

Overview of the project sites is shown in Figures 2 and 3.

Figure 2: General location map of Corridor 3



**Figure 3: Overview of project sites include in corridor 3
(Green = done - Yellow = to build)**

3. KEY ENVIRONMENTAL RISKS

The Corridor 3 EIA (2012) and the DNC EIA (2015) were used to develop the key environmental and social risks associated with the pre-construction, construction and operation phases of the DNC project. Each impact is discussed below.

3.1. Pre-Construction Phase

Table 2. Key environmental Pre-construction Phase impact

Issue	Impact/Risk
Land acquisitions for construction site, workers camp and disposal areas.	▪ Land acquisitions
	▪ Land clearance and preparation
	▪ Loss of houses and constructions
	▪ Workers camps building
	▪ Loss of plants / agricultural lands
	▪ Loss of ponds
	▪ Network et utilities (electrical lines, supply water distribution networks, telecommunications)
	▪ Ferries relocation
	▪ Historical and religious heritage
	▪ Roads and tracks relocation

3.2. Construction Phase

The following key environmental risks have been identified for the construction phase of the project. These are identified in Table 3.

Table 3: Summary of Key Environmental Construction Phase Impacts

Issue	Impact/Risk
Construction activities (excavating / dredging / soil disposal / bank protection / bend correction / ship lock building / driving pile / berth construction / Crossing bridge / access road)	▪ Noise pollution and vibration
	▪ Dust and gas pollution
	▪ Road and Waterways traffic
	▪ Decreased surface water quality
	▪ Decreased sediment quality
	▪ Decreased in the quantity of aquatic fauna
	▪ Contamination of heavy metals
	▪ Accidents
	▪ Effect of hazardous and toxic chemical wastes
	▪ Changed in water velocity

Issue	Impact/Risk
Auxiliary Project (Road, Transmission lines, etc.)	▪ Solid and liquid wastes
	▪ Erosion and sedimentation
	▪ Noise pollution and vibration
	▪ Dust and gas pollution
Construction camp	▪ Increased road traffic
	▪ Construction of new camps
	▪ Job creation
	▪ Increased demand for infrastructure and utilities
	▪ Adversely affect the socio – economic conditions of the affected residents
Health	▪ Solid and liquid waste
	▪ Increased disease transmission rates
	▪ Increased drug trade and use
Cumulative Effects	▪ Increased demand for health services
	▪ Neither the Ministry of Transport nor local authorities/provincial governments have any planned future projects, or projects currently under execution, in the DNC canal project area.

3.3. Operation Phase

The following key environmental risks have been identified for the operation phase of the project. These are identified in table below:

Table 4: Summary of Key Environmental Operation Phase Impacts

Issue	Impact/Risk
Transport in Waterways	▪ Erosion and Sedimentation
	▪ Water pollution due to oil spills/leaks from ships and ports
	▪ Hydrology change
	▪ Road and Waterways traffic
Environmental problems	▪ Collision of ships
	▪ Sinking ship
	▪ Oil spill
	▪ Noise

4. RESPONSIBILITIES FOR EMP IMPLEMENTATION

In order to achieve the mitigation and minimizing the negative environmental impacts of the project, the EMP has been adopted into the technical specifications and contract documents. It will need to be closely followed and implemented by the Contractors. The implementation of the EMP will therefore involve two main parties:

- The Contractor's Workplace Safety and Environment Officer (SEO) responsible for implementing the EMP and other construction related environmental and safety issues.
- The Construction Supervision Engineer(s) (CSE) who is / are responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSE will include a Workplace Safety and Environment Supervisor (SES).

This section describes the organizational structure and responsibilities needed in the implementation of the EMP.

Table 5. Role and Responsibilities for EMP Implementation

Organization	Responsibilities
Project Management Unit for Waterways (PMU-W)	<ul style="list-style-type: none"> • Sign contract with consultant. • Organize the Environmental Unit (EU) responsible for the environmental aspects of the project. • The Environmental Unit of the project shall be composed of representatives from the Ministry of Transport/PMU, Department of Natural Resources and Environment of Phu Tho, Ninh Binh and Nam Dinh provinces. • Allocate budget for environmental monitoring activities during pre-construction and construction stages of the project. • Endorse/submit the monthly and annual reports to the Provincial or Local People's Committees, as well as to the Ministry of Natural Resources and Environment.
Environmental Unit (EU)	<ul style="list-style-type: none"> • Make sure all the proposed terms and conditions of environmental protection in the Bid Documents are included in the Project Contract. • Review and analyze reports on environmental monitoring during project construction stage • Conduct periodic inspection of construction activities to ensure the full implementation of the EMP by the contractor as specified in the contract. In cases where the provisions are not implemented, the Environmental Unit shall be responsible for reporting the matter directly to the Project Director, who has the

Organization	Responsibilities
	<p>right to suspend the work of contractors.</p> <ul style="list-style-type: none"> • Coordinate with the Construction Supervision Consultant (CSC) regarding the Contractors/Sub-Contractors compliance with EMP. • With the assistance of the CSC, prepare monthly and annual reports.
<p>Construction Supervision consultant (CSC) Or Construction Supervisor</p>	<ul style="list-style-type: none"> • Coordinate with the Environmental Unit (EU) and the Project Contractors to ensure the full implementation of measures for environmental protection and minimize the negative environmental impacts as written in the project contract and the contractor's commitment in the Environmental Management Plan (EMP). • Issue site instructions to the contractor for any potential environmental issues observed that may hinder the progress of the project. • Receive and review the monthly monitoring reports of the Contractor/Sub-Contractors. • Prepare quarterly reports and submit to PMU/EU at least 25th of the 3rd month of each quarter.
<p>Project Contractor</p>	<ul style="list-style-type: none"> • Responsible in the full implementation of measures for environmental protection as specified in the contract and their commitment in the Environmental Management Plan (EMP). • Coordinate with the CSC should there be environmental issues to be discussed. • Must ensure that their hired sub-contractors also must do full implementation of measures for environmental protection which was signed in the contract of the project and their commitment in the Environmental Management Plan (EMP).
<p>Sub-consultant</p>	<ul style="list-style-type: none"> • Conduct environmental monitoring. • Directly report the monitoring results to the CSC within one week from the date of sampling. These results will be reviewed by appropriate staff. • Carry out additional tests as requested.

Sampling, testing and analysis will be undertaken by the Contractor directly or as subcontract to a qualified local environmental monitoring group. Field and laboratory results will be reported to the CSC within one week from the date of sampling. These results will be reviewed by appropriate staff.

Various mitigation measures have to be adopted by the project to reduce identified impacts. These measures will form part of the project activities. In addition, where monitoring programs define conditions of “unacceptable impact” or exceedance of criteria, the PMU/CSC will review the exceedances and discuss operational issues with the Engineer for that project section. As appropriate, the concerned party (PMU or Contractor) will institute further mitigation measures. These additional measures may be short-term or long-term, depending on the nature, scope and timing of the exceedance.

The PMU-W will provide, on a monthly basis, the results of monitoring and implementation of mitigation measures to the Provincial or Local People’s Committees, as well as to the Ministry of Natural Resources and Environment. Further, PMU-W will provide an annual summary report of monitoring and implementation of mitigation measures to the Provincial and Local People’s Committees and the Ministry of Natural Resources and Environment.

5. PLAN COMPONENTS AND STRUCTURE

This Part discusses the sub-components of the EMP, the plans, the structure, objectives, schedule, responsibility and costs.

5.1. Primary Responsibilities in the Implementation of the EMP

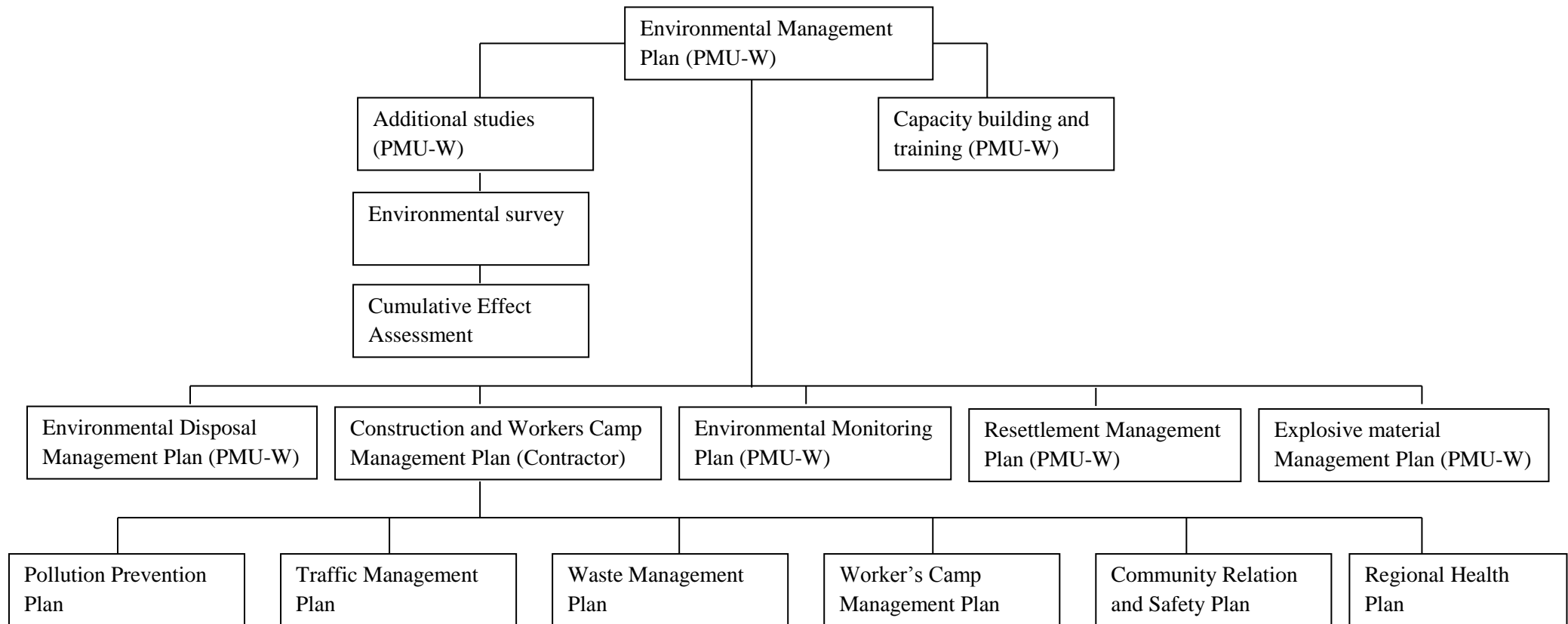
Table 6 itemized the plans, the duties and responsibilities of each player involved in the plan, the schedule of its implementation and other details.

Table 6: Primary Responsibilities in the Implementation of the EMP

Plan	Sub-Plan	Primary Responsibility for Implementation		
		PMU-W	Engineering Supervisor	Contractor
Construction and Workers Camp Management Plan	Construction Camps Management Plan		√	√
	Construction Impact Management Plan		√	√
	Waste Management Plan		√	√
	Pollution Prevention Plan		√	√
	Safety during Construction		√	√
	Training for Construction Worker		√	√
	Construction Worker Health Management Plan		√	√
Environmental Monitoring Plan		√	√	
Environmental Management Disposal Plan		√	√	√
Training and Capacity Building		√		√
Plan Costs		√		

5.2. EMP Structure

Figure 4 provides the organization or EMP Structure with the players indicated in the boxes.



Environmental Monitoring Plan

Objectives:

The objectives of the environmental monitoring plan are to a) ensure project components are compliant with all laws and approval conditions b) measure the success of proposed mitigation measures c) continue baseline monitoring and d) facilitate a continual review of post-construction and operation activities.

Description:

Environmental monitoring will be done during construction and operation. Details of the proposed environmental monitoring program are presented in Section 8 of the EMP.

Construction

The focus of monitoring during the construction phase will be to implement systematic observations to periodically measure the success of proposed mitigation measures and continue baseline data collection.

The majority of construction monitoring shall be done visually and verified by the Construction Supervisor. An Independent Environmental Monitoring Consultant

Operation

Monitoring during the operation phase shall reflect those environmental and socio-economic issues that may persist upon completion of construction activities. Monitoring shall focus on evaluating the effectiveness of project mitigation measures and continue baseline monitoring and sampling. Monitoring activities should focus on the following:

- Air quality
- Water quality
- Compliance with speed limits in the Waterways
- Monitoring of Maintenance Dredging
 - Water quality
 - Sediment quality
 - Soil quality

Timing/Schedule:

Environmental monitoring shall start as soon as the project is given the Notice-to-Proceed (NTP), and monitoring equipment shall be ready to be mobilized prior to the onset of construction activities.

Responsibility:

Monitoring shall be implemented throughout all project phases and managed by the PMU-W. The PUM-W will also be responsible for ensuring that the surrounding environment and social communities are protected throughout the life of the project

Construction Impact Management Plan

Objectives:

Minimize negative impacts of construction activities on local communities and the natural environment.

Description:

Preparation of the Construction Management Plan will be the responsibility of the construction contractor (including Pollution Prevention Plan, Traffic Management Plan, Waste Management Plan, Workers Camp Management Plan, Community Relation and Safety Plan, Health Management Plan); a detailed TOR is presented in Annex A. The plan addresses the following elements:

- Design requirements and environmental protection measures for construction camps;
- Security and safety;
- Maintenance of camp facilities;
- Worker code of conduct;
- Erosion and sedimentation;
- Particulate emissions and dust;
- Noise;
- Stockpiles and borrow areas;
- Waste management;
- Pollution prevention;
- Environmental training for Construction Workers
- Construction Workers Health Management

Timing/Schedule:

- Pre-construction: Design requirements, safety and security, camp maintenance, worker code of conduct, provisions for camp followers
- Construction: erosion/sedimentation, particulate emissions/dust, noise, earthworks, stockpiles/borrow pits, waste management, pollution prevention
- Operation: replanting and site restoration

Responsibility:

- Preparation and implementation of the Construction Management Plan will be the responsibility of the Construction Contractor.
- The Environmental Unit of the PMU-W will prepare bid documents incorporating plan provisions.
- The Supervising Engineer will oversee implementation of the plan.

Environmental Disposal Management Plan

Objectives:

Minimize negative impacts of dredging and disposal activities

Description:

Preparation of the Environmental Disposal Management Plan will be responsibility of the PMU. An Environmental Disposal Management Plan was prepared in a separate report. The plan addresses the following elements:

- Evaluation of Dredging methods;
- Recommend the suitable method for each area;
- Evaluation disposal areas;
- Recommend the suitable area for disposal;
- Recommend the mitigation measures of dredging and disposal during construction.

Timing/Schedule:

- The Environmental Disposal Management Plan should be implemented during construction.

Responsibility:

- Preparation of the Environmental Disposal Management Plan will be the responsibility of the PMU-W;
- Implementation of the Environmental Disposal Management Plan will be the responsibility of the contractor;
- The Environmental Unit of the PMU-W will prepare bid documents incorporating plan provisions;
- The Supervising Engineer will oversee implementation of the plan;
- The Independent Environmental Monitoring Consultant will review compliance of plan implementation against the plan terms of reference.

6. ENVIRONMENTAL AND SOCIAL IMPACTS MANAGEMENT

Table 7: Summary of the Environmental Management Plan

Project Phase/Activities	Impacts	Mitigation Measures
Preconstruction phase - Land acquisition / Displacement / Networks relocation	Predicted impacts in the EIA	Prepare an EMP as part of the Tender Document.
	Land acquisition and resettlement	<ul style="list-style-type: none"> - Prepare and implement the Resettlement Action Plan - Conduct Information, Education, Communication - Conduct Public Consultation - Prepare land for disposal sites - The Land Acquisition Board will inform the affected people within the time frame the reason for land acquisition the overall schemes for compensation, ground clearance and resettlement. After the decision on land recovery and schemes for compensations, ground clearance and resettlement have been agreed on and approved by the competent State Agencies and made public, the land holder must abide by the decision on land recovery or acquisitions. - The Project-Affected Households will be compensated or relocated that will improve their living Standard or at least the same with the previous condition. - PMU-W will co-ordinate with Land Acquisition Board of concerned areas to set up schemes for compensation and resettlement which will be implemented before the commencement of the project.

Construction Phase - Dredging, excavation, civil works:

Project Phase/Activities	Impacts	Mitigation Measures
Construction Phase - Dredging, excavation, civil works	Impacts on Air Quality	<ul style="list-style-type: none"> - Regular monitor the ambient air quality around the construction areas - Construction equipment emission shall be within the values of QCVN 05:2009/BTNMT & QCVN 06:2009/BTNMT. -Access roads will be located in unpopulated or sparsely populated area. - Fuels and materials transports must have canvas -Construction materials (e.g sand, clay, cement, stones) even during hauling should be covered -Concrete mixing plant emission will have to comply with the Vietnamese Standards for Air Emission (QCVN 05:2009/BTNMT & QCVN 06:2009/BTNMT). -Stockpile area will be located away from residential areas. -Regular sprinkling of water of exposed areas will be undertaken.
	Impacts on Noise and Vibration	<p>Noise and vibration in residential and public areas, the maximum allowable noise levels satisfy QCVN 26:2010/BTNMT and QCVN 27:2010/BTNMT.</p> <p>If there is any machine and equipment which cause excessive noise, it will be discontinued operation and repaired following requirements of environmental monitoring.</p> <p>Monitoring noise and vibration daily.</p> <ul style="list-style-type: none"> - In populous regions, the hospital or the schools, the pile driving works are only conducted from 18h
	Mitigation of Potential Impacts on Water Quality	<p><i>From Rivers Dredging</i></p> <ul style="list-style-type: none"> - Use cutter suction dredges, excavators and other earth-moving equipment where required. - Dredging close to the bank and on

		<p>wetlands (most important places for aquatic life) and on spawning areas should be carried out between October to May, avoiding the peak of biological activity of the Floods / rainy season.</p> <ul style="list-style-type: none"> - Do not over-dredge a channel section. - A berm of material should be retained during excavation in the dry. - Deploy a silt curtain around the dredge. - Regularly check water quality in river water and in the disposal area. - Ensuring oil and fuel in tanks are located far from water sources - All waste oil will be handled as committed. The empty fuel tanks and oil tanks may not be stored on site. - Ensure to clean and treat leaking oil - Sedimentation of water leakage before circulating the river. <p>Covering machinery and material site to prevent them from flowing to river. Cleaning and restoring the terrain at the end of operations.</p>
		<p><i>From Construction Camps</i></p> <ul style="list-style-type: none"> -Provide sealed septic tanks. -Provide impervious flooring, containment wall and floor sump to collect oily wash water and to allow separation of solids. <p>Storing hazardous materials (such as oil, cement ...) in separate areas located far from the river banks by covering from water and wind.</p> <p>Provide and maintain garbage cans with lids at construction and dredging contractor office and contact the unit to collect local waste disposal, sewage sludge land management contractors will be monitored closely at the dumps. Having waste collection contracts with functional units.</p> <p>Contractor will check the pH value, TSS of leakage from dumping site periodically. If</p>

		<p>the pH value is low or TSS value too high, the contractor will have prompt treatment method.</p> <p>River water quality and leakage water from dumping site in the construction phase are monitored regularly. Parameters are choose as follows: pH, temperature, turbidity, DO, TSS and conductivity.</p> <p>Contractors shall not create dumping site in the region of high density of ground water.</p> <p>All waste oil will be handled as committed. The empty fuel tanks and oil tanks may not be stored on site.</p> <p>Do not discharge waste water directly into any water sources. Domestic wastewater will be collected and processed through a septic tank.</p> <p>Contractors have to maintain stability of the slope to control erosion.</p> <p>The drainage system in the dumping site is lined with canvas and wooden poles to reduce the risk of erosion at the water outlet.</p> <p>Any issues or complaints regarding water quality will be addressed immediately by the necessary measures.</p> <p>All domestic and construction wastes on the site must be collected into the separated and labelled bins (at least 3 bins: 1 bin for domestic wastes, 1 bin for construction wastes (cement bags, electrical wiring, plastic pipe ...), 1 bin and hazardous wastes (lamp, oil stick wipes ...).</p>
	Construction Wastes	<p>-Practice waste segregation, recycling and waste minimization.</p> <p>-Hazardous wastes should be disposed in authorized disposal facilities.</p> <p>-Portable toilets should be placed in appropriate locations within a site.</p> <p>-All construction wastes on the site will be collected in bins and will be transported to the designated garbage sites on a regular</p>

		<p>basis.</p> <ul style="list-style-type: none"> - All construction wastes on site must be collected into the separated and labelled bins (at least 2 bins: 1 bin for construction wastes (cement bags, electrical wiring, plastic pipe ...), 1 bin and hazardous wastes (lamp, oil stick wipes ...). -Metal waste could be collected by a contract buyer. -Used oil from equipment must be contained in appropriate bins. Used oil will be transported off-site and processed after the project. -Soils from dredging must be loaded/ transported /disposed properly.
	Restoration of Land Occupied by Construction Camp / Staging Area	<ul style="list-style-type: none"> -Remove all equipment, structures, rubbish and obstructions and restore the land to its original condition. - Clean-up camp area after project completion - Keep the surface layer of soil with leaves and organic matter, re-use this land in disturbed areas to enhance the development of local vegetation.
	Impacts of Spoil Disposal	<ul style="list-style-type: none"> - Supernatant water will be discharged from the transport barges at the dredging site before moving to the designated area. - Use cutter suction dredge with materials transported by pipeline to designated disposal sites where required. - Construct temporary berms on two or more sides to an appropriate height to prevent the loss of supernatant water and/or disposed sediments. -Deployed silt curtain. - Follow the Dredged Materials Disposal Plan.
	<i>Spillage of chemicals</i>	<ul style="list-style-type: none"> -The dredging and excavation contractors will be required to maintain suitable equipment, booms and other clean-up supplies to respond to spills or leaks

		<p>associated with loss of petroleum hydrocarbons from their equipment.</p> <p>The Project Environmental Protection and Implementation Plan will provide detailed instruction on reporting, clean-up of spills and general response procedures.</p>
	<i>Traffic congestion</i>	<p><i>Traffic Management</i></p> <ul style="list-style-type: none"> -Use the available road routes and navigation channels if necessary. -Boundary of the construction site must be identified with signs installed. -On the river side, appropriate signs and navigation aids should be placed to define the navigation channel area and ensure navigation safety. -Contractor will coordinate with the Client and supervision Engineers, as well as traffic police to ensure traffic safety is maintained on relevant areas of local roads. -With respect to work in the Rivers, the contractor will coordinate with the Port management agency, the River management sub- stations and the River management stations on the construction area to ensure navigation safety in relevant areas of the river. -At any construction site entry and exit location, there must be a traffic control flagman to control passing vehicles. -Construction vehicles should avoid operating in peak hours of traffic. -All vehicles and vessels should strictly follow road and river traffic law. -Construction vehicles should be properly maintained. <p><i>Traffic monitoring in and out of the site:</i></p> <p>Any impact on public traffic from construction activities must be checked and corrected to minimize the impact on traffic caused by construction vehicles.</p>

	Accident due to construction (Public hazard)	<ul style="list-style-type: none"> -Construction site shall be off-limits to non-workers -Warning signs shall be prominently posted along the site periphery -Disposal sites of contaminated spoils shall also be off-limits to people. -Health screening will be done for workers to prevent spread of disease to the host community; -Use of illegal drugs shall be strictly prohibited in the construction site to prevent spread of HIV disease and other possible social problems. -For navigational safety, the dredging work should be announced in the Notice to Mariners.
	Construction-related accidents (workers)	<ul style="list-style-type: none"> -Workers shall be provided with personal protection equipment. -A first aid station be provided in the construction site -A safety officer shall be designated on site -Workers shall be provided with ample clean water -Sanitary facilities shall be available in the construction site; -An emergency warning system shall be instituted to protect workers from site emergencies and natural hazards. -Evacuation plan for extreme emergency conditions shall be formulated.
		<p><i>Safety and Fire Prevention Plan</i></p> <p>Contractors must strictly follow safety standards according to TCVN 5308 – 91. Specifically:</p> <ul style="list-style-type: none"> -Waterway Safety (Regulations on signals and signs for inland Waterways 22TCVN 269-2000). -Road safety. -Safety in operation of a disposal site; -Safety protection measures required for Waterways activities. -Ensure that all works, equipment and

		<p>installed machinery does not result in dangerous conditions for the Waterways and roadways.</p> <p>-All tasks and activities are planned and coordinated according to requirements from the Project Manager.</p> <p>-Implement instructions from Waterways and road authorities.</p> <p>-Dredging locations should be fully identified and traffic controlled using buoys and lights to ensure vessels can operate.</p> <p>-Any lifting equipment and cranes should be located on the ground with solid structure or on a floating system with sufficient pressure bearing capability.</p> <p>Contractors must possess the following types of insurance:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insurance for all risks in construction <input type="checkbox"/> Insurance for laborers <input type="checkbox"/> Insurance for responsibility of the third party <input type="checkbox"/> Insurance for vehicles, equipment <p>-When floods or storms occur, all works must be supported and protected properly. Bank protection or temporary road sections must be secured and covered properly.</p>
	<p>With Environmental Problems a) Storms and tropical Low Pressures; b) Sedimentation, Erosion and Land Slide; c) Drought and Hot Temperature, and; d) Earthquake.</p>	<p>Optimum options will be considered in compliance with the Vietnamese/International Design Codes and Standards.</p>

Cumulative Impacts

Apart from the World Bank-financed activities under NDTDP, the Ministry of Transport or other government agencies at the Provincial and local level have no additional existing or planned activities in the Project area that would have a negative cumulative impact on Valuable Ecological Components

relevant to Project activities – namely, water quality, aquatic biodiversity, and the quality of life of agricultural communities in the Project area and downstream.

The environmental impact of the DNC Canal Project itself has long term positive environmental impacts. The Project will adopt an innovative ecological engineering approach. A mixed bank protection scheme is proposed for the Project, based on ecological bank protection (vegetation capacity to fix the banks) and classical bank protection (rip rap), which will enhance biodiversity and protect against the effect of waves and erosion on the river banks and adjoining wetland, creating and/or restoring approximately 9 ha of aquatic and wetland habitats— an area 18 times greater than the lost habitat. Moreover, the transfer of a significant portion of dredged/excavated material to Lach Giang’s Southern Disposal area will expedite the filling (and subsequent closure) of the disposal site, allowing for the plantation of income generating Casuarina trees on 30 ha of the disposal site. During the tree maturation period, this will provide favorable habitat for birds and invertebrates. It is anticipated that these ecological approaches to riverbank protection and disposal site closure – in providing examples of cost-effective and environmentally friendly mitigation solutions – will lead to a positive cumulative impact on “green” construction practices in Vietnam.

All sub-projects under the Parent project are already completed and operational. As such, there will be no additional cumulative environmental or social impacts ensuing from these sub- projects.

Disposal Site Due Diligence

Under the DNC canal sub-project a total of 1,561,000 m³ will be excavated or dredged. The major part 1,549,000 m³ will be excavated or dredged for the Canal and Ship-lock construction. The earthworks for bridge and road will mobilize 11,700 m³ of excavation and 27,800 m³ of soil filling.

There are 3 disposal sites for DNC area: 2 sites belong to 2 brick factories in the project area, namely Duc Lam and Dong Bang, and the third site is the Lach Giang Southern disposal area, which was developed under NDTDP, presented in the Lach Giang EIA of 2013 and approved by MONRE. Thus, the project will use these 3 sites to store dredging/excavating materials in the DNC construction area. All 3 sites have been approved and authorized by MONRE.

- Lach Giang: one disposal area in the Southern portion of the complex was built under NDTDP. This site, which now has the purpose of implementing a casuarina plantation to be financed by the DNC canal sub-project, was built to store dredging materials from the Lach Giang bypass access channel sub-project. Although the Lach Giang project was finished, the dredging materials deposited at the Lach Giang disposal area were not sufficient to fill it up yet. At the moment, it can store from 700,000 to 1,300,000 m³ more. The surrounding area of this disposal facility is the sea and it is located far away (1500m) from the closest residential areas (see the figure below).



- Duc Lam and Dong Bang brick factories: the land for disposal sites are belong factories. The land is borrowed from communes to produce bricks. Surrounding area is far away, 500m, from residential areas.

All 3 proposes sites have been approved and authorized by MONRE.

Ferry Relocation

PMU-W has consulted the Department of Transport in Nam Dinh province and local authorities on the project impacts on Do Muoi ferry during construction of the DNC canal. The related parties have agreed to temporally relocate the ferry 50m to the south along the left bank of Day River. The relocation will be completed prior to construction to ensure the operating continuity of ferry. After dyke construction completion, the ferry will be restored to its current location under the same or improved conditions as it currently has. The local authorities and public will not have to pay any ferry relocation related cost, which will be borne by the project under the contractors' packages. All related civil works of relocation and construction of the ferry will be done by the project's contractors. The cost for ferry relocation and construction is therefore under the project's cost.

Currently, the technical plans for relocation and new construction to Do Muoi was provided by Design Consultant and has been approved by MOT.

Operation Phase- Operation / Use and maintenance of the improved channel

Project Phase/Activities	Impacts	Mitigation Measures
Operation Phase- Operation /Use and maintenance of the improved channel	Impacts on air and water quality and tourist destinations; channel bed sedimentation by alluvial transportation and sand transportation activities on the channel; sunken vessel accidents, shocks and oil spill	<p>a) Mitigation measure to minimize air pollution</p> <p>-The MOT in coordination with the MONRE should strictly impose the Vietnamese Standards on Ambient Air Quality</p> <p>b) Mitigation measure to lessen Erosion and Deposition</p> <p>-Installation of navigation aids and advisory/signs.</p> <p>c) Mitigation measure to minimize water pollution</p> <p>MOT, PMU-W in coordination with the MONRE should strictly impose the regulations relative to waste disposal in the water bodies. Operators and owners of water transport should be provided with seminars/training for them to be aware of the negative impacts of such practice.</p> <p>d) Mitigation Impacts on Protected Areas</p> <p>The Waterways transport operators should be provided with environmental awareness training by the PMU-W in coordination with the MONRE.</p>

7. PUBLIC HEALTH AND SAFETY MANAGEMENT PLAN

Public health impacts are mainly generated during the civil works phases and especially during dredging/excavating activities and are considered having negative effects on individual people in particular and in general public. In general, the dredging/excavating will generate suspended materials, dust and noise, affect the aesthetic, could hinder transportation sector. The operation of dredging/excavating, dredged mud attitudes may conflict with the objectives of land use around and can cause harmful effects on health and safety for workers and communities.

Beside, workers may get accidents when working at site. Their lives and property may be affected if accidents happen. The accidents are related to equipment operation or public problem caused by project construction. Ship navigations can also cause Waterways accidents or sinking.

The purpose is to avoid or strongly reduce these negative impacts to the workers and community. Solutions to minimize public health impacts and to ensure safety are necessary:

- Inform the local authority about the schedule of executing work;
- Information and training session about labor risks to the workers by contactors authority under control of consultant;
- Monitoring surface water and air quality in the executing areas;
- Restrict entering into the site without responsibility
- Conduct periodic health examination for workers to charge the spread of infectious diseases local population;
- Contractor ensure about life and injuries for workers.
- Workers are provided with knowledge on construction safety and labor protection equipment.
- Prior to construction, determine the local health
- Department in order to treat quickly of occupational accidents
- Equip medicine cabinet at the site.
- Ensure drink water quality and construct toilet
- Supervise observation working safety during construction.
- Construction site shall be off-limits to non-workers, warning signs shall be prominently posted along the site periphery;
- Disposal sites of contaminated spoils shall also be off-limits to people. An IEC will be implemented to inform the host community of such activity and warning signs will be posted.
- Health screening will be done for workers to prevent spread of disease to the host community;
- Use of illegal drugs shall be strictly prohibited in the construction site;
- HIV prevention will be organized;
- Check regularly the domestic water quality using for workers

The site Health and Safety Officer (HSO) of Contractor is responsible monitoring the compliance with health and safety of workers plans:

- The plan for the health and safety;
- The presence of security personnel in the project area;
- Providing first aid medicine cabinet meeting spot in the project area;
- Purchase of insurance for workers.

The monitoring progress depends on the plan and preparation of construction of the contractor

7.1. Plans for labor safety, community safety and community relations

a. Purpose

- Minimize the risk and trouble in the process of construction dredging
- Ensure the standards of occupational health and safety of staff working at site and local community

b. Content

To ensure that workers and local people are safe in the implementation process of construction, the solution of human health and safety done by contractor include:

1. Training workers following Circular 37/2005/TT/BLDTB&XH. Introduce TCVN 2289-78: The process of production - General requirements for safety, mining TCXD 66-1991 Operating water supply systems. Safety requirements TCVN 3254-1989 Fire Safety - General requirements for safety and explosion, TCVN 3255-1986 - General requirements, TCVN 5699-1:1998 IEC 335-1:1991 Safety of electrical equipment and appliances similar electrical equipment.
2. Promulgate and populate construction site rules.
3. Provide workers with individual protective equipment and clothing (gloves, masks, hard hats, boots, life buoy ...) and collective protection means, satisfying standards TCVN 1841-76 Report manual labor protection leather, artificial leather and canvas, TCVN 2607-78 work wear clothing. Work environment satisfy Decision No. 3733/2002/QD-BYT about promulgating 21 occupational health standards.
4. Before construction, identifying the local clinics to treat quickly when accidents happen. Equipped with individual medicine cabinets within the site
5. Workers must be provided with fresh water. Drinking water must comply with standards TCVN 6096-2004 for bottled water. Tap water satisfies drinking water hygiene standard, issued together with Decision No. 1329/QD - BYT dated 18/4/2002 of the Minister of Health.
6. Provide adequate sanitary facilities including bathrooms, toilets (with septic tank) for the workers at the construction site.
7. Provide and install adequate firefighting equipment and fire extinguishers on site. Ensure fire safety equipment is available at all working place and the fuel storage areas

8. Provide first aid equipment for the temporary office of the contractor.
9. Appointing officer responsible for safety at site.
10. Electricity plugs used outdoor will be water resistant or protected from water splashing;

The solution of public health safety done by the contractor will include:

1. There are clear signs for the temporary replacement or bypass road.
2. The hazardous materials (including gasoline and oil) should be stored and fuel transportation and feeding will be conducted without leakage.
3. Ensure that all do not leak oil seep into the ground.
4. Site officers will supervise occupational safety and all issues related to waste management every day. The contractor will contact local authority of the appropriate location for building a bypass road if offered.
5. In case of heavy rain or emergency, the contractor will suspend all work. In risk of flood, the workers must be informed as fast as possible and evacuate if river water level presents a risk for people. To prevent accident and pollution, all sensitive/dangerous equipment and materials evacuate outside of flood influence.
6. If the pipe installation work caused disruption to existing infrastructure, resources or public services, the contractor will inform the community at least a week earlier. When the dredging is completed, the contractor will restore all positions as soon as possible.
7. All of the labor force must comply with the regulations and laws of Vietnam.
8. The following activities at or near the dredged area will be prohibited: use of illegal substances, weapons, guns, beating, disorderly public areas, disrespectful attitude to the media and local practices, use of alcohol during working hours, only allow smoking in specified areas.
9. The Contractor shall notify the users of river water for drinking, agriculture and aquaculture activities of the land surrounding at least a week before dredging and address any concerns to satisfy the requirements of supervision.
10. Any problems that occur must be solved and recorded by managers.

The solution of safety for workers done by the contractor will include:

1. Regular control of drinking water quality, coming from underground water pumping will be organized by contractor/subcontractors;
2. Individual protection equipment (safety shoes, helmet, gloves, eyes/ears protections, lifejacket and/or any other needed) adapted to workers' tasks will be provided by the contractor/subcontractors to every employee working on site. Contractor/subcontractors will

ensure the workers wear the adapted protection equipment and know how to use them. Priority is given to collective protection means when possible;

3. Safety rules/recommendations will be permanently screened on site and on boats and explain to the workers. Frequent training sessions must be organized by contractors and consultant can check the effectiveness of these training sessions;
4. Fire prevention: it's necessary to equip fire and explosion preventing devices and check every 3 months;
5. Health: Equip medicine cabinet at the site. It needs to check, replace expired medicines and supplement new ones.

c. Time and frequency

Work safety, community safety and community relations are prepared at least one week before execution and inspected, performed daily

7.2. Plans for medical management and controlling social and cultural issues

a. Purpose

Minimize the disturbance of society and bring the greatest benefit to the community.

b. Content

The following tasks will be done by the contractor:

1. The Contractor shall contact the local community to determine the important historical or cultural locations to avoid damage to the area.
2. The Contractor shall have an agreement with local communities on the evaluation and use of local resources.
3. The Contractor shall limit the dumping wastes and the waste management near the garden, fields and water sources.
4. Perform public consultation with the local community affected by waste dumping activities.
5. In case of mud and water spilling into the environment from waste dumping site, the contractor will implement measures to stop the problem and work with local authorities to compensate the damage.
6. Combined with local authorities to organize awareness programs on communication and social evils can be had from the construction camps. Update knowledge on HIV/AIDS for the collective of workers in the field.
7. And local communities to be informed to know the dredging will affect water supply and agricultural production, in particular by handing out flyers for the residents living along the river have two projects going through and stuck in road works.

8. During construction, avoid forming waterholes, changes in landscape, the contractor will install the signs if any.
9. Waste dumping site will be fenced off and isolated from the surrounding area. The consultation process detailed notice to the parties concerned.
10. The dredged area must be kept to a minimum; The contractor will limit all activities, materials, equipment and their personnel in the dredging area.
11. Place warning signs for speed limit, before and after dredging area and traffic adjustment.
12. Set the table indicate the basic information about the project written in language understandable to local communities in the dredging field.
13. Regularly check the boundaries of the site.
14. Ensure that no worker do fishing with nets, mines, or electrical impulses.
15. Prohibit consumption of wild animals/wild animal products.
16. No pets allowed at construction site.
17. Any problems and complaints must be recognized and resolved immediately. The settlement is also recorded.

c. Time and frequency

- The management of regional health and controlling of social and cultural affairs is done regularly.

7.3. Plans for traffic safety improvement

a. Purpose

- Minimize the impact on existing transport system

b. Content

The contractor's plan to limit the impact on traffic in construction areas are as follows:

1. Create a temporary travel conditions for local people.
2. Contractor will restore roads after completing construction.
3. The contractor will have construction plans efficient and timely.
4. The Contractor shall notify the local community working schedule.
5. Installation of signage for road construction in the area.
6. Installation of the signs of the area under construction.
7. In case of working at night, the contractor will install the lights
8. Inform local people plan and authority plans for regulating water transport.

Contractors always perform and supervise the work reasonably regulate traffic. Limit transportation of materials on the existing roads at rush hours.

In case of traffic incidents, combine with local authority and investors to settle.

c. Time and frequency

Ensure the transport safety is done every day.

7.4. Prevention overcoming incidents*a. Purpose*

- Prevention and rapid response to incidents occurring at site.

b. Content

During construction, the Contractor will prepare a contingency plan of incidents:

1. Introducing management plans for oil, dredging sludge for all individuals associated with the use of and transportation;
2. Oil must be stored properly and have warning signs;
3. Notify supervision of any incident or oil spill unplanned;
4. Planning for emergency response which clearly states the steps to apply in case of unexpected spill or discharge;
5. To conduct remedy after spill incidents;
6. Submit a report showing incidents spill causes, remedial measures were implemented, the consequences/damage due to spillage and the proposed processing operation. Emergency plans for oil spills.
7. Maintenance dredging equipment (maintenance is prohibited to be done at site, but at workshop).
8. When pumping at alum bags, the contractor pause all activities quickly, blocking the river level near candy bags for prompt treatment, not affect the production and economic health of the people.
9. Measures to discharge contaminants will depend on the extent and type of contamination. The fuel chemical lubricants during construction on the banks overflowing, to quickly localize the contamination, a trench around a contaminated site to collect water and pump oil and other contamination, then use a chemical to handle.
10. Explosives - fuel, chemicals, etc., contractor train staff and workers at the construction site to timely treatment.
11. Leaking and broken incidents to dumping site: When the tank dumps broken leading to overflow of sludge into agricultural land, dirty water leach out causing damage to people's production and pollution the water source, the contractor will stop the pouring of the ground and quickly dumps reinforced dumps, put some PVC membranes prevent leakage through the wall. Use of equipment for collecting spilled mud dump pollutants cause damage to people and negotiate and compensate for damage according to the provisions of the state.

12. Contractor report and coordinate with investors, consultants and local to have best solution to reduce the losses, the impact occurs at the lowest level.

c. Time and frequency

- The prevention is closely monitored daily and fix immediately of the incident

7.5. Plans for training human resource

a. Purpose

To ensure staff resources to meet the demand of professional and environmental issues at site.

b. Content

To meet the requirement of human resource, the contractor will hold training sessions as follows:

1. Training personnel in environmental management and occupational safety before entering construction site.
2. Training on HIV/AIDS, STD (sexually transmitted disease) to workers;
3. Workers are informed about safety procedures during construction.

c. Time and frequency

The training is made before construction

8. ENVIRONMENTAL SUPERVISION FRAMEWORK

Environmental supervision is a process to ensure project-related construction activities are completed in compliance with the Government of Vietnam’s regulations and mitigation measures as outlined in the EIA and EMP. With respect to the PMU-W, supervision is required primarily during construction activities.

8.1. Construction Supervision Framework

Construction supervision is a daily process whereby a designated individual or group provides oversight to the Contractor and sub-contractors to ensure that environmental commitments identified within the EIA and EMP are complied with (Figure 5, see also Annex C).

Enforcement shall be completed through the Contractor’s Terms of Reference for Construction and Camp Management (Annex A) and contractual clauses relating to socio-economic and environmental performance.

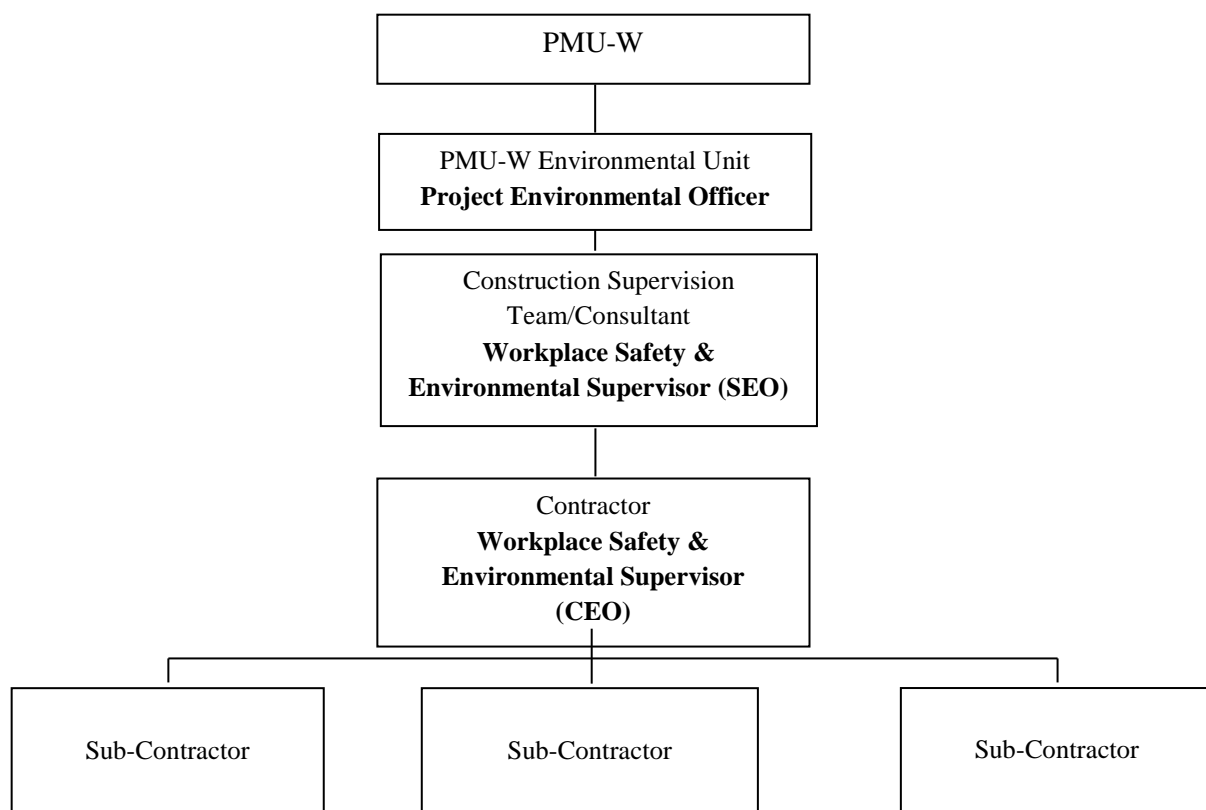


Figure 4: Environmental Organization Structure for Corridor 3

8.2. Construction Supervision – PMU-W and CSC Environmental Unit

The PMU-W shall be responsible for ensuring that:

- EMP/EIA provisions are incorporated into contractor documents;
- Adequate resources and personnel are in place to supervise EMP/EIA performance;
- Contractor and all sub-contractors comply with EMP/EIA regulations on a daily basis;
- Audits or compliance reviews are completed on a scheduled basis and the results provided to either the World Bank or Government of Vietnam; and
- All monitoring resources are properly implemented and data is adequately recorded for reporting purposes.

The Project Environmental Officer (PEO) will represent the PMU-W for environment-related matters and will be responsible for ensuring the EIA and EMP mitigation measures are employed. He/She will also lead the Corridor 3 Environmental Unit.

The Workplace Safety & Environmental Personnel of the Construction Supervision Team (CST) or Construction Supervision Consultant (CSC) will be responsible for supervising and monitoring all construction activities. The CST or CSC will be equipped with:

- Workplace Safety and Environmental Supervisors (SES) – Individuals knowledgeable in environmental management, supervision and monitoring within environmental legislative requirements in Vietnam who will provide day to day oversight; and
- Environmental Engineers – Individuals who will supervise Contractor's performance.

8.3. Construction Supervision – Contractor Responsibility

The Contractor (and sub-contractors) shall organize representatives within an Environmental Team (ET), which shall be led by the Workplace Safety & Environmental Officer (SEO). Jointly, the ET and SEO shall ensure construction activities abide by EMP/EIA requirements.

Details on roles and responsibilities are provided in the Construction Camp Management Plan (Annex A). Table 8 describes the supervision framework for overseeing environmental and socio-economic parameters for the construction of Corridor 3.

Table 8. Construction Supervision Framework

Issue	Location: <i>Where is the issue?</i>	Parameter: <i>What is being overseen?</i>	Procedure: <i>How is the issue managed?</i>
Noise	Construction site Project –adjacent communes	Level of noise being generated during construction (every hour and daily bases) Frequency of disturbance to local villagers	Audio-Visual observations Report forms Monthly reporting to PMU-W, local authorities, as required
Dust	Construction site Access Roads	Concentration of dust generated during construction activities Exploitation of water resources for spraying	Daily observations Incident reporting Monthly reporting to PMU-W, local authorities, as required
Management of hazardous materials (fuels, lubricants, explosives, etc.)	Hazardous materials storage site	Storage facility location, security and maintenance	Inventory checklists Reporting incidents or accidents Quarterly reporting to PMU-W, local authorities, as required
Solid waste	Designated landfill Construction site Camp sites	Amount of waste generated at construction and camp sites Amount of waste disposed at the landfill Recycling of material Littering and contamination of environment	Waste tracking sheets or register Incident reports Monthly reporting to PMU-W, local authorities, as required
Sewage waste	Construction site services Camp site services	Quantity and quality of sanitation services provided Misuse of sanitation services Inappropriate disposal of human waste	Daily checklists Incident reports Monthly reporting to PMU-W, local authorities, as required

Issue	Location: <i>Where is the issue?</i>	Parameter: <i>What is being overseen?</i>	Procedure: <i>How is the issue managed?</i>
Potable Water	Construction site Camp site	Misuse of water reserves Misuse of natural water sources Contamination of water resources	Daily checklists Incident reports Monthly reporting to PMU-W, local authorities, as required
Construction equipment and vehicle maintenance	Construction site Vehicle/equipment storage area Access roads	Vehicles/equipment operating at standard levels Excess oil, fuel, lubricant leaks and gas emissions Disorderly conduct or misuse of equipment / vehicles	Daily checklists Incident reports Quarterly reporting to PMU-W, local authorities, as required
Worker Code of Conduct and Safety	Construction site Camp site	Safety, security and orderly conduct of construction workers Accidents and unplanned events Conflict with local villagers	Environmental and safety meetings held regularly Incident report forms Quarterly reporting to PMU-W, local authorities, as required

9. ENVIRONMENTAL MONITORING FRAMEWORK

The NDTDP Phase 2 Environmental Monitoring Framework outlines the responsibilities of the PMU-W and the Contractor to monitor the environmental and social mitigation measures of the project area and to ensure it is implemented in a manner that is compliant with Vietnamese government regulations and EIA/EMP commitments.

9.1. Monitoring Objectives

The objectives of the Environmental Monitoring Framework are:

- To ensure project components are conducted in compliance with the Government of Vietnam's laws and regulations and approval conditions of the EIA;
- To measure the success of proposed mitigation measures in minimizing and/or reducing potential environmental and socio-economic impacts;
- To continue baseline monitoring of environmental and social conditions;
- To facilitate a continual review of post-construction and operation activities based on performance data and consultation feedback; and
- To implement corrective actions or new adaptive management programs, as required, if proposed mitigation measures are unable to reduce and/or eliminate potential project-related impacts, or meet the predetermined level of performance.

9.2. Monitoring Framework

The monitoring framework is intended to provide guidance on the content of the environmental monitoring procedures and shall not replace any Government of Vietnam standards, regulations or laws that are mandatory during construction and operation activities. It is also recommended that the PMU-W consider creating their own internal databases or registries to collect, document and present records as required.

Monitoring shall start as soon as the project is given the go-ahead, and monitors shall be ready to be mobilized prior to the onset of construction activities. Monitoring shall be implemented throughout all project phases and managed by the PMU-W. The PMU-W will also be responsible for ensuring that the surrounding environment and social communities are protected throughout the life of the Corridor 3.

Detail monitoring network of Noise, Air and Water is shown in **Annex B**.

9.3. Construction Phase

Monitoring during the Corridor 3 construction phase will have two principle phases:

- Implement systematic observations to periodically measure the success of proposed mitigation measures; and
- Continue data collection in order to compare baseline environmental conditions with conditions during construction and operation.

The majority of construction monitoring shall be done visually and verified by the Construction Supervisor. Checklists shall be conducted to identify potential environmental and social issues early. Proper courses of actions shall be proposed if any proposed mitigation measures are not in compliance with Government of Vietnam regulations or unable to properly reduce and/or eliminate environmental and/or socio-economic impacts.

The Contractor's Environmental Officer (CEO) will be responsible for carrying out environmental sampling and monitoring on all environmentally related issues regarding the Construction Contractor's activities. The CEO will review, verify and validate the performance of environmental mitigation measures and identify those issues that require additional review and management adjustments.

Monthly reports shall be issued to the PMU-W and where required, the World Bank, to summarize construction activities, document those that require amendment and to identify whether or not remedial actions are needed.

Table 9 identifies the monitoring activities to carry out during the Construction Phase.

Table 9. Construction Monitoring Plan Framework

Issue	Responsibility: <i>Who will monitor?</i>	Duration: <i>When is monitoring done?</i>	Parameter: <i>What is being tracked?</i>	Location: <i>Where does monitoring occur?</i>	Procedure: <i>How is the issued or recorded?</i>
Noise	PMU-W	Daily observations	Frequency of disturbance to local villagers Requirement for sound barrier installation	Construction site Adjacent communes	Auditory or with portable noise monitoring equipment Reporting forms Monthly reporting
Air quality	PMU-W	Monthly tests	Amount of dust generated Requirement for spraying roads, site to control dust and water supply	Construction site Access roads	Visual and air sampling Laboratory testing Reporting forms Monthly reporting

Issue	Responsibility: Who will monitor?	Duration: When is monitoring done?	Parameter: What is being tracked?	Location: Where does monitoring occur?	Procedure: How is the issued or recorded?
Water quality	PMU-W	Monthly testing	Water quality standards in construction and camp sites (BOD, pH, COD, TSS, dissolved oxygen, temperature, Coliform, etc.)	100 m Upstream and 200-500 m downstream from the dredging area and civil work	Water sampling Laboratory testing Monthly reporting
Water resources	PMU-W	Monthly testing	Amount of water available for construction site, camp site and resettlement communes	Water reserves and resources Construction and camp sites Project-affected communes	Monthly reporting Consultation with project-affected communes
Sedimentation and erosion	PMU-W	Monthly	The number of erosion and sedimentation sites and rates (including new forming sites)	1000 m downstream from civil work	Visual observations Daily environmental checklists Monthly reporting
Aqua Flora and Fauna	PMU-W	Monthly	plankton, zooplankton and benthic organisms	Dredging and disposal areas and groin	Visual observations Sampling test Laboratory test Monthly reporting
Culturally significant vestiges/ruins or sites discovering	Contractor PMU-W	Daily, as required	Accidental discovery of culturally significant vestiges or site	Excavation sites Borrow sites Construction site	Visual Implement Chance Find Procedures

<i>Issue</i>	<i>Responsibility: Who will monitor?</i>	<i>Duration: When is monitoring done?</i>	<i>Parameter: What is being tracked?</i>	<i>Location: Where does monitoring occur?</i>	<i>Procedure: How is the issued or recorded?</i>
Auxiliary project components (roads, transmission lines, etc.)	Contractor		Road traffic and associated issues (noise, dust, displacement of people, etc.)	Access roads Transmission line areas	Visual Refer to other sections for additional information (ie. Noise, Dust, etc.)
Resettlement of affected people and land compensation	PMU-W	Throughout Pre-construction	Payment, grievance, employment... level of compliance with RAP	Resettlement communes	Consultation with resettled households to ensure successful relocation of communes Reporting forms for incidences and grievances Database creation to track individuals and social impacts Monthly reporting

9.4. Operation Phase

Air Quality: Vessels plying the Corridor 3 should be tested for emissions at least once year. This should be a pre-condition to the issuance of certificate of seaworthiness. The emissions tests can be done by an Environmental Center with capability for emissions testing.

Water Quality: Random sampling of bilge water of boats should be done. Sampling should be done by ports authority and reported to PMU-W. Bilge water should be analysed for mineral oil, Pb, Cr, As, Hg, Cr, Fe, Al.

Compliance with imposed speed limits: Monitoring of vessels compliance with imposed speed limits should be done in segments of the river that are highly susceptible to bank erosion.

Monitoring of Maintenance Dredging

Water Quality: Water quality monitoring should be done once before maintenance dredging commences and once after the completion of the dredging work.

Sediment Quality: As in monitoring during construction, similar monitoring protocols should be observed. Stream Sediment quality should be analyzed prior to maintenance dredging and once after completion of the maintenance dredging.

Biological Monitoring: Monitoring for plankton and benthic communities shall be done after dredging to assess recovery of such affected species. Estimate of cost will depend on the monitoring program during operations.

10. COMMUNICATION AND REPORTING

The following section describes the communication and reporting mechanisms to be implemented as part of the EMP.

10.1. Communication Process

Table 10 describes the lines of communication for construction workers, local villagers, employees and other project-related individuals with respect to filing grievances or incidences throughout the construction and operation of the Corridor 3.

Table 10: Communication Pathway

Stakeholder	Potential Interest / Concern	Means of Contact	Key Contact
Local villagers (displaced, resettled, downstream water user)	<p>Adequate compensation package (financial assistance, food cache, water reserves, etc.)</p> <p>Disturbance from construction camp and associated activities (drugs, alcohol, prostitution, disease, etc.)</p> <p>Loss of productive lands, fisheries, etc.</p> <p>Access to community services (medical, education, telephone, market, etc.)</p>	<p>Complaints/concerns shall be communicated to local village leaders and authorities</p> <p>Information broadcasts and project updates shall be provided by the Contractor to local village leaders</p>	Social Safeguard Team of PMU-W

Stakeholder	Potential Interest / Concern	Means of Contact	Key Contact
	Maintenance of cultural heritage Safety and security of local villages and communes Project updates Information broadcasts on potential hazards (blasting, road closures, reduced river access, etc.)		
Potential employees	Employment opportunities Adequate resources (food, water, etc.) and shelter Competitive wages	Recruitment of locals at the project site and through word of mouth Issues shall be conveyed to site foremen	Contractor
Government stakeholders	Chronic environmental and socio-economic impacts	Monitoring Committee	PMU-W
Construction workers and camp sites	Workers code of conduct Social conflicts between local villagers and workers Behavior issues (gambling, drugs, etc.) Environmental issues (exploitation of natural resources, etc.)	Weekly meetings with construction workers Individual meeting with disorderly workers	Contractor

10.2. Reporting

Reports shall be produced through the course of implementation of monitoring programs, collecting incident/grievances forms, consulting with local villages and project-affected communes and auditing performance of existing programs/mitigation measures within the EIA and EMP. Table 11 describes the types of reports that shall be produced.

Table 11: External Reporting Schedule

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
Contractor & Workplace Safety and Environmental Officer	Accidents/Incident Report	Filing/notification of accidents or unplanned events	Within 24 hours of the incident	PMU-W/CST
	Non-compliance Report	Detail the cause, nature and effect of any environmental and/or socio-economic non-compliant act performed	Within one week of the event	PMU-W/CST
	Chance Discovery Report	Documentation and registry of newly discovered artefacts	Within 24 of archaeological site, old human remains or artefact	PMU-W/CST Government Ministry
	Monthly Compliance Report	Report to the Construction Supervision Team	Report of compliance and non-compliance measures on a monthly basis	CST
Construction Supervision Team	Daily Compliance Checklist	Checklist of environmental and social compliance of construction	Daily	Internal
	Monthly Compliance Report	Monthly report of compliance within 10 days of receipt of report from Contractor	Monthly	PMU-W
Project Environmental Officer &	EMP updates, including any changes in	For approval prior to implementation	As required, prior to implementation	PMU-W

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
Independent Environmental Monitoring Consultant	management or monitoring procedures			
	Key changes in project activities that may trigger Environmental Approvals	Ensure compliance with environmental regulatory approvals	As required, prior to implementation	PMU-W
	Environmental monitoring reports	Notification of non-compliance with standard environmental guidelines and parameters	Dependent on environmental parameter: weekly, monthly, quarterly or annually	PMU-W

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
Social Safeguard Team of Project Management Board	Resettlement Development Plan	Ensure resettled transition successfully into resettled sites	On-going	PMU-W, MOT, World Bank

The PMU-W will provide the World Bank with report updates. Frequency of reporting to the World Bank will vary depending on the nature of the non-compliance and monitoring schedule.

11. CAPACITY BUILDING AND TRAINING

Environment management of inland Waterways projects is relatively a new task for Vietnam Transport Sector. Ministry of Transport through the Project Management Unit of Waterways (PMU-W) will establish an Environmental Unit (EU) to oversee the preparation, implementation and oversight of the EMP and its associated plans. It is essential that capacity building and training be provided for the members of the EU and other staff who will be involved in the implementation of the EMP prior to project implementation. The objective of the training is to familiarize the management staff with environmental management and procedures for environmental monitoring and reporting. The training can be conducted by one of the environmental centers involved in environmental impact assessment and environmental management.

11.1. Project Management Unit of Waterways

The training will cover, among others, the following subject matters:

- a) Environmental Regulations and Standards of Vietnam
- b) Principles and procedures for environmental impact assessment
- c) Fundamentals of environmental management
- d) The Environmental Management Program for NDTDP Phase 2
- e) Environmental issues related with Waterways improvement and operation
- f) Environmental monitoring methods and procedures
- g) Environmental Reporting (includes report preparation and interpretation of laboratory results)

11.2. Construction engineers

The following training programs will be provided for engineers of the contractors:

- a) Principles and procedures for environmental impact assessment;
- b) Fundamentals of environmental management;
- c) Environmental Management Plan of the Project: Orientation of engineering staff on the environmental management plan for NDTDP Phase 2 particularly the following:
 - Air, noise, soil and water sampling procedures;
 - Fundamentals of aquatic ecology
 - Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
 - Waste management;
 - Fuel and hazardous materials management;
 - Construction camp management;
 - Community relations and public consultation procedures;
- d) Labor Safety: Regular training on safety issues related to the river works and dredging;
- e) Monitoring and reporting of EMP: The training will include the methodology for site observation and reporting of monitoring results.

11.3. Capacity building and training cost**Table 12: Indicative Estimated Cost for Training Activities**

No.	Training	Items	Estimation	Cost (VND)
1	Training for PMU staffs (in the Pre-Construction phase)	Above mentioned topics of training		
2	Safety training (in the Construction phase)	Consultant's manpower requirement		
		Per diem for 40 participants		
		Other expenditures: classroom, stationery		
3	Training on environmental protection related to inland water (in the Construction phase)	Consultant's manpower requirement		
		Per diem for 40 participants		
		Other expenditures: classroom, stationery		
4	Training on environmental monitoring and reporting (in the Construction phase)	Consultant's manpower requirement		
		Per diem for 30 participants		
		Other expenditures: classroom, stationery		
Total				

12. EMP MONITORING AND REVIEW

The environmental unit of the PMU-W shall periodically review, monitor and audit the effectiveness of the EMP, including all sub-plans. The audit program should adequately cover the scope, audit frequency and methods that are typically required for large infrastructure projects. The frequency of audits should reflect the intensity of activities (typically more common during construction), severity of environmental and social impacts and non-compliances raised in prior audits.

12.1. Review of the EMP

Role of the Environmental Unit

The environmental unit of the PMU-W shall review the EMP to assess its effectiveness and relevance as follows:

- With the assistance of the Construction Supervision Team (CST)'s Environmental Officers, the EU will review and analyze periodic reports (quarterly basis or monthly if necessary) on environmental monitoring to check the status of the contractors' compliance with the EMP.
- With the CST's Environmental Officers, conduct periodic inspection to validate on site EMP implementation.
- Based on the findings from the report and site inspection, or a reportable incident, or a significant non-compliance, up-date or change order to the EMP, or a sub-plan with the assistance of the CST's Environmental Officers.
- A full review of the EMP shall be undertaken annually and the provisions in the EMP may be revised or new ones will be introduced.
- The PMU-W will approve the variations in the EMP for the implementation of the Contractors.

Role of the Construction Supervision Team (Environmental Officers/Engineers)

The environmental unit of the PMU-W shall review the EMP to assess its effectiveness and relevance as follows:

- Review and analyze periodic reports (quarterly basis or monthly if necessary) on environmental monitoring to check the status of the contractors' compliance with the EMP.
- Conduct periodic inspection to validate on site EMP implementation.
- Based on the findings from the report and site inspection, or a reportable incident, or a significant non-compliance, up-date or change order to the EMP, or a sub-plan in coordination with the PMU-EU and the Contractors' Environmental Officers/Engineers).
- A full review of the EMP shall also be undertaken annually and the provisions in the EMP may be revised or new ones will be introduced in coordination with the PMU-EU and the Contractors' Environmental Officers/Engineers).

Review of the EMP by the EU, CST and Contractors Environmental Officers

The review of the EMP should consider the following:

- Adequacy of data collection, analysis and review;
- Reporting;
- Non-compliances and corrective actions implemented; and

The EMP will also be reviewed periodically to evaluate environmental controls and procedures to make sure they are still applicable to the activities being carried out. The full EMP Reviews will be undertaken as follows:

- The full EMP shall be reviewed at least annually;
- Relevant parts of the EMP shall be reviewed following a reportable incident;
- Relevant parts of the EMP shall be reviewed following the receipt of an updated sub-plan; and
- At the request of stakeholders, including MONRE, Contractor, Supervising Engineer, World Bank or the host communities.

The review shall include analysis of the data collection and analysis of data, monitoring reports, incident reports, complaints/grievances and feedback from stakeholders, MONRE reports, and consultation meeting minutes and training records to evaluate the effectiveness of EMP procedures. Site visits, interviews and other auditing methods may also be used. Updates to the plan shall follow the procedure in Section 11.2.

12.2. Control and Update of the EMP

This document will be issued as a controlled document to all concerned staff and organizations. The procedure to be followed to control the issue of the documents, provide a review of its effectiveness and provide updates will be as follows:

- Issued copies by the Environmental Unit of PMU-W shall be numbered;
- The Environmental Unit shall initiate a review of any relevant sections following modification to the EMP
- Environmental Approval, issue of a new approval, receipt of written requirements by MONRE/DONRE, or a change to internal procedures based on corrective actions or improvements in methodologies or analytical procedures.
- The Environmental Unit shall receive all communications from the MONRE/DONRE/Stakeholders and will be in-charge to provide information to all concerned staff and organizations.
- For communication and reporting to be implemented as part of the EMP, responsibilities and schedules are provided in Section 9 of this document.

13. ADDITIONAL BASELINE DATA COLLECTION

Within 6 months before the beginning of the construction phase, it recommended that additional air quality monitoring and noise be undertaken at sensitive sites and consider the previous baseline data in the EIA before construction. Locations and parameter are described in the table below:

Table 13. Additional Air Quality

Project area	Locations	Parameter
DNC canal	Nghia Son commune, Nghia Hung district, Nam Dinh province - Near Do Muoi	TSP, CO, SO ₂ , NO ₂ and Microclimate
	Nghia Son commune, Nghia Hung district, Nam Dinh province - Near ship-lock of Km162	TSP, CO, SO ₂ , NO ₂ and Microclimate
	Nghia Lac commune, Nghia Hung district, Nam Dinh province - Near Ninh Co river of Km163-164	TSP, CO, SO ₂ , NO ₂ and Microclimate

In case the construction is not implemented within six (6) months, all sampling in the environmental components mentioned in **Annex B** be undertaken as the baseline data before construction.

Beside, a salinity survey should be implemented before and during construction and after construction, during operation phase in DNC canal: Day and Ninh Co side on DNC canal entrances and on Quan Lieu canal.

14. IMPLEMENTATION

14.1. Implementation

PMU-W shall assume overall responsibility for the implementation of the EMP as described in the following activities:

- Oversee the Contractor's Compliance with the EMP requirements
- Preparation of management plans
- Formation of an environmental unit
- Training

PMU-W should prepare an implementation plan for the EMP considering the requirements identified in Table 14.

14.2. Schedule

Table 14: EMP Implementation Plan

Implementation Item	Description
Formation of an Environmental Unit	An Environmental Unit shall be formed to implement the EMP consisting of a Project Environmental Officer and required staff for: <ul style="list-style-type: none"> ▪ Construction supervision ▪ Environmental monitoring
Prepare Bid Specifications for Construction Contractor	To prepare environmental and social requirements for the Construction Contractor
Oversight of Management Plans	To oversee the Construction Contractor in the preparation of the following management plans: <ul style="list-style-type: none"> ▪ Environmental Disposal Plan ▪ Socio-economic Management Plan
Preparation of Management Plans	To prepare the following management plans (see Section 2) <ul style="list-style-type: none"> ▪ Environmental Monitoring Plan ▪ Environmental Disposal Plan ▪ Social Development Plan
Training	<ul style="list-style-type: none"> ▪ Develop a training plan outlining training requirements, topics, and areas of capacity building ▪ Identify courses/seminars ▪ Identify staff requiring training ▪ Implement training plan

15. EMP COSTS

Estimated costs for the initial implementation of the EMP are presented below in Table 15. Costs have been defined on an initial set up basis. PMU-W will revise these costs and develop annual operating costs for the EMP.

Table 15: Preliminary Estimate of EMP Costs

EMP Component	Quantities	Estimated Cost (VND)	Estimated Cost (USD)
SEMPs (Contractor – built into contract)	8 contractors	480,000,000	23,300
Environment and Safety Supervision (consultant)	lump-sum	2,255,000,000	109,466
Monitoring from Independent (Included Air/water/Soil/sediment/Salinity and others)	24 months	1,275,899,463	57,416
Monitoring from Consultant (Included Air/water/Soil/sediment/Salinity and others)	lump-sum	3,672,986,603	165,286
Training to Environment protection	lump-sum	62,800,000	3,049
Training to Labor safety	lump-sum	62,800,000	3,049
HIV/AIDS	lump-sum	550,000,000	25,000
Total Initial EMP Costs		8,359,486,066	386,566

REFERENCES

- Feasibility Study Report of Northern Delta Transport Project, Royal Haskoning, SMEC and Centre of VAPO, March 2008;
- Feasibility Study Report of Northern Delta Transport Project, Appendix IIa, Environmental Impact Assessment for Corridor 3, Royal Haskoning, SMEC and Centre of VAPO, March 2008;
- Environmental Management Plan (EMP) of NDTDP – Component A: Inland Waterways Corridor 1, Egis BCEOM International, September, 2010;
- Environmental Impact Assessment (EIA) of NDTDP – Component A: Inland Waterways Corridor 3, CNR-VIPO Consultant, November, 2012;
- Environmental survey report of NDTDP – Component A: Inland Waterways Corridor 3, CNR-VIPO Consultant, June, 2012;
- Environmental Disposal Plan of NDTDP – Component A: Inland Waterways Corridor 3, CNR-VIPO Consultant, November, 2012;
- Resettlement Assessment Plan (RAP) of NDTDP – Component A: Inland Waterways Corridor 3, CNR-VIPO Consultant, September, 2012;

ANNEX

A-1: MANAGEMENT PLAN OF WORKFORCE AND CONSTRUCTION CAMP

Workforce

Workforce includes all personnel hired by the Contractors to work in the constructions, rehabilitation or improvement of roads. The workers shall, whenever possible, rent houses nearby. Otherwise, suitable accommodations will be provided for the workforce. Workers' camps will be located at appropriate areas away from villages, schools as well as rivers course to minimize the impact of river blocking.

The Contractors shall:

- Allocate staff responsible for project environmental issues including receiving and addressing of complaints from communities
- Install signboards, warning signs in the vicinity of construction works. Where dredging or disposal site is within 500m from a village, fence to separate the sites is also required.
- Contractor is encouraged to hire local labor to carry out simple manual works
- Provide adequate protective equipment to workers such as gloves, hard hats, boots etc. and enforce the usage
- Announce for the position that local labor could participate in the works to every villages along the road;
- Engineers and workers shall register their temporary residence with the local authority;
- Provide work safety training to those local labors upon their hiring;
- The construction workers and staff shall need to have appropriate certificates as required (for example: health checks, labor contracts, insurance, occupational safety training, etc.);
- Establish a Code of Conduct to outline the importance of appropriate behavior, drug and alcohol abuse, respect for local communities, and compliance with relevant laws and regulations. Each employee shall be informed of The Code of Conduct and bound by it while in the employment of the PMU or its Contractors.

Workers' Camp and Site Installation

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

- Camps shall be located in appropriate areas as agreed by local authorities and not within 500 meters of existing residential settlements. Camp facilities should not be located in steep slopes; Camp areas shall be located to allow effective natural drainage;
- The workforce shall be provided with safe, suitable and comfortable accommodations. They have to be maintained in clean and sanitary conditions;
- Potable water safe for human consumption shall be provided for at camps, site offices, and other areas;
- A medical and first aid facilities and first aid boxes shall be provided in each construction camp site;

- Security measures such as adequate day-time night-time lighting shall be put into place at the dredging site and a perimeter security fence at least 2m in height shall be put in place surrounding the disposal sites where nearest residential house is within 500 m from the site;
- They shall be provided with personal protection equipment such as gloves and goggles, hard hat, safety shoes, masks when necessary
- A first aid station with a trained emergency first responder shall be provided in the construction site;
- A safety officer shall be designated to enforce safety regulations in the construction site;
- Hygiene facilities shall be available in construction site;

Prohibitions

The following activities are prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;
- Hunting, fishing, wildlife capture, or plant collection;
- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
- Disturbance to anything with architectural or historical value;
- Use of firearms (except authorized security guards);
- Use of illegal drugs
- Use of alcohol by workers in office hours;
- Washing cars or machinery directly in river;
- Doing maintenance (change of oils and filters) of cars and equipment outside authorized areas;
- Disposing trash in unauthorized places;
- Driving in an unsafe manner in local roads;
- Working without safety equipment (including boots and helmets);
- Use of explosive materials or chemical for fishing;
- Latrine outside the designated facilities; and
- Any construction worker, office staff, Contractor's employees or any other person related to the project found violating these prohibitions will be subject to disciplinary actions that can range from a simple reprimand to termination of his/her employment depending on the seriousness of the violation.

A-2: SOCIO-ENVIRONMENTAL IMPACT MANAGEMENT

In order to avoid negative impacts in the project area, the Contractor shall carry out the following activities:

Erosion and Sedimentation Control:

- The Contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent storm water from concentrating in streams and scouring slopes, banks, etc.
- Areas of the site not disturbed by dredging or disposal activities shall be maintained in their existing conditions;
- Apply erosion control measures before the rainy season begins preferably immediately following rehabilitation;
- Install sediment control structures where needed to slow or redirect runoff and trap sediment. Sediment control structures include windrows of logging slash, berms, sediment catchment basins, straw bales, brush fences, and silt;
- Spray water as needed on dirt roads to reduce wind-induced erosion;
- Traffic and movement over stabilized areas shall be restricted and controlled, and damage to stabilized areas shall be repaired and maintained to the satisfaction of the Construction Supervisor

Water Quality Control:

- Construction vehicular and equipment must be maintained regularly in workshop, not at the site
- Chemicals, fuels/oil will be stored in covered areas with concrete floors and bonds and at least 100m from any water body
- Ensure that construction camps have adequate sanitation facilities

Gas emission and dust control:

- The Contractor shall be responsible for compliance with relevant Vietnamese legislation with respect to ambient air quality;
- Selection of alignment of access roads to the disposal sites should take into consideration the presence of residences. As much as feasible, temporary access roads should be in places that are unpolluted or sparsely populated.
- The Contractor shall implement dust suppression measures (e.g.. water spray vehicles, covering of material stockpiles, etc..) if and when required;
- Construction vehicles shall comply with speed limits and haul distances shall be minimized;
- It is encouraged to use vehicles and machinery which would cause less pollution like gasoline without lead. Limit the use of materials which may have high risk of pollution such as coal and black oil;
- Transport and construction vehicles shall abide by the Standard TCVN 6438-2001 with respect to maximum exhaust fumes allowed;
- Material loads shall be suitably covered and secured during transportation to prevent the scattering of soil, sand, materials or dust;

Noise and vibration control

Machinery and equipment must be maintained and operated, so as to minimize operational noise, particularly on land near residential or commercial areas.

Disposal Site Management:

- Embankments shall be built in compliance with detail design. The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works. Existing drainage channels in areas affected by the operation should be kept free of overburden; The Contractor shall ensure that disposal sites are left in a trim and tidy condition with stable side slopes, restoration of natural water courses in the surrounding areas, avoidance of flooding of the excavated areas wherever possible so no stagnant water bodies are created which could breed mosquitoes;
- More detail on Disposal Site management requirements are specified in the Dredged Materials Disposal Plan, which also be part of the Bidding document.

Waste Management:

- Contractors must coordinate site activities and waste disposal with local urban waste management.
- Collection and disposal of domestic waste shall be coordinated with local authorities.
- Portable toilets should be placed in appropriate locations within a site.
- All construction waste on site will be collected into bins in the site. The Contractor shall provide refuse bins, all with lids, for all buildings and construction sites; Refuse shall be collected and removed from all facilities at least twice per week; Domestic waste shall be transported to the approved refuse disposal site in covered containers or trucks;
- Materials from construction – except metal – will be disposed in locations designated by the local government.
- Metal waste must be stockpiled on site within a designated location for subsequent collection. The Construction Site should be maintained tidy and clean.
- Used oil/fuel from heavy equipment must be contained in appropriate bins. Used oil will be transported off-site and processed after the project.
- Materials from dredging must be disposed properly in designated locations. Barges containing sediment must be operated so as to avoid accidental loss of dredged materials during transit to the disposal site.
- Vehicles transporting materials and aggregate must be covered properly to prevent material loss or accidental spillage.
- The truck must be controlled to do not carrying overloaded.

Protection of Fauna:

- The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place, especially at clustered bird and alluvial river areas;
- The feeding of any wild animals shall be prohibited;
- The use of pesticides shall be approved by the EMT;
- No domestic pets or livestock shall be permitted on site.

A3: MATERIALS HANDLING, USE AND STORAGE MANAGEMENT

Materials Transportation:

- The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g.. restricted areas);
- Material shall be appropriately secured to ensure safe passage between destinations during transportation;
- Loads shall have appropriate cover to prevent them spilling from the vehicle during transit;
- The Contractor shall be responsible for any clean-up resulting from the failure by his employees to properly secure transported materials.
- All hazardous material / substances (e.g.. petrochemicals, oils, etc..) shall be located in proper areas and approved by the EMT
- All hazardous material / substances shall be stored in a secured, appointed area that is fenced and has restricted entry. All storage shall take place using suitable containers;
- Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure;
- Fuel shall be stored in a steel tank supplied and maintained by the fuel suppliers. The tank shall be located in a secure, demarcated area.

Maintenance of Construction Equipment:

The Contractor shall:

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

A4: SAFETY MANAGEMENT PLAN

- Safety and Environmental rules must be displayed on site
- Site diary from contractor must be permanently available on works site.

Construction Site Safety:

- The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. During construction, Contractors must strictly follow safety standards according to TCVN 5308 – 91. Specifically:
- Waterway safety (Regulations on signals and signs for inland Waterways: 22TCVN 269-2000).
- Road safety.
- Safety in operation of a disposal site;
- Implement safety protection measures required for Waterways activities.
- No activity should affect operation and safety of Waterways during a construction period.
- Ensure that all works, equipment and installed machinery do not result in dangerous conditions for the Waterways and roadways.
- All tasks and activities are planned and coordinated according to requirements from the Project Manager.
- The Contractor should always implement instructions from Waterways and road authorities.
- Follow safety regulations on fire/explosion prevention.
- Before starting works, Contractors must conduct worker safety training and disseminate safety regulations to all staff and workers in the construction site.
- Contractors must assign one staff person specialized in work safety with sufficient experience in construction site safety. Safety staff should recommend on issues affecting workers' safety and propose measures to increase safety in construction.
- All equipment, vehicles operating in the construction should be registered and have operational permits. The Contractor should ensure all vehicles are functional and maintained regularly.

Worker safety:

All work site conditions will be in full compliance with the Law of Labor, Ordinance of Labor Protection, and social insurance regulations. The Contractor will obtain and maintain accident insurance for all site workers and staff.

Contractors must possess the following types of insurance:

- Insurance for all risks in construction
- Insurance for laborers
- Insurance for responsibility of the third party
- Insurance for vehicles, equipment
- Other insurance as required by the contract

All workers and site staff should be trained in appropriate safety regulations. All working conditions should fully implement the slogan "Safe to work, work to safe".

Contractors are responsible for developing safety rules and procedures for site staff and laborers during construction activities, both on land and in the Waterways. The Contractor's Manual of Health & Safety Procedures will be submitted to the Project Consultants and Client for review and approval before construction is initiated at any Site.

The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

All staff is trained in and fully understands approved safety procedures.

All workers follow these safety procedures when constructing civil works.

Experienced specialized safety staff is assigned and equipped with warning signs, warning tape and other equipment to identify dangerous work areas.

Provide personal protective equipment (PPE) to protect worker health and safety such as hardhat, goggles, gloves, insulated shoes, steel-toed boots, eyes protection glasses (for welders), toxic/dust face mask (for cement porters), respirators for construction workers and enforce their use;

During heavy rains, accidents, or emergencies of any kind, suspend all work; Brace electrical and mechanical equipment to withstand seismic events during the construction.

Establish safe sight distance in both construction areas and construction camp sites;

Limit the speed of vehicles moving within the construction site;

Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. All signs shall be constructed according to Vietnamese specifications;

Contractors must arrange signs and remind workers to maintain safe working practices in all locations.

For a construction site, there must be a properly equipped first-aid station and medical staff with appropriate professional certifications to provide adequate response and treatment for workers involved in accidents or sickness.

There must be adequate equipment to respond to safety or fire protection requirements and this equipment must always be ready to respond. Mobile fire extinguishers must be placed, strictly following regulations on fire protection for vehicles, equipment with fire risks. Activities at a site must be organized according to TCVN "Fire safety – General requirements".

All construction vehicles on the water must be equipped with life buoys/rings that are regularly checked to meet regulation.

For night time work, there must be sufficient light to ensure proper and safe working conditions.

Site Facilities and Equipment Safety:

- Contractors must build a temporary fence to protect the site with security guards present 24/7 to ensure site security, protect equipment and keep unauthorized people out of the site.
- The Contractor should prepare protocols and procedures to protect the general and area environment, machinery and other equipment during the course of construction.
- The Contractor should carefully check the anchor system of floating equipment and vessels and signal systems such as floating beacons, signs, and signal lights both on the river and on shore.
- Waterways vessels must not anchor or tie-up to site works during the course of construction.

- To ensure safety for workers, all machinery and equipment should be operated in a safe manner, following safety regulations according to instructions from manufacturers.
- The Contractor should develop regular maintenance and repair schedules for equipment and implement as required.
- The Contractor should regularly check technical and operational specifications of all machinery, both directly and indirectly taking part in activities of the site.
- Any lifting equipment and cranes should be located on the ground with solid structure or on a floating system with sufficient pressure bearing capability, be stable and be anchored by firm anchoring system.
- Transferring, handling and storage of equipment and supplies should be conducted carefully during construction, ensuring items are able to bear weights and are not affected by components under construction or still to be built.
- Before removing formworks and supports for concrete components, the concrete quality must be tested by appropriate internationally-accepted sampling and testing protocols, accepted by the Project Consultants.
- Accidental hitting of materials or civil works during crane operations should be avoided.
- All equipment operators must be trained properly and possess appropriate certification.
- Any rebar or other internal structural components should be selected so as to not affect the appearance of the works, the pressure-bearing capacity and anti-corrosion capacity of the works.
- When floods or storms occur, all works must be supported and protected properly. Bank protection or temporary road sections must be secured and covered properly.
- Electricity cables serving construction and residential quarters must be located in appropriate locations, unaffected by working equipment. At working locations, ground wire and automatic circuit breakers must be installed. Electric cables must be sized to provide sufficient handling capacity.
- Joints of electric cables must be appropriately joined and sealed with insulated waterproof materials.
- Electric equipment must have signs, ground wire and appropriately shielded. The Contractor should strictly follow TCVN 4086 "Electricity Safety in Construction – General requirements"
- The Contractor should ensure social and public security within the site as well as nearby areas. Measures must be taken to manage staff and workers including registering temporary staff with local police.
- The Contractor must implement waterproof/outdoor plugs and lights.
- The Contractor should regularly coordinate and cooperate with authorities and agencies to ensure public security on the site.

Traffic Management:

Because the Project involves a significant scope of activity at any one Site, whether within the Waterways or on land, there will be numerous pieces of equipment, machinery, associated supplies and workers in the general area of each Site. As soon as possible after receiving approval to proceed and obtaining management of a site, the Site Contractor must identify the boundaries of the

construction site and install appropriate signage, especially at material storage areas or dredged material disposal sites. On the river side, appropriate signs and navigation aids should be placed to define the navigation channel area and ensure navigation safety. It is critical to keep vehicles or shipping from entering the construction area, interfering with construction activities or endangering workers.

With respect to work in the Rivers, the Contractor shall:

- Coordinate with the Viet Nam Inland Waterways Administration, provincial Ministries of Transport and relevant River management stations to ensure navigation safety in relevant areas of the river.
- Ensure traffic safety as the first priority for the Contractor along the navigation channel within and outside the construction locations. It is important to ensure that shipping is not inadvertently diverted to non-navigable areas or involved in accidents.
- Install construction site signs as appropriate within and along the river, including appropriate navigation aids. Signage should be posted in any area of operating equipment or construction activities. Speed limit signs should be posted for all river craft passing the site.
- Dredging locations should be fully identified. River traffic should be controlled using buoys and lights to ensure vessels can operate safely. It may be necessary to set up a temporary fence or berm to limit spreading of disposed sands/mud and signs should be posted to limit entry of people.
- The Contractor should regularly ensure anchored vessels and other equipment do not impede passing vessels.
- All anchored vehicles must be located, with appropriate safety equipment according to current regulations and instructions.
- All barges to transport dredged materials, tug boats and other vessels related to dredging will be equipped with signal light while anchoring and moving on the river, pursuant to Government Circular No. 40/CP on Waterways traffic safety.
- Coordinate with Waterways police and River management stations to regulate traffic properly during the construction process. All vessels should strictly follow river traffic laws and regulations.

With respect to roads, the Contractor shall:

- Estimate maximum concentration of traffic (number of vehicles/hour);
- Construction vehicles shall comply with speed limits;
- Present details regarding maximum permissible vehicular speed on each section of the Road to EMT;
- Use selected routes to the project site, as agreed with the EMT, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes;
- Maintain adequate traffic control measures throughout the duration of the construction activities and such measures shall be subject to prior approval of the EMT;

- Carefully and clearly mark pedestrian-safe access routes;
- Promote and disseminate traffic safety information to local residents;
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- Ensure traffic safety at intersections, especially near sensitive areas (schools, markets, hospitals, and historical, cultural and religious places).
- Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
- Use signs and flagon for traffic control;
- Be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and be required to repair such damage to the approval of the EMT;
- Materials leaving or entering the construction site shall be transported during non-peak hours in order to minimize traffic noise due to the increase in traffic volume;
- Not use any vehicles, either on or off road with grossly excessive noise or exhaust emissions, producing bad odor, or overloaded. In any built up areas, noise mufflers shall be installed and maintained in good condition on all motorized equipment under the control of the Contractor. Exhaust fumes shall comply with Standard TCVN 6438-2001.

Maintenance of roads, yards, works, architectural objects and available service systems:

- Any roads, yards and works, buildings and available utility services affected by the construction activities will be maintained and/or repaired during the course of construction.
- Contractors should select suitable transportation routes for the types of vehicles and weight of vehicle loads being used.

Restoration of Land Occupied by Construction Camp / Staging Area:

The use of the construction camp/staging area is only temporary, hence, at the end of construction period, the land will be returned to the landholder who can then resume the former productive use of the land. As such, the contractor should remove all equipment, structures, rubbish and obstructions and restore the land to its condition prior to use for construction. The contractor will also be responsible to repair the damages, if any, caused to local roads used for transportation of dredging materials by heavy construction plants used. The contractor will be responsible for reinstatement of local roads before dredging work is completed.

A5: PHYSICAL CULTURAL PROPERTY CHANCE_FIND PROCEDURES

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

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;

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

Other Site Protection Issues

To protect the site and ensure nearby areas are not damaged and polluted during the course of construction, Contractors must carry out the following measures:

Identifying architectural components, utility services (particularly buried and overhead) and current structures that would be affected by the proposed civil works. All sites should be carefully inspected and photographs taken starting civil works. The results of survey will be documented and copies provided to Consultant and Client.

Spare buoys must be installed in the river to designate locations of the underwater works such as electrical cables, water supply pipes, etc.

Contractors must have remedial measures available at all times to address damage to works, buildings and structures and utility services.

A6: COMMUNITY ELATIONS AND HEALTH MANAGEMENT PLAN

Community Relations

The Contractor shall:

- Maintain open communications between the local government and concerned communities;
- Have a mailing list to include agencies, organization, and residents that are interest in the project;
- Disseminate project information to affected parties (for example local authority, enterprises and affected households, etc.) through community meetings before construction commencement;
- Provide a community relations contact from whom interested parties can receive information on site activities, project status and project implementation results;
- Provide all information, especially technical findings, in a language that is understandable to the general public and in a form of useful to interested citizens and elected officials through the preparation of fact sheets and news release, when major findings become available during project phase;
- Monitor community concerns and information requirements as the project progresses;
- Respond to telephone inquiries and written correspondence in a timely and accurate manner;
- Inform local residents about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, blasting and demolition, as appropriate;
- Provide technical documents and drawings to PC's community, especially a sketch of the construction area and the EMT of the construction site;
- Notification boards shall be erected at all construction sites providing information about the project, as well as contact information about the site managers, environmental staff, health and safety staff, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions;
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures;
- At least five days in advance of any service interruption (including water, electricity, telephone, and bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses. A coordination system between the Contractor and local authorities shall be set up to solve problems and incidents incurred.

Health Management Plan

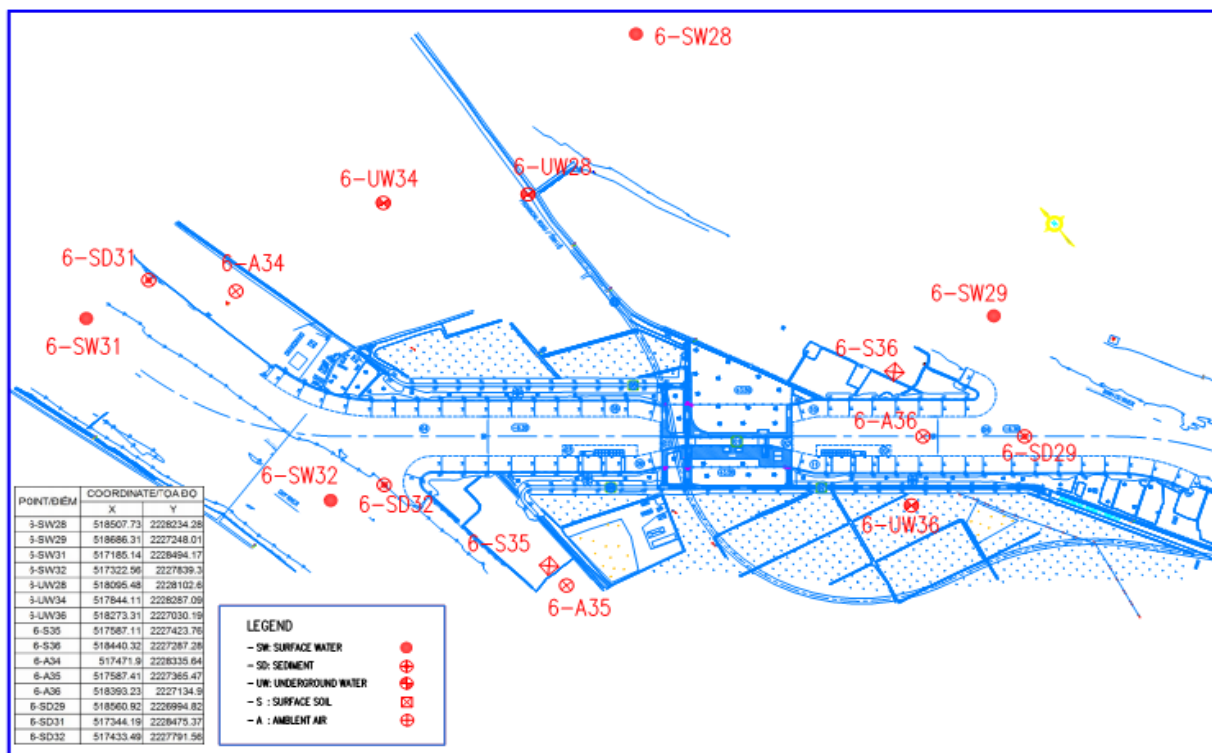
The Contractor shall:

- Prepare and enforce a Health Management Plan to address matters regarding the health and well-being of construction workers, project staff and nearby communities.
- Purpose outline of the Health Plan. The EMT will issue a certificate of compliance to the Contractor prior to the initiation of Construction.
- Require screening of all workers on recruitment and annually;
- Implement a vaccination program including but not limited to vaccination against yellow fever, hepatitis A and B, tetanus, polio, etc.
- Provide periodical health check to construction workers to ensure their health and well-being.

- Provide appropriate information and education to the workforce on basic personal hygiene, prevention of diseases, including respiratory diseases, vector-borne diseases such as malaria and dengue, water and food borne diseases such as diarrheal, tuberculosis, etc.;
- Implement a program for workers and local communities, via an approved service provider, for the prevention, detection, screening, and diagnosis of sexually transmitted diseases, especially with regard to HIV/AIDS;
- Distribute educational materials to all workers including brochures, and leaflets which provide information of Tuberculosis (TB), HIV/AIDS symptoms and counselling and treatment services.
- Implement preventive measures against malaria, if applicable.
- Provide basic first aid services to the workers as well as emergency facilities for emergencies for work related accidents including a medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital;
- Include a Pest Management Program for the construction areas, including construction work camp areas, in the Health Management Plan. The use of pesticides shall follow procedures acceptable to the World Bank and the government of View Nam;
- Ensure correct maintenance of water and water treatment plants to prevent the breeding of mosquitoes.

ANNEX B: MONITORING NETWORK DURING PRE-CONSTRUCTION, CONSTRUCTION AND OPERATION PHASE

Table B.1: Location of Samples



Air quality and Noise Emissions				
No	Area	Location	Code	Coordinate
1	Field/land near Day river	Upstream Day river works area	6-A34	X = 517471.9
				Y = 2228335.64
2	Day river	Downstream Day river works area	6-A35	X = 517587.41
				Y = 2227365.47
1	Field/land near Day river	Upstream Ninh Co river works area	6-A28	X = 520765.3157
				Y = 2214220.2683
2	Day river	Upstream Ninh Co river works area	6-A36	X = 518393.23
				Y = 2227134.9

Surface water quality				
No	Area	Location	Code	Coordinate
1	In 2 Day and Ninh Co rivers near DNC area	Upstream Day river works area	6-SW31	X = 517185.14
				Y = 2228494.17
2		Downstream Day river works area	6-SW32	X = 517322.56
				Y = 2227839.3
3		Upstream Ninh Co river works area	6-SW28	X = 518507.73
				Y = 2228234.28
4		Downstream Ninh Co river works area	6-SW29	X = 518686.31
				Y = 2227248.01

Sediment quality				
No	Area	Location	Code	Coordinate
1	Disposal sites	Disposal site in Northern	6-SD31	X = 517344.19
				Y = 2228475.37
2		Disposal site in Southern	6-SD29	X = 518560.92
				Y = 2226994.82

Underground water quality					
No	Area	Location	Code	Coordinate	
1	Field/land near DNC canal works area	Near works area	6-UW28	X =	518095.48
				Y =	2228102.6
2		Near works area	6-UW34	X =	518273.31
				Y =	2227030.19
3		Near works area	6-UW36	X =	518273.31
				Y =	2227030.19

Surface soil quality				
No	Area	Location	Code	Coordinate
1	Field/land near DNC canal works area	Toward Day river	6-S35	X = 517587.11
				Y = 2227423.76
2		Toward Ninh Co river	6-S36	X = 518440.32
				Y = 2227287.28

Table B.2. Components and their characteristics

No.	Component	Construction	Operation
<i>I</i>	<i>Noise</i>		
	1. Parameter	L _{eq} , L _{max} , L ₅₀	L _{eq} , L _{max} , L ₅₀
	2. Frequency	2 times / month	1time/6 months in a year after
	3. Location	04 sites	04 sites
	4. Standard	QCVN 26:2010/BTNMT	
<i>II</i>	<i>Vibration</i>		
	1. Frequency	2 times / month	1time/6 months in a year after
	2. Location	04 sites	04 sites
	3. Standard	QCVN 26:2010/BTNMT	
<i>III</i>	<i>Air quality</i>		
	1. Parameter	TSP, PM ₁₀ , CO, SO ₂ , NO ₂ , and microclimate.	TSP, PM ₁₀ , CO, SO ₂ , NO ₂ , and microclimate.
	2. Frequency	2 times / month	1time/6 months in a year after finishing.
	3. Location	04 sites	04 sites
	4. Standard	QCVN 05 :2013/BTNMT & QCVN 06:2009/BTNMT	
<i>IV</i>	<i>Water quality</i>		
	1. Parameter	Temperature, pH, conductivity, Turbidity, DO, COD, BOD ₅ , TSS, Cu, Zn, Pb, As, Cd, Hg, Fe, Al, NO ₂ ⁻ , NO ₃ ⁻ , Cr ⁶⁺ , PO ₄ ³⁻ , Salinity, Oil and Grease.	Temperature, pH, conductivity, Turbidity, DO, COD, BOD ₅ , TSS, Cu, Zn, Pb, As, Cd, Hg, Fe, Al, NO ₂ ⁻ , NO ₃ ⁻ , Cr ⁶⁺ , PO ₄ ³⁻ , Salinity, Oil and Grease.
	2. Frequency	2 times/ month, 2 samples/sites (surface and 2m down from surface)	1 time/6 months in a year after finishing, 2 samples/sites (surface and 2m down from surface)
	3. Location	11 sites	11 sites
	4. Standard	QCVN 08 : 2008/BTNMT (B2 column); QCVN 09:2008/BTNMT; QCVN 02:2009/BTNMT	
<i>V</i>	<i>Soil monitoring</i>		
	1. Parameter	Cu, Pb, Zn, As, Cd, Cr, Ni, Hg, Fe, salinity, pH	Cu, Pb, Zn, As, Cd, Cr, Ni, Hg, Fe, salinity, pH
	2. Frequency	1 time/ 3 months, 2 samples/sites (surface and deep)	1 time/6 months in a year after finishing, 2 samples/sites (surface and deep)
	3. Location	04 sites	04 sites
	4. Standard	QCVN 03 : 2008/BTNMT; QCVN 15:2008/BTNMT; QCVN 43:2012/BTNMT	

C-1: Supervisory Roles

PMU-W:

The PMU-W shall create an environmental unit to manage the environmental and social effects of the Corridor 3 project throughout its life.

The PMU-W Environmental Officer (PEO) will represent the PMU-W for all matters related to the project and will be responsible for overall coordination of EMP implementation.

The Construction Supervision Team (CST) is responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CST shall engage qualified staff (e.g. Environmental Engineers) with adequate knowledge on environmental protection and construction project management to be Supervising Environmental Officers (SEO) to perform the required duties and to supervise the Contractor's performance.

Contractor:

The Contractor shall allocate an Environmental Team which comprises of adequate number of Workplace Safety and Environmental Officer(s) (CEOs) of suitably qualified and experienced staff within their organization or sub-contract to an institution experienced in EMP who would provide an SEO.

The Contractor's Workplace SEO responsible for implementing the EMP and other construction related environmental and safety issues.

C-2: Qualifications

The CEOs shall have adequate experience in environmental management, supervision and monitoring on construction projects, and be familiar with Vietnam environmental legislatives requirements. The qualification of the proposed CEO shall be approved by the PEO prior to commencement of the project. At least one CEO is required to work full time on-site.

C-3: Responsibilities

The responsibilities of the CEOs include the following:

- Supervise the Contractor's compliance with contract specifications, including the implementation and operation of environmental mitigation measures and ensure their effectiveness, and other aspects of the EMP Implementation Plan. Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the Project Supervision Engineer. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety;
- In case the CST considers that the CEO fails to discharge duties or fails to comply with the contractual requirements, instruct the Contractor(s) to replace the CEO;

- Instruct the Contractor(s) to take remedial actions within a specified timeframe, and carry out additional monitoring, if required, according to the contractual requirements and procedures in the event of non-compliances or complaints;
- Supervise the Contractor's activities and ensure that the requirements in the EMP and contract specifications are fully complied with;
- Instruct the Contractor(s) to take actions to reduce impacts and follow the required EMP procedures in case of non-compliance / discrepancies identified;
- Instruct the Contractor(s) to stop activities which generate adverse impacts, and/or when the Contractor(s) fails to implement the EMP requirements / remedial actions instructed by the SES;
- Participate in the joint site inspection undertaken by the CEO; and
- Adhere to the procedures for carrying out complaint investigation.
- The CEO is responsible for implementation and management of the EMP program. The roles and responsibilities of CEO are:
 - Sampling, analysis and evaluation of monitoring parameters with reference to the EMP recommendations and requirements;
 - Carry out environmental site surveillance to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation implemented;
 - Review the success of the EMP Implementation Plan to cost-effectively confirm the adequacy of mitigation measures implemented;
 - Monitor compliance with environmental protection, pollution prevention and control measures, and contractual requirements;
 - Monitor the implementation of environmental mitigation measures
 - Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
 - Complaint investigation, evaluation and identification of corrective measures;
 - Advice to the Contractor on environment improvement, awareness, proactive pollution prevention measures;
 - Follow the procedures in the EMP and recommend suitable mitigation measures to the Contractor in the case of non-compliance / discrepancies identified. Carry out additional monitoring works within the specified timeframe instructed by the PEO; and
 - Liaison with the Contractor and PEO on all environmental performance matters, and timely submission of EMP Implementation Plan reports to the PEO, CST, and relevant administrative authorities, if required;

Environmental Management Plan:

An Environmental Management Plan was prepared in accordance to the MONRE's Circular Number 5 and requirements of the World Bank. The program will be used as guide to put in order the administration of the commitment of the proponent in the protection of the environment while the project is being implemented which will also be carried out during the operation phase of the NDTDP Phase 2 for Corridor 3 section.

The discussion of the Environmental Management Plan or so called as Environmental Management Plan in the Terms of Reference (TOR), Bid Documents and by the World Bank, is divided into two (2) parts.

One is the Summary of the Environmental Management Plan

The second one is the Environmental Monitoring Program.

The former is in tabulated form with seven (7) columns that include Project Activities during the Preparation/Pre-Construction, Construction and Operation, the Impacts, Mitigation Measures, Proposed Budget, Schedule/Time Estimate, and the Agencies involved in the EMP Implementation and EMP Monitoring/Supervision.

Details on the Institutional Responsibilities and proposed Capacity Building/Training on Environmental Management are also at hand which could enhance the efficiency in carrying out implementation of the EMP.

Subsequent part of the EMP is the Environmental Monitoring Plan which is composed of three (3) sections, namely: Pollutions Sources from the Project and Its Volume/Concentration, Ambient Environment Quality Monitoring and other monitoring of pollution or impacts due to project-related activities. The parameters and monitoring locations are identified and tabulated. Monitoring locations are shown in the attached maps with clear legend and specific coordinates as per applicable regulations.

Summary of the Environmental Management Plan

The summary of the Environmental Management Plan is shown in Table C.1.

Table C.1. Summary of the Environmental Management Plan

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
Preparation Phase- Detailed Engineering Design; Displacement, land acquisition	Predicted impacts in the EIA	-Prepare an EMP as part of the Tender Document.	Included in the Project Contract for Detailed Design	10-12 months	Design Consultant	PMU-W; World Bank; MONRE
	Land acquisition and resettlement	-Prepare and implement the Resettlement Action Plan -Conduct Information, Education, Communication -Conduct Public Consultation -Prepare land for disposal sites.	Budget in RAP		PMU-W; Provincial land acquisition and compensation unit Nam Dinh Province	DONRE of Nam Dinh
Construction Phase - Dredging, excavation, civil works	Impacts on Air Quality	-Construction equipment emission shall be within the values of QCVN 05:2009/BTNMT & QCVN 06:2009/BTNMT. -Access roads will be located in unpopulated or sparsely populated area. -Construction materials (e.g sand, clay, cement, stones) even during hauling should be covered -Concrete mixing plant emission will have to comply the Vietnam Standard for Air Emission (QCVN 05:2009/BTNMT & QCVN 06:2009/BTNMT). -Stockpile area will be located away from residential areas.	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	DONRE of Nam Dinh

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
		-Regular sprinkling of water of exposed areas will be undertaken.				
	Mitigation of Potential Impacts on Water Quality	From Channel Dredging -Use cutter suction dredges, excavators and other earth-moving equipment where required. -Do not over-dredge a channel section. -A berm of material should be retained during excavation in the dry. -Deploy a silt curtain around the dredge.	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	DONRE of Nam Dinh
		From Construction Camps -Provide sealed septic tanks. -Provide impervious flooring, containment wall and floor sump to collect oily wash water and to allow separation of solids.	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	DONRE of Nam Dinh

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
	Construction Waste	<ul style="list-style-type: none"> -Practice waste segregation, recycling and waste minimization. -Hazardous wastes should be disposed of in authorized disposal facilities. -Portable toilets should be placed in appropriate locations within a site. -All construction waste in the site will be collected in bins and will be transported to the designated garbage sites on a regular basis. -Metal waste could be collected by a contract buyer. -Used oil from heavy equipment must be contained in appropriate bins. Used oil will be transported off-site and processed after the project. -Soils from dredging must be loaded/ transported /disposed properly. 	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	DONRE of Nam Dinh
	Restoration of Land Occupied by Construction Camp / Staging Area	-Remove all equipment, structures, rubbish and obstructions and restore the land to its original condition.	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	
	Mitigation of	-Investigate and remove all explosive	Included in the	Construct	Contractor	DONRE of Nam

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
	Hazards Due to the War Residues	material (bombs, mines) before commencement of construction activity through the assistance of the Engineering Corp of the Ministry of Defense	Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	ion Period		Dinh
	Impacts of Spoil Disposal	<ul style="list-style-type: none"> -Supernatant water will be discharged from the transport barges at the dredging site before moving to the designated area. -Use cutter suction dredge with materials transported by pipeline to designated disposal sites where required. -Construct temporary berms on two or more sides to an appropriate height to prevent the loss of supernatant water and/or disposed sediments. -Deployed silt curtain. -Follow the Dredged Materials Disposal Plan . 	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construct ion Period	Contractor	DONRE of Nam Dinh
	Spillage of chemicals	-The dredging and excavation contractors will be required to maintain suitable equipment, booms and other clean-up supplies to respond to spills or leaks associated with loss of petroleum hydrocarbons from their equipment.	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25, 2007	Construct ion Period	Contractor	DONRE of Nam Dinh

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
		The Project Environmental Protection and Implementation Plan will provide detailed instruction on reporting, clean-up of spills and general response procedures.				
	Traffic congestion	<p>Traffic Management</p> <ul style="list-style-type: none"> -Use the available road routes and navigation channels if necessary. -Boundary of the construction site must be identified with signs installed. -On the river side, appropriate signs and navigation aids should be placed to define the navigation channel area and ensure navigation safety. -Contractor will coordinate with the Client and supervision Engineers, as well as traffic police to ensure traffic safety is maintained on relevant areas of local roads. -With respect to work in the Rivers, the contractor will coordinate with the Port management agency, the River management sub- stations and the River management stations on the construction area to ensure navigation safety in relevant areas of the river. -At any construction site entry and exit location, there must be a traffic control flagman to control passing vehicles. 	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	DONRE of Nam Dinh

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
		<ul style="list-style-type: none"> -Construction vehicles should avoid operating in peak hours of traffic. -All vehicles and vessels should strictly follow road and river traffic law. -Construction vehicles should be properly maintained. <p>Traffic monitoring in and out of the site: Any impact on public traffic from construction activities must be checked and corrected to minimize the impact on traffic caused by construction vehicles.</p>				
	Accident due to construction (Public hazard)	<ul style="list-style-type: none"> -Construction site shall be off-limits to non-workers -Warning signs shall be prominently posted along the site periphery -Disposal sites of contaminated spoils shall also be off-limits to people. -Health screening will be done for workers to prevent spread of disease to the host community; -Use of illegal drugs shall be strictly prohibited in the construction site to prevent spread of HIV disease and other possible social problems. -For navigational safety, the dredging work 	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Phase	Contractor	DONRE of Nam Dinh

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
		should be announced in the Notice to Mariners.				
	Construction-related accidents (workers)	<ul style="list-style-type: none"> -Workers shall be provided with personal protection equipment. -A first aid station be provided in the construction site -A safety officer shall be designated on site -Workers shall be provided with ample clean water -Sanitary facilities shall be available in the construction site; -An emergency warning system shall be instituted to protect workers from site emergencies and natural hazards. -Evacuation plan for extreme emergency conditions shall be formulated. 	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	DONRE of Nam Dinh
						DONRE of Nam

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
		<p>Safety and Fire Prevention Plan</p> <p>Contractors must strictly follow safety standards according to TCVN 5308 – 91. Specifically:</p> <ul style="list-style-type: none"> -Waterway safety (Regulations on signals and signs for inland Waterways 22TCVN 269-2000). -Road safety. -Safety in operation of a disposal site; -Safety protection measures required for Waterways activities. -Ensure that all works, equipment and installed machinery does not result in dangerous conditions for the Waterways and roadways. -All tasks and activities are planned and coordinated according to requirements from the Project Manager. -Implement instructions from Waterways and road authorities. -Dredging locations should be fully identified and traffic controlled using buoys and lights to ensure vessels can operate. -Any lifting equipment and cranes should be located on the ground with solid structure or on a floating system with sufficient pressure 	Included in the Contingency Cost (Circular 05/2007/TT-BXD of July 25,2007	Construction Period	Contractor	Dinh

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
		bearing capability. Contractors must possess the following types of insurance: Insurance for all risks in construction Insurance for laborers Insurance for responsibility of the third party Insurance for vehicles, equipment -When floods or storms occur, all works must be supported and protected properly. Bank protection or temporary road sections must be secured and covered properly.				
	With Environmental Problems a) Storms and tropical Low Pressures; b) Sedimentation, Erosion and Land Slide; c) Drought and Hot Temperature, and; d) Earthquake.	Optimum options will be considered in compliance with the Vietnamese/International Design Codes and Standards.	MOT Funds	Operation Phase	Authorized Agency of MOT	Ministry of Transport; Vietnam Inland Waterways Administration
Operation Phase- Operation /Use and	Impacts on air and water quality and tourist destinations; channel bed	a) Mitigation measure to minimize air pollution -The MOT, Authorized Agency of MOT in coordination with the MONRE should strictly	MOT Funds	Operation Phase	Authorized Agency of MOT	Ministry of Transport; Vietnam Inland Waterways

Project Phase/Activities	Impacts	Mitigation Measures	Proposed Budget (Million VND)	Schedule	Agencies responsible for EMP Implementation	Agencies responsible for EMP Supervision
maintenance of the improved channel	sedimentation by alluvial transportation and sand transportation activities on the channel; sunken vessel accidents, shocks and oil spill	<p>impose the Vietnamese Standards on Ambient Air Quality</p> <p>b) Mitigation measure to lessen Erosion and Deposition</p> <p>-Installation of navigation aids and advisory/signs.</p> <p>c) Mitigation measure to minimize water pollution</p> <p>MOT, PMU-W in coordination with the MONRE should strictly impose the regulations relative to waste disposal in the water bodies. Operators and owners of water transport should be provided with seminars/training for them to be aware of the negative impacts of such practice.</p> <p>d) Mitigation Impacts on Protected Areas</p> <p>The Waterways transport operators should be provided with environmental awareness training by the PMU-W in coordination with the MONRE.</p>				Administration
<p>Note:</p> <p>Dredged Materials Disposal Plan</p> <p>The objective of the Dredged Material Disposal Plan is to describe best practices and mitigation measures to significantly reduce identified environmental impacts.</p> <p>A separate report was prepared and attached in this EIA Report.</p>						

Resettlement Action Plan (RAP)

A separate report on the Resettlement Action Plan was prepared that layout the procedure on land acquisition, compensation and resettlement due to the implementation of the NDTDP Phase I. The principle for resettlement policy in the project will be as follows:

Acquisition of land and other assets, and resettlement of people will be minimized as much as possible.

All DP residing, working, doing business or cultivating land within the recovered area under the Project as of the cut-off-date are entitled to be provided with rehabilitation measures sufficient to assist them to improve or at least maintain their pre-Project living standards, income earning capacity and production levels. Lack of legal rights to the assets lost will not bar the DP from entitlement to such rehabilitation measures.

The rehabilitation measures to be provided are: (i) compensation at replacement cost without deduction for depreciation or salvage materials for houses and other structures; (ii) priority given for compensation mode of agricultural land-for-land of equal productive capacity acceptable to the DP; (iii) priority given for compensation mode of replacement of residential land (if any) of equal size and with access to public facilities and services acceptable to the DP; (iv) transportation and subsistence allowances, and (v) business/income rehabilitation allowances.

Replacement residential and agricultural land will be as close as possible to the land that was lost, and acceptable to the DP. In case replacement land at location acceptable to the DP is not available, or at the informed request of the DP, cash compensation may be applied. If a DP loses more than 20% of his or her agricultural land holding, then in addition to the compensation for lost land, the project will provide rehabilitation /assistance measures.

The resettlement transition period will be minimized and the rehabilitation means will be provided to the DP no later than one month prior to the expected start-up date of civil works in the respective Project site.

Plans for acquisition of land and other assets and provision of rehabilitation measures will be carried out in consultation with the DP to ensure minimum disturbance. Entitlements will be provided to DP no later than one month prior to the expected start-up of civil works at the respective project site.

The previous level of community services and resources will be maintained or improved.

Adequate budgetary support will be fully committed and made available to cover the costs of land acquisition and resettlement and rehabilitation within the agreed implementation period. Physical resources for resettlement and rehabilitation will be made available as and when required.

The contractors should only start their civil works in those project's sections where the compensation payment and rehabilitation assistances is completed in accordance with the project's resettlement policy.

Institutional arrangements will ensure effective and timely design, planning, consultation and implementation of the Resettlement Plan (RP).

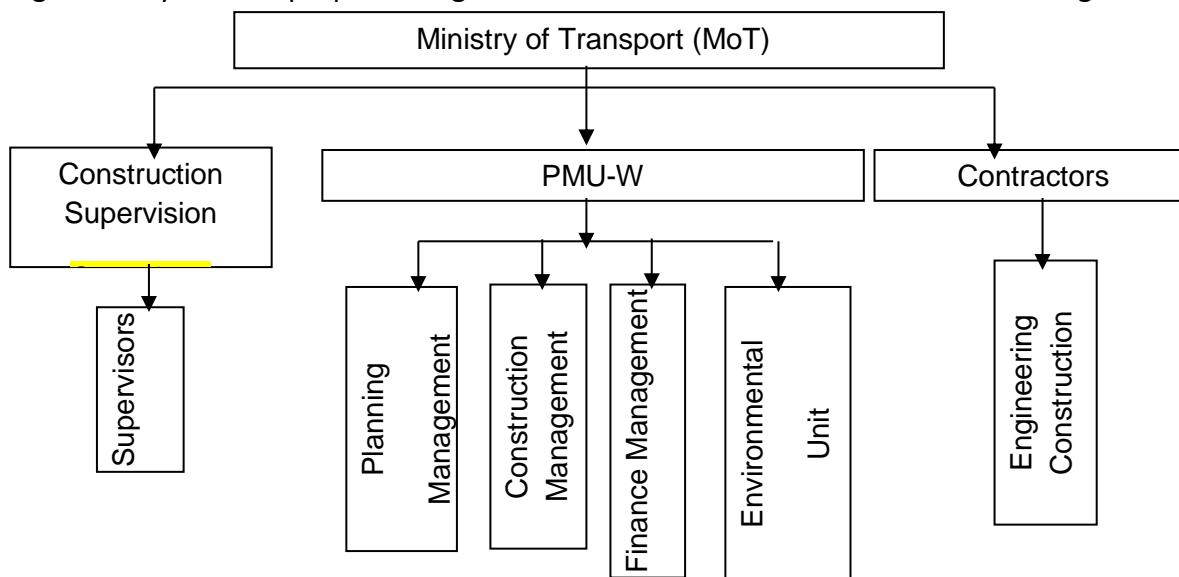
Appropriate reporting, monitoring and evaluation mechanisms will be identified and set in place as part of the resettlement management system. Evaluation of the land acquisition process and the final outcome will be conducted independent of the executing agency.

Institutional Responsibilities

To implement and manage effectively the proposed environmental protection works in the project area, all parties involved in the project implementation will perform respective roles and responsibilities. The proponent sees to it that the obligations on environmental protection of contractors/sub-contractors both for supervision and construction are tied up in their contracts before approval.

Organizational Structure

Figure 5. Layouts the proposed Organizational Structure of the Construction Management.



Roles and Responsibilities

Project Management Unit of Waterways

The Project Management Unit of Waterways is the representative of MOT who is responsible for implementing the Law on Environmental Protection No. 52/2005/QH11. Project Management Unit is the organizer, appoints department in charge of the environment. On behalf of project management unit, the Project Manager who is most responsible for the undertaking will report to the State management agency on the status of environmental compliance of the project periodically (every 3 months) and in extraordinary cases.

Binding to the Law on Environmental Protection for Vietnamese Projects are as follows:

- i) Preparation and inclusion of the Environmental Management Plan (EMP) in the Tender Documents.
- ii) The survey and environmental monitoring to be conducted during construction will be in accordance with the outline of the Environmental Impact Assessment Report.
- iii) Environmental Monitoring Reports will be prepared on quarterly basis and will be submitted to the Department of Natural Resources and Environment of the Provinces of Phu Tho, Nam Dinh and Ninh Binh.

- iv) Additional recommendations/mitigation measures (e.g. Independent Monitoring Consultant, Stakeholders) will be incorporated in the EMP to further lessen the impacts not predicted during the conduct of environmental assessment.
- v) Coordinate regularly with the Department of Natural Resources and Environment of Phu Tho, Nam Dinh and Ninh Binh provinces to know and address project-related concerns.

To facilitate the implementation of the EMP, the Project Management Unit of Waterways will organize its own Environmental Unit who will be responsible in monitoring the execution of the Environmental Management Plan.

When the proponent has decided to invest, project representatives will coordinate with construction contractors to implement environmental protection works strictly in accordance with the provisions of the State regulations. Representatives of PMU-W will also formulate measures as needed to further facilitate environmental management and enhance awareness among the project personnel and construction workers on environmental protection. The investor will work closely with the local authorities and provincial agencies of Phu Tho, Nam Dinh and Ninh Binh in the environmental protection work.

Environmental Unit of Project Management Unit

The Environmental Unit organized by the Project Management is responsible for the environmental problems of the project in accordance with policies and procedures, controls the implementation of measures for environmental protection, execution of contracts for sub-contractors, and consultants effectively. Environmental Unit is responsible for receiving information from the construction supervision consultants and contractors, handling and reporting with the Project Management Unit.

Construction Supervision Consultants

Construction Supervision Consultants (CSC) includes environmental engineers with experience on environmental monitoring. They will provide assistance to the Environmental Unit (EU) for timely implementation of the proposed measures to protect the surrounding environment. The CSC will advise contractors of construction to prepare and implement the Contractor's Environmental Protection Plan/EMP. Close monitoring will be done by the CSC to check the compliance of the engineers and construction workers on the implementation of the EMP.

To minimize pollution during the course of construction, monitoring activities should be implemented at locations (short or long-term) identified by the Consultant and/or PMU-W during the course of construction. A Construction Supervision Framework is presented below which will be used as guide relative to the performance of their responsibilities.

Table C.2- Construction Supervision Framework

Issue	Location: Where is the issue?	Parameter: What is being overseen?	Procedure: How is the issue managed?
Noise	Construction site Project –adjacent communes	Level of noise being generated during construction (every hour and daily bases) Frequency of disturbance to local villagers	Audio-Visual observations Report forms Monthly reporting to PMU-W, local authorities, as required
Dust	Construction site Access Roads	Concentration of dust generated during construction activities Exploitation of water resources for spraying	Daily observations Incident reporting Monthly reporting to PMU-W, local authorities, as required
Management of hazardous materials (fuels, lubricants, explosives, etc.)	Hazardous materials storage site	Storage facility location, security and maintenance	Inventory checklists Reporting incidents or accidents Quarterly reporting to PMU-W, local authorities, as required
Solid waste	Designated landfill Construction site Camp sites	Amount of waste generated at construction and camp sites Amount of waste disposed at the landfill Recycling of material Littering and contamination of environment	Waste tracking sheets or register Incident reports Monthly reporting to PMU-W, local authorities, as required
Sewage waste	Construction site services Camp site services	Quantity and quality of sanitation services provided Misuse of sanitation services	Daily checklists Incident reports Monthly reporting to PMU-W, local authorities, as required

Issue	Location: Where is the issue?	Parameter: What is being overseen?	Procedure: How is the issue managed?
		Inappropriate disposal of human waste	
Potable Water	Construction site Camp site	Misuse of water reserves Misuse of natural water sources Contamination of water resources	Daily checklists Incident reports Monthly reporting to PMU-W, local authorities, as required
Construction equipment and vehicle maintenance	Construction site Vehicle/equipment storage area Access roads	Vehicles/equipment operating at standard levels Excess oil, fuel, lubricant leaks and gas emissions Disorderly conduct or misuse of equipment / vehicles	Daily checklists Incident reports Quarterly reporting to PMU-W, local authorities, as required
Worker Code of Conduct and Safety	Construction site Camp site	Safety, security and orderly conduct of construction workers Accidents and unplanned events Conflict with local villagers	Environmental and safety meetings held regularly Incident report forms Quarterly reporting to PMU-W, local authorities, as required

d) Contractor

In addition to complying with legal documents, the contract is the best way of forcing contractors to implement mitigation measures stated in the Specification of Project. Based on the recommendations in EIA, specification, contractor will prepare their own environmental management plan for bidding. After getting bid acceptance, construction contractor have to fulfil the contract terms of environmental aspects and their commitments in the environmental management plan under the supervision of the construction supervision consultant and Project Management Unit.

The Contractor is responsible for undertaking directly or by contract to appropriate groups, all monitoring activities. The type of monitoring equipment must be approved by the Consultant. Results of all monitoring surveys must be reported to the Consultant

e) Sub- consultant

Sub - consultant is the agency or an individual hired by the proponent to undertake the sampling and analyses of parameters to determine the environmental quality of the subject area.

Summary of Roles and Responsibilities

The summary of the roles and responsibilities of each environmental management team/personnel specifically during construction phase is enumerated in Table C.3.

Table C.3: Summary of Roles and Responsibilities

Organization	Responsibilities
Project Management Unit for Waterways (PMU-W)	<p>Sign contract with consultant.</p> <p>Organize the Environmental Unit *(EU) responsible for the environmental aspects of the project.</p> <p>* The Environmental Unit of the project shall be composed of representatives from the Ministry of Transport/MOT/PMU, Department of Natural Resources and Environment of Phu Tho, Nam Dinh and Ninh Binh Provinces.</p> <p>Allocate budget for environmental monitoring activities during pre-construction and construction stages of the project.</p> <p>Endorse/submit the monthly and annual reports to the Provincial or Local People's Committees, as well as to the Ministry of Natural Resources and Environment.</p>
Environmental Unit(EU)	<p>Make sure all the proposed terms and conditions of environmental protection in the Bid Documents are included in the Project Contract.</p> <p>Review and analyze reports on environmental monitoring during project construction stage</p> <p>Conduct periodic inspection of construction activities to ensure the full implementation of the EMP by the contractor as specified in the contract. In cases where the provisions are not implemented, the Environmental Unit shall be responsible for reporting the matter directly to the Project Director, who has the right to suspend the work of contractors.</p> <p>Coordinate with the Construction Supervision Consultant (CSC) regarding the Contractors/Sub-Contractors compliance with EMP.</p> <p>With the assistance of the CSC, prepare monthly and annual reports.</p>
Construction Supervision consultant (CSC) Or	<p>Coordinate with the Environmental Unit (EU) and the Project Contractors to ensure the full implementation of measures for environmental protection as written in the project contract and the contractor's commitment in the Environmental Management Plan (EMP).</p> <p>Issue site instructions to the contractor for any potential environmental issues</p>

Construction Supervisor	<p>observed that may hinder the progress of the project.</p> <p>Receive and review the monthly monitoring reports of the Contractor/Sub-Contractors.</p> <p>Prepare quarterly reports and submit to PMU/EU at least 25th of the 3rd month of each quarter.</p>
Project Contractor	<p>Responsible in the full implementation of measures for environmental protection as specified in the contract and their commitment in the Environmental Management Plan (EMP)..</p> <p>Coordinate with the CSC should there be environmental issues to be discussed.</p> <p>Must ensure that their hired sub-contractors also must do full implementation of measures for environmental protection which was signed in the contract of the project and their commitment in the Environmental Management Plan (EMP).</p>
Sub-consultant	<p>Conduct environmental monitoring.</p> <p>Directly report the monitoring results to the CSC within one week from the date of sampling. These results will be reviewed by appropriate staff.</p> <p>Carry out additional tests as requested.</p>

Specific Tasks

Specific tasks in the environmental management plan in pre-construction and construction stages of the project include the following:

Manage the implementation of the proposed mitigation measures during the pre-construction and construction activities;

Plan the progress of construction work items;

Schedule machinery and equipment installation and its maintenance;

Prepare and manage the implementation of the Traffic Management Plan during construction;

Prepare and manage the implementation of the Occupational Health and Safety Plan during construction.

Manage plans to prevent environmental incidents. Prepare and implement the Emergency Response Plan.

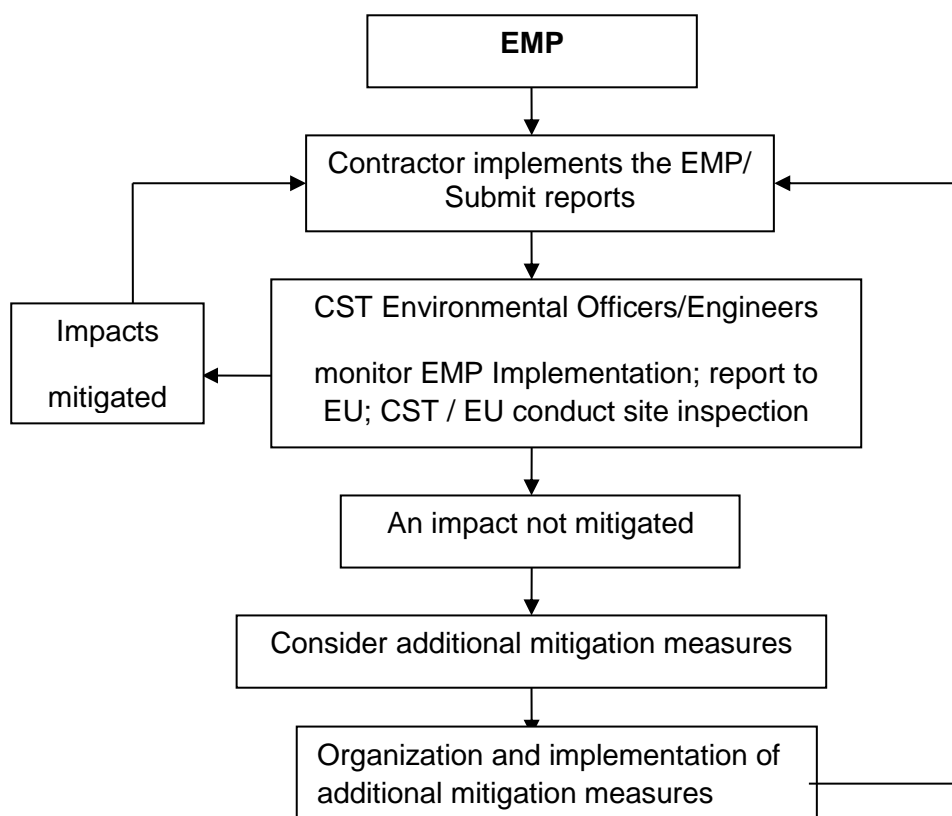
Manage the implementation of the Dredged Materials Disposal Plan, the Solid Waste Management Plan for other construction wastes e.g. recyclable, residual and hazardous wastes;

Minimize the generation of wastewater. Manage the handling, treatment (if necessary) and disposal of effluent.

Mechanism and Procedure of Implementation of Project Environmental Management Plan

Illustrated in Figure 6 is the mechanism and procedure for the implementation of the environmental management plan.

Figure 6. Mechanism and procedure of implementation



(*) Environmental monitoring units of the project are the Ministry of Transport, Department of Natural Resources and Environment of Phu Tho, Nam Dinh and Ninh Binh Provinces.

Data Review Procedures

Sampling, testing and analysis will be undertaken by the Contractor directly or as a contract to a qualified local environmental monitoring group. Field and laboratory results will be reported to the PMU-W and the Consultant within one week of collection. These results will be reviewed by appropriate staff.

Various mitigation measures have to be adopted by the project to reduce identified impacts. These measures will form part of the project activities. In addition, where monitoring programs define conditions of “unacceptable impact” or exceedance of criteria, the PMU-W will review the exceedances and discuss operational issues with the Engineer for that project section. As appropriate, the Contractor or PMU-W will institute further mitigation measures. These additional measures may be short-term or long-term, depending on the nature, scope and timing of the exceedance.

The PMU-W will provide, on a monthly basis, the results of monitoring and implementation of mitigation measures to the Provincial or Local People’s Committees, as well as to the Ministry of Natural Resources and Environment. Further, PMU-W will provide an annual summary report of

monitoring and implementation of mitigation measures to the Provincial and Local People's Committees and the Ministry of Natural Resources and Environment.

Impacts on water quality

In this and subsequent discussions, an exceedance of 10% or 20% has been taken as "significant" and therefore providing a reason for implementing further mitigation measures. These criteria are arbitrary, but are based on similar monitoring criteria used in China and Canada.

Criteria defining unacceptable impact are:

In the Waterways, if there is more than 20% reduction in dissolved oxygen or an increase of more than 50 mg/L of Total Suspended Solids at either or both monitoring transects in the Waterways for two consecutive sampling events during any one week of dredging.

If unacceptable conditions occur, PMU-W will instruct the Contractor to alter dredging activities and thereby reduce release of suspended solids and associated contaminants by one or more of: (a) reducing intensity of dredging; (b) changing dredging operational practices; or (c) deploy a silt curtain around the operation. If monitoring indicates exceedances are still being experienced, PMU-W will review Contractor's operations in more detail and provide direction to the Contractor; e.g., change definition criteria, increase the monitoring effort to better evaluate conditions while permitting exceedance, evaluating dredging methodology, or re-evaluating site conditions.

Impacts related to land-based disposal

Criteria defining unacceptable impact are:

If there is an increase of more than 50 mg/L of Total Suspended Solids at either or both monitoring transects in the Waterways for two consecutive sampling events during any one week of dredging.

If unacceptable conditions, PMU-W will instruct the Contractor to:

- reduce the rate of water discharge from the land-based disposal facility;
- direct the discharge water into a secondary holding pond to permit further settling before discharge to the Waterways;
- Install a silt curtain at the discharge to promote settling of suspended solids while permitting (restricted) flow of water (the silt curtain to be installed in the drainage channel).

Discharge from a disposal site will only be halted if, after implementing these mitigation options, monitoring still indicates exceedance. At that time, PMU-W will further review Contractor operations and provide direction to modify the activities.

Noise impacts

Criteria defining unacceptable impact are:

- Persistent noise (lasting longer than 1 hour) greater than 10 dB above the maximum allowable for that district and time of day.
- Abrupt event noise greater than 15 dB above the maximum allowable for that district and time of day with the event lasting no longer than 1 minute at the impact boundary.

If unacceptable conditions are reported, PMU-W will instruct the Contractor to reduce noise levels to meet monitoring criteria. This may require the Contractor to install additional noise dampening. Alternatively, PMU may require the Contractor to alter the timing of certain work practices to meet criteria. If the further monitoring indicates unacceptable impact, PMU-W will further review site activities and provide direction to the Contractor.

Communication and Reporting

The following section describes the communication and reporting mechanisms to be implemented as part of the EMP.

i) Communication

Table _ describes the lines of communication for construction workers, local villagers, employees and other project-related individuals with respect to filing grievances or incidences throughout the construction and operation of the DNC.

Table 5.4 Communication Pathway

Stakeholder	Potential Interest / Concern	Means of Contact	Key Contact
Local villagers (displaced, resettled, downstream water user)	Adequate compensation package (financial assistance, food cache, water reserves, etc.) Disturbance from construction camp and associated activities (drugs, alcohol, prostitution, disease, etc.) Loss of productive lands, fisheries, etc. Access to community services (medical, education, telephone, market, etc.) Maintenance of cultural heritage Safety and security of local villages	Complaints/concerns shall be communicated to local village leaders and authorities Information broadcasts and project updates shall be provided by the Contractor to local village leaders	Social Safeguard Team of PMU-W

Stakeholder	Potential Interest / Concern	Means of Contact	Key Contact
	and communes Project updates Information broadcasts on potential hazards (blasting, road closures, reduced river access, etc.)		
Potential employees	Employment opportunities Adequate resources (food, water, etc.) and shelter Competitive wages	Recruitment of locals at the project site and through word of mouth Issues shall be conveyed to site foremen	Contractor
Government stakeholders	Chronic environmental and socio-economic impacts	Monitoring Committee	PMU-W
Construction workers and camp sites	Workers code of conduct Social conflicts between local villagers and workers Behavior issues (gambling, drugs, etc.) Environmental issues (exploitation of natural resources, etc.)	Weekly meetings with construction workers Individual meeting with disorderly workers	Contractor

ii) Reporting

Reports shall be produced through the course of implementation of monitoring programs, collecting incident/grievances forms, consulting with local villages and project-affected communes and auditing performance of existing programs/mitigation measures within the EIA and EMP. Table 5.5 describes the types of reports that shall be produced.

Table 5.5 - External Reporting Schedule

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
Contractor & Workplace Safety and Environmental	Accidents/Incident Report	Filing/notification of accidents or unplanned events	Within 24 hours of the incident	PMU-W/CST

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
Officer	Non-compliance Report	Detail the cause, nature and effect of any environmental and/or socio-economic non-compliant act performed	Within one week of the event	PMU-W/CST
	Chance Discovery Report	Documentation and registry of newly discovered artifacts	Within 24 of archaeological site, old human remains or artifact	PMU-W/CST Government Ministry
	Monthly Compliance Report	Report to the Construction Supervision Team	Report of compliance and non-compliance measures on a monthly basis	CST
Construction Supervision Team	Daily Compliance Checklist	Checklist of environmental and social compliance of construction	Daily	Internal
	Monthly Compliance Report	Monthly report of compliance within 10 days of receipt of report from Contractor	Monthly	PMU-W
Project Environmental Officer & Independent Environmental Monitoring Consultant	EMP updates, including any changes in management or monitoring procedures	For approval prior to implementation	As required, prior to implementation	PMU-W
	Key changes in project activities that may trigger Environmental Approvals	Ensure compliance with environmental regulatory approvals	As required, prior to implementation	PMU-W
	Environmental monitoring	Notification of non-compliance with standard	Dependent on environmental	PMU-W

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
	reports	environmental guidelines and parameters	parameter: weekly, monthly, quarterly or annually	
Social Safeguard Team of Project Management Board	Resettlement Development Plan	Ensure resettled transition successfully into resettled sites	On-going	PMU-W, MOT, World Bank

The PMU-W will provide the World Bank with report updates. Frequency of reporting to the World Bank will vary depending on the nature of the non-compliance and monitoring schedule.

5.1.4 Capacity Building and Training on Environmental Management

Environment management of inland Waterways projects is relatively a new task for Vietnam Transport Sector. Ministry of Transport through the Project Management Unit of Waterways (PMU-W) will establish an Environmental Unit (EU) to oversee the preparation, implementation and oversight of the EMP and its associated plans. It is essential that capacity building and training be provided for the members of the EU and other staff who will be involved in the implementation of the EMP prior to project implementation. The objective of the training is to familiarize the management staff with environmental management and procedures for environmental monitoring and reporting. The training can be conducted by one of the environmental centers involved in environmental impact assessment and environmental management.

The training will include the following components:

Training for PMU-W Staff

The training will cover, among others, the following subject matters:

- Environmental Regulations and Standards of Vietnam
- Principles and procedures for environmental impact assessment
- Fundamentals of environmental management
- The Environmental Management Program for NDTDP Phase 2
- Environmental issues related with Waterways improvement and operation

- Environmental monitoring methods and procedures
- Environmental Reporting (includes report preparation and interpretation of laboratory results)
- Training for Construction Engineers

The following training programs will be provided for engineers of the contractors:

- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management;
- Environmental Management Plan of the Project: Orientation of engineering staff on the environmental management plan for NDTDP Phase 2 particularly the following:
 - Air, noise, soil and water sampling procedures;
 - Fundamentals of aquatic ecology
 - Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
 - Waste management;
 - Fuel and hazardous materials management;
 - Construction camp management;
 - Community relations and public consultation procedures; and
 - Labor Safety: Regular training on safety issues related to the river works and dredging;
 - Monitoring and reporting of EMP: The training will include the methodology for site observation and reporting of monitoring results.

Training costs are estimated below:

Table 5.6. Indicative Estimated Cost for Training Activities

No.	Training	Items	Estimation (1000 VND)	Cost (USD)
1	Safety training (in the Construction phase)	Consultant's manpower requirement	10000	485
		Per diem for 40 participants	24000	1165
		Other expenditures: classroom, stationery	28800	1398
2	Training on environmental protection related to inland water (in the Construction phase)	Consultant's manpower requirement	10000	485
		Per diem for 40 participants	24000	1165
		Other expenditures: classroom, stationery	28800	1398
3	Training on environmental monitoring and reporting (in the Construction phase)	Consultant's manpower requirement	10000	485
		Per diem for 30 participants	24000	1165
		Other expenditures: classroom, stationery	28800	1398
Total			188,400	9144

Environmental Monitoring Program

Environmental monitoring program of the project is to assist the State management agencies to monitor the work on environmental protection during construction works as well as during subsequent operations of the project, thus ensuring the effectiveness of measures to reduce environmental pollution. Based on monitoring and evaluation of the project's impact on the environment, potential threat to the environment due the activities of the project can be minimized if not totally prevented. It also provides venue to make improvement or alter the planned mitigation measures to cater the project needs to lessen its impacts.

Environmental monitoring program will be conducted in three (3) phases: pre-construction (baseline environment) if the project commenced after a year, during the construction period (proposed for a year) and operation phase of the project (first year).

Other Monitoring Activities Due to Project-Related Activities.

Monitoring for Social Impacts

Monitoring of Resettlement Action Plan (RAP) or Resettlement Plan (RP)

Regular monitoring of RAP implementation will be conducted by PMU and by the International Donor (WB), as well as by an independent external monitoring agency.

Internal Monitoring

The Resettlement Department of PMU-W, with the assistance of supervision consultant teams, will be responsible for internal monitoring of RAP implementation.

Monitoring Indicators

The main monitoring indicators are:

- Payment of compensation to PAPs in various categories, according to the compensation policy described in the RAP,
- Public information dissemination and consultation procedures
- Adherence to grievance procedures,
- Resettlement site location, design, site construction and plot allocation
- House construction, technical assistance, payment of subsistence and shifting allowances as described in the RAP,
- Employment generation through project implementation and priority of PAP for the options offered,
- Provision of training and credit availability,

- Co-ordination and completion of resettlement activities and commencement of civil works.

Staff for Conducting Internal Monitoring

The staff of PMU-W will carry out the internal monitoring activities. They will collect information every month from the Provincial Resettlement Committees (PRCs) and District

Resettlement Committees DRCs. A database of resettlement, monitoring information about the project will be maintained and updated every month.

Reporting

PMU-W will submit to WB and Government Authority a monitoring report on the progress of implementation of the RAP every six month.

Monitoring for Land Use Change

The change in land use due to disposal of spoils will be monitored. The original land use shall be described and the resulting changes, after emplacement of spoils will be noted. For temporary spoils holding area, monitoring of land use after spoils have been removed should be done. The objective of the monitoring is to document the changes and the restoration of the land use after removal of spoils. This will have to be done in all the disposal sites.

This activity should be part of the regular monitoring work of the environmental section of PMU-Environmental section.

Monitoring for Impacts on Occupational Health & Safety

The monitoring for occupational health and safety should be done regularly. The monitoring should cover:

- Compliance by contractor with occupational health and safety plan:
- Adherence by workers with the safety guidelines
- Use of PPE by workers, including floatation devices by those working in water
- Presence of emergency first responder
- Availability of first aid station in construction site;
- Reported number of accidents or incidents involving lost time
- The monitoring shall be implemented by PMU-W environmental staff.

Table 5.7 – SEMP Schedule

Plan or Activities	Sub - Plan	Project Phase															
		Pre-Construction				Construction								Operation			
		Year 1				Year 2				Year 3				Year 4			
		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Prepare SEMP Implementation Plan																	
Form Environmental Unit																	
Prepare bid specification																	
Construction Impact Management Plan	Plan Implementation																
	Construction supervision																
Environmental Disposal Plan	Preparation																
	Implementation																
Environmental Monitoring Plan	Preparation																
	Implementation																
Social Development Plan	Preparation																
	Implementation																
Training Plan	Preparation																
	Implementation																