

Environmental Monitoring Report

Bi-Annual Report
May 2010

VIE: Ho Chi Minh City–Long Thanh–Dau Giay Expressway Project

Prepared by Consortium of Nippon Koei Co., Ltd. TEDI South for the Ministry of Transport and the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 30 April 2010)

Currency unit	–	dong (D)
D1.00	=	\$0.000052
\$1.00	=	D18,975

ABBREVIATIONS

ADB	–	Asian Development Bank
BOD	–	biological oxygen demand
CASE	–	Center for Analytical Services and Experimentation of Ho Chi Minh City
CEPT	–	center for environmental protection in transportation
COD	–	chemical oxygen demand
DONRE	–	Department of Natural Resources and Environment
EIA	–	environmental impact assessment
EMP	–	environmental management plan
GOV	–	Government of Vietnam
HCMC	–	Ho Chi Minh City
JBIC	–	Japan Bank for International Cooperation
MONRE	–	Ministry of Natural Resources and Environment
NTP	–	notice to proceed
SS	–	suspended solids
VEC	–	Vietnam Expressway Corporation

NOTE

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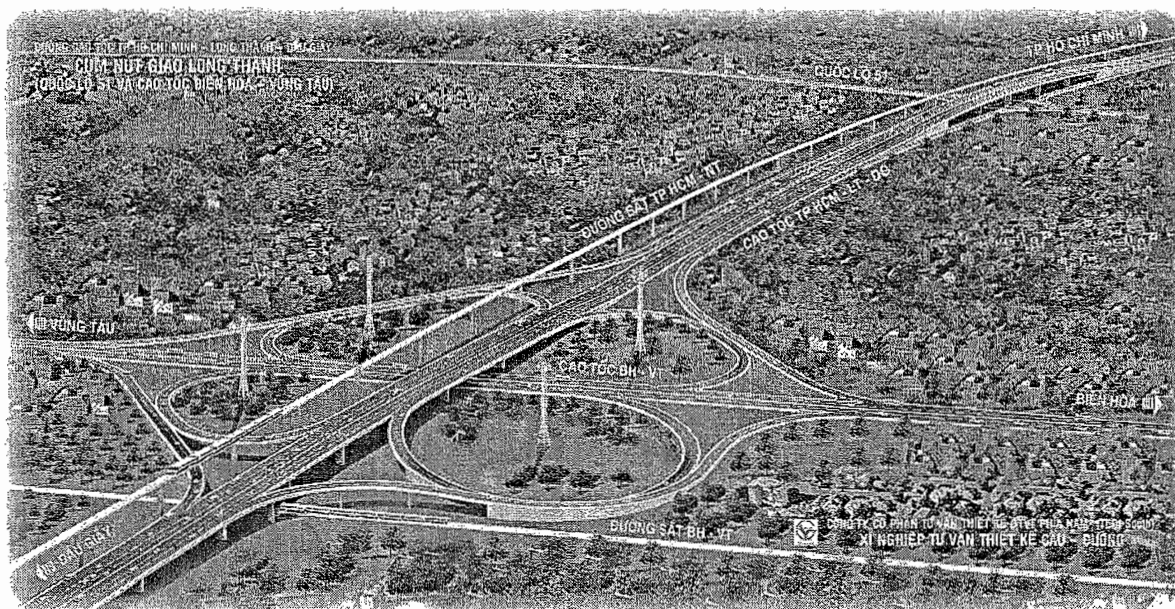


THE SOCIALIST REPUBLIC OF VIET NAM
MINISTRY OF TRANSPORT
VIETNAM EXPRESSWAY CORPORATION
SOUTHERN EXPRESSWAY PROJECTS MANAGEMENT UNIT (SEPMU)



North-South Expressway Construction Project Hồ Chí Minh City - Dầu Giây Section (CS)

LOAN NO. VNXV-1



ENVIRONMENTAL SUPERVISION REPORT (December 2009 - May 2010)

May 2010

Consortium of
Nippon Koei Co., Ltd
TEDI South

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CHAPTER 1: INTRODUCTION

1.1 Background and objectives

In the surrounding area of Ho Chi Minh City (HCMC), the traffic volume has long been over the capacity of road. It is foreseen that the demand of traffic in HCMC and Dong Nai area where industrial development has been recently significant with the planned development of industrial zones and the international airport will increase significantly. The Government of Vietnam (GOV) has decided to construct the HCMC – Long Thanh - Dau Giay Expressway (HLD Expressway) with the assistance from Asian Development Bank (ADB) and Japan Bank for International Cooperation (JBIC), which was currently named as Japan International Cooperation Agency (JICA) by integrating with previous JICA. The express way was divided into two portions such as HCMC – Long Thanh funded by JICA and Long Thanh - Dau Giay funded by ADB.

Ho Chi Minh –Long Thanh –Dau Giay Expressway crosses thinly population density areas such as agricultural land and some high population density areas. EIA has been implemented for environmental and social consideration according to the Vietnamese environmental law and regulations and JBIC guidelines for Environmental and Social Considerations.

Implementation of Environmental Management Plan (EMP) during construction and post-construction stages is necessary for sustainable development as well as to ensure the environmental protection in the road construction project.

The main purpose of the environmental supervision report (December 2009 – May 2010) is to summarize the environmental supervision activities by Construction Supervision Consultants (CS Consultants) during the period of December 2009 –May 2010 to support VEC to prepare environmental supervision reports to JICA (previous JBIC) as well as to prepare them to other agencies.

The main objectives of this environmental supervision report are follows;

- Grasp the general environmental condition
- Identify the environmental impacts during the construction period
- Summarize the result of environment inspection during construction period.
- Implementation of environmental monitoring in pre-construction during construction and operation stages

HLD Expressway construction project with total length of about 55km, is divided into 2 parts; Part 1: From An Phu Intersection (beginning point) to Ring Road 2 intersection (Km4+000) will be constructed as urban road. This section is funded by Hochiminh City People Committee; Part 2: From Ring Road 2 intersection (Km4+000) to Dau Giay Intersection (ending point). The Project scope is summarized in following table.

Table 1. Project Scope

Section	Distance (Km)
Ring Road 2 intersection to NH-51 interchange (JICA portion); KM.4+000 to KM.23+900	19.900 km
NH-51 interchange to Dau Giay interchange (ADB portion); KM.23+900 to KM.54+982	31.082 km
Total	50.982 km

CHAPTER 2: Briefing of Environmental Management Plan (HCMC – Long Thanh)

2.1 Implementation arrangement of EMP

The EMP including the explanation of baseline condition at pre-construction and potential impacts and mitigation measures at construction stage and operation stage

EMP has been prepared to monitor the environmental impacts and implement the appropriate mitigation measures during construction and operation stages as required in the EIA. The frameworks of management are described in the following figure.

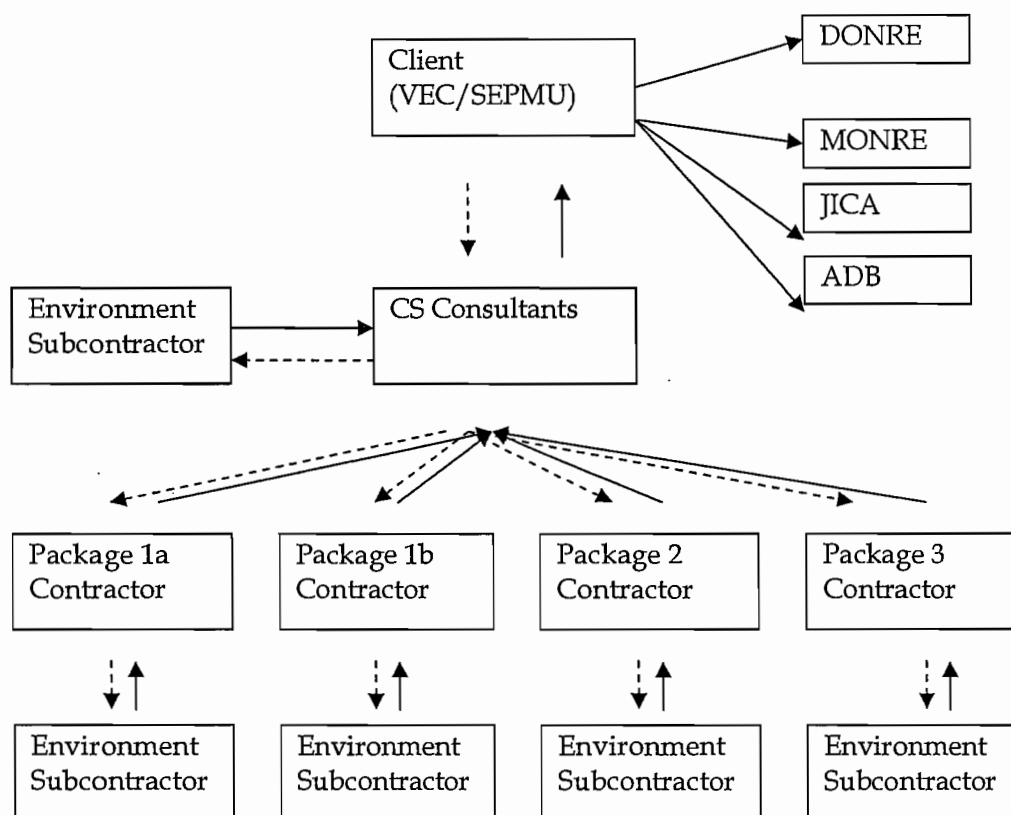


Figure 1. Framework of organizations regarding environmental management

2.2 Environmental Management

2.2.1 Environmental Monitoring

(1) Monitoring Items

Monitoring items include air quality, noise, vibration, surface water quality, groundwater quality, soil and wastewater (The detail is described in section 5.1 Environmental Monitoring).

(2) Environmental reference standards

The environmental standards to be referred were updated in line with recent Vietnamese standards from the EMP as follows.

Table 2. Environmental standards

No	Environmental component	Environmental standard
1	Air quality	QCVN 05:2009/BTNMT “ National Technical Regulation on ambient air quality” QCVN 06:2009/BTNMT “ National Technical Regulation on hazardous substances in ambient air”
2	Noise	TCVN 5949-1998 “ Acoustic – Noise In Public And Residential Areas- Maximum Permitted Noise Level”
3	Vibration	TCVN 6962:2001 Vibration and shock – Vibration emitted by construction works and factories – maximum permitted levels in the environment of public and residential areas TCVN 7210:2002 Vibration and shock – vibration emitted by roads traffic-maximum limits in the environment of public and residential areas
4	Surface water	QCVN 08:2008/BTNMT “ National Technical Regulation on surface water quality”
5	Ground water	QCVN 09:2008/BTNMT “ National Technical Regulation on groundwater quality”
6	Soil	QCVN 03:2008/BTNMT “ National Technical Regulation on soil quality”
7	Wastewater	QCVN 14:2008/BTNMT “National Technical Regulation on domestic waste water” QCVN 44:2009/BTNMT “National Technical Regulation on industrial waste water”

(3) Monitoring Locations

Monitoring locations of air, noise, vibration, surface water, groundwater and soil are selected for most affected areas during construction and operation stages. The monitoring of wastewater will be carried out during only construction stages for affected area. The monitoring locations are summarized as following table. Map of sampling location is presented in the Appendix 1.

Table 3. Monitoring location

Location	1a	1b	2	3
Air, Noise, Vibration				
1. Intersection Nguyen Duy Trinh Str with HLD Expressway	6+150			
2. Truong Khanh Shrine (Near Residential Area)			11+300	
3. Long Thanh town near NH51				23+300
Surface Water				
1. Ong Nhieu river (Ong Nhieu bridge)	7+100			
2. Tac river (Song Tac bridge)		10+400		
3. Dong Nai river (Long Thanh bridge)			12+600	
4. Dong Mon bridge (Dong Mon river)				21+350
Groundwater				
1. Tan Dien A Hamlet – Phu Huu (District 9)	5+250			
2. Long Phuoc Ward, near Dong Nai river		10+400		
3. Long Thanh Town				23+300
Soil				
1. Phu Huu Ward, District 9, HCMC (Land bank)	4+200			
2. Truong Khanh ward, district 9			11+300	
3. Long Thanh Town				23+300
Wastewater	-	-	-	-

(4) Monitoring Schedule

The environmental monitoring is quarterly carried out during the construction stage and semiannually during the defect liability period of operation stage. The environmental monitoring schedule described in the EMP is summarized as follows.

Table 4. Monitoring schedule

Year	Month	Package 1a	Package 1b	Package 2	Package 3
2009	12	X/1 (Initial Survey)			

2010	3	X/2	X/1 (Initial Survey)	X/1 (Initial Survey)	X/1 (Initial Survey)
	6	X/3	X/2	X/2	X/2
	9	X/4	X/3	X/3	X/3
	12	X/5	X/4	X/4	X/4
2011	3	X/6	X/5	X/5	X/5
	6	X/7	X/6	X/6	X/6
	9	X/8	X/7	X/7	X/7
	12	X/9	X/8	X/8	X/8
2012	3	X/10	X/9	X/9	X/9
	6	X/11	X/10	X/10	X/10
	9	X/12	X/11	X/11	X/11
	12			X/12	X/12
2013	3	X/13	X/12	X/13	X/13
	9	X/14	X/13	X/14	X/14
2014	3	X/15	X/14	X/15	X/15
	9		X/15	X/16	X/16
2015	3			X/17	X/17



: Construction period (PK-1a & 1b=32 months, PK-2 & 3= 36 months)



: Operation period (Defect liability Period=24 months)

X/No : The month when the environmental monitoring will be conducted.

2.2.2 Environmental Supervision

In the EMP, mitigation measures are proposed. The CS consultants are required to monitor, supervise whether the contractor apply the appropriate mitigation measures and implement environment protection by utilizing environmental protection

equipment and/or facilities or not during the construction activities activity to protect the surrounding environment. The main mitigation measures described in the EMP to be supervised are briefly summarized as following table.

Table 5. Summary of mitigation measure

Item	Contents
Air quality	Dust suppression measures such as water spray and proper storage, etc
Water quality	Erosion control, Proper treatment of wastewater from facilities such as batching plant, installation of septic tank or other suitable procedure, etc
Noise and vibration	Install of permanent noise barrier, construction of temporary noise barriers
Waste disposal	Licensed waste transporter and/or disposal site for unsuitable soil, utilization of recycled waste, solid waste collection and disposal, proper handle of hazardous waste, etc
Wastewater	Wastewater collection and treatment, etc
Social aspect	Regular consultation with surrounding residents or community, construction camp management, etc
Traffic management	Proper material transportation routes and schedule, etc
Safety provision	Safety management plan, etc

CHAPTER 3: Construction Activity during Reporting Period

VEC issued NTP (notice to proceed) to packages (Pk) 1a, 1b, 2, and 3. The construction activity so far is carried out mainly in package 1a and 1b, which is summarized as following table;

Table 6. Summary of construction activities

No	Item	Pk1a	Pk1b	Pk2	Pk3
1	NTP	1 st Dec. 2009	1 st Jan. 2010	4 th May 2010	4 th May 2010
2	Environmental management plan	Approved	submitted on 28 th Apr. 2010 but under revision	Under preparation	Under preparation
3	Site office	officially opened and under operation since Nov 2009	officially opened and under operation since Apr 2010	under construction	under construction
4	Site laboratory	under operation	Under mobilization, operation start within May 2010	not yet started	not yet started
5	Batching plant	The construction of plant has been completed	Completed preparing area included sand filling	not yet started	not yet started
6	Casting yard	Casting bed construction is on going, Foundation treatment of storage yard is on going	Completed preparing area included sand filling	not yet started	not yet started
7	Temporary Road Construction	Sand backfilling: 79%, Embankment: 52%	Sand backfilling: 72%, Embankment: 22%	Sand backfilling: 19%	not yet started
8	Test pile/trial mix	Implemented static load test with ultimate load on Non-working pile, and construction of Non-working	Construction of Non-working test pile with “RDR method, bucket type” and Ultimate static loading test were completed.	Not yet started	Method statement for trial section in DMM vacuum consolidation method is in

		test pile with NCD method. Trial mix is not yet started.	Trial mix is not yet started.		progress
9	Permanent work	Embankment works from Km4+000 to Km4+231 are on going	Not started yet	Not started yet	Not started yet

CHAPTER 4: Summary of Contractor's Environmental Monitoring Report

According to the Clause 2 - Environmental Monitoring - Section 01300 – Volume 3 of Tender Document, the contractor will implement environmental monitoring work in two phases: prior to the start of construction and during construction. Since the NTP for package 1b, 2, and 3 has been issued recently and construction activities is in preparation stage, these contractors are preparing the monitoring plans and will promptly implement the plans after approval from SEPMU and CS Consultants. Meanwhile, Pk1a Contractor already carried out the initial monitoring in March 2009.

Table 7. Baseline environmental monitoring plan of package 1a

No.	Environmental component	Monitoring point	Frequency	
			Pre-construction phase	Construction phase
1	Air (3 samples/point/monitoring)	3 points Km 4+400 Km 6+150 Km 7+400	One time	quarterly
2	Noise (3 samples/point/monitoring)	3 points Km 4+400 Km 6+150 Km 7+400	One time	quarterly
3	Vibration (3 samples/point/monitoring)	3 points Km 4+400 Km 6+150 Km 7+400	One time	quarterly
4	Surface water quality (2 samples per monitoring at low & high tide)	3 points Km 4+440 Km 5+480 Km 7+100	One time	quarterly
5	Ground water quality (one sample per monitoring)	1 point Km 6+200	One time	quarterly
6	Soil quality (one sample per monitoring)	1 point Km 4+450	One time	quarterly

The monitoring result is summarized as follows:

- Air quality: Except that TSP of one measuring at Km 6+150 (intersection with Nguyen Duy Trinh street) was higher than limited value of QCVN 05:2009/BTNMT, concentrations of TSP, SO₂, NO₂, CO, Pb monitored in three sampling points of other measurement were under allowable values.
- Noise level: Noise levels at three sampling points (km 4+400, km6+150, and km7+400) from 22h00 to 23h00 were 50.7 dB, 61.4 dB, and 55.8 dB, higher than allowable value of 50 dB of TCVN 5949-1998. Other measured noise levels were

under the allowable value.

- Vibration level: All the measured values were under allowable value of 70 dB in the Vietnamese standard TCVN 7210-2002.
- Surface water quality: surface water quality at km7+100 (Ong Nhieu River) was still good, most obtained values of parameters indicating organic compounds (such as DO, COD, BOD), nutrients (such as T-N, T-P), heavy metals, oil, Total coliform, etc. were under the limited values in National technical regulation QCVN 08:2008/BTNMT. However, water quality at the two other sampling points (km4+440 and km5+480) was slightly polluted by organic matter and microorganism. Organic compounds (BOD, COD) and total Coliform of the two points were slightly higher than the limited value.
- Ground water quality: except that pH, Fe and Coliform of the ground water were slightly higher than the limited values of QCVN 09:2008/BTNMT, all other analyzed parameters were under the limited values.
- Soil quality: concentrations of all measured parameters of the soil sample were under limited values of QCVN 03:2008/BTNMT.

CHAPTER 5: Environmental Supervision by CS Consultants

5.1 Environmental monitoring

Joint Venture of Scientific Technological Center for Environmental Protection in Transportation (CEPT) and Center for Analysis and Experimentation Services (CASE) was selected as the sub-consultant for the environmental monitoring work.. The sub-consultant has conducted two monitorings under the supervision of CS Consultants.

- The first monitoring in December 2009 covers only initial monitoring of Pk1a
- The second monitoring in March 2010 covers second monitoring of Pk1a and initial monitoring of Pk1b, Pk2, and Pk3.

Result of the two monitorings is presented in the following sections (refer to monitoring reports for more details).

(1) Package 1a (initial and second monitoring)

1) Initial monitoring

- Ambient air quality: all measured parameter (SO₂, NO₂, TSP, CO, and HC) are under the allowable values of QCVN05:2009 and TCVN5938:2005.
- Noise: Average noise level is under the allowable value of TCVN 5949-1998. However, noise level at some measuring times were higher than the allowable value due to site leveling activity of another project (there were activities of roller, crane and truck) or noise from vehicles' horn.
- Vibration: the vibration level was under the allowable value of TCVN 7210:2002
- Surface water quality: Some parameters which did not meet the QCVN08:2008 include DO, SS, grease and coliform.
- Underground water quality: pH and coliform of one sample and pH of another did not meet QCVN09:2008.
- Soil: All measured parameters were under the allowable values of QCVN03:2008.

2) Second monitoring

- Ambient Air quality: NO₂, CO, SO₂ and HC concentrations were under the allowable values of the standard (QCVN05:2009). TSP concentration was 3.7 times higher the allowable value. The high concentrations of TSP was due to activities of vehicles of a road enlargement construction on Nguyen Duy Trinh street (not expressway construction project), especially trucks for transportation of waste and construction materials. Moreover, the high temperature at the sampling

time and high wind speed (0.3 - 1.7m/s) were attributed to the problem.

- Noise and vibration levels: under allowable values.
- Surface water: All measured parameters were under allowable values of QCVN08:2008
- Underground water: pH of three underground water samples was low, from 4.54 to 4.70, and did not meet QCVN09:2008 (Ph from 5.5 to 8.5).
- Soil: The analyzed parameters were under allowable values of QCVN03:2008.
- Waste water: samples were collected at contractor's office. The result showed that BOD₅ value in one sample was 3 times higher than allowable value. The coliform value in three samples was much higher than allowable value. The wastewater volume was small but stagnant condition of wastewater (caused by sand and nylon bags and garbage blocking water flows) was suitable for coliform to develop, the highest coliform value was in the sample collected at the most stagnant point. So it is very important that constructor clean the discharge system to eliminate stagnant condition.

(2) Package 1b (Initial monitoring)

- Surface water: All parameters were under the allowable levels
- Ground water: One sample of the ground water has light smell caused by high content of Cl⁻ and Fe.

(3) Package 2 (Initial monitoring)

- Air quality: NO₂, CO and HC were under the allowable values. TSP value was two times higher the allowable value of QCVN05:2009. There were a few households and vehicles in the area but vacant lands causing wind that sweep dust making high content of TSP in this area.
- Noise and vibration: the measured levels were under the allowable levels.
- Surface water: All parameters were under allowable levels of QCVN08:2008
- Soil: All parameters were under allowable levels of QCVN03:2008.

(4) Package 3 (Initial monitoring)

- Air quality: NO₂, CO and HC concentrations were under the allowable values. TSP value was 4.8 times higher than the allowable value of QCVN05:2009. The cause of high content of TSP was mainly attributed to vehicles in this area, especially trucks and containers for goods transportation and materials between Vung Tau and Ho Chi Minh City.

- Noise: the noise level from 6pm to 10pm was 5dBA higher than allowable value due to high number of vehicle circulation in this area in night-time and the use of air horn.
- Vibration: The vibration was lower than allowable level.
- Surface water: DO, SS in one sample were higher than allowable values of QCVN08:2008. NH_4^+ concentration of all four samples was higher allowable value. High NH_4^+ concentration was probably due to effect of fertilizers used for surrounding and upstream agricultural land.
- Underground water: pH value of two samples was not in the allowable range. Cl^- in two samples were slightly higher than allowable value.
- Soil: all measured parameters were under allowable values.

The monitoring result showed that the baseline environment is under certain impacts of human activities (not construction activities of the expressway construction project), especially impacts to noise and TSP levels in the ambient air. At sampling points located at intersection with urban roads (at intersection Nguyen Duy Trinh Str with HLD Expressway and at Long Thanh Town) noise level and TSP were higher than the allowable value mainly due to impacts of vehicles (from construction and transportation activities). NH_4^+ concentration of samples collected at Dong Mon River (Pk3) was higher allowable value. That was probably due to effect of fertilizers used for surrounding and upstream agricultural land.

Presently, the project is in the beginning stage and construction activities is mainly preparation works such as temporary road, construction of site office, etc. Although the impact of the construction is inconsiderable, site inspection to all contractors was implemented regularly to supervise the environmental impacts and instruct the contractors to protect the environment. This activity is presented in the following section.

5.2 Inspection of contractor's activities

5.2.1 Package 1a

Over six months from the date of NTP, contractor has carried out preparation works including site office, temporary road, batching plant, and site laboratory. Assessment of potential impacts of these construction and mitigation measures has been implemented.

Temporary road: the road intersect with (10) waterways including nine small canals/channels and a big river (Ong Nhieu River). Method of Statement (MS) for temporary road sections over nine waterways was submitted and approved and construction of six (06) sections was completed. CS Consultants instructed the contractors to prepare MS and install proper culverts cross the waterways to avoid

blockage of water flow which could cause negative environmental impacts. The contractor also got official permission from local authorities for the construction. The MS for section over Ong Nhieu River is under preparation. In addition, construction temporary road can increase the TSP concentration in the ambient air and contractor frequently has been spraying water on the road to reduce the dust.

Site office: this building generate small amount of domestic wastewater and the discharge wastewater contained high coliform as mentioned in section 5.1. The contractor was requested to implement necessary actions including frequently cleaning discharge system and prohibiting throw of garbage into the system.

Batching plant: operation of the plant will produce wastewater containing high concentration of alkaline and other pollutants. The contractor was requested to provide a wastewater treatment facility. Method of statement of this facility was submitted and under revision.

Excavated soil: excavated soil may contents of hazardous material through construction activities or natural origin. The contractor was requested to examine the excavated soil and to take action for the proper storage, transportation and disposal with permission of local governments. The contractor proposed the disposal area and the permission from local authority is under process.

Site laboratory: the laboratory shall use hazardous chemicals. Therefore, the contractor was requested to comply with Decree No. 68/2005/ND-CP of the Vietnamese Government on Chemical Safety and other relevant regulations. Necessary prevention measures include as follows;

- Properly store and handle chemicals;
- Sufficiently provide Personal Protective Equipment (PPE);
- Provide warning notice and Material Safety Data Sheet (MSDS) for the chemicals.

In addition, disposal of hazardous chemicals shall be handled by licensed companies.

5.2.2 Package 1b

The contractor has finished some sections on the temporary road. The road intersects with three small cannels/channels and one river (Tac river). MS for these sections is under preparation. The construction of laboratory will be finished within May. Similar to package 1a, the contractor is requested to provide safety storage of chemicals especially at the laboratory as well as sufficient PPE for technicians who handle these chemicals. Wastewater treatment facility for batching plan is under reviewed. Environmental protection plan including environmental monitoring plan was submitted and under revision.

5.2.3 Package 2

Construction activities is not yet started

5.2.4 Package 3

Construction activities is not yet started

CHAPTER 6: Conclusion and Recommendation

6.1 Conclusion

- The Pk1a contractor implemented the environmental monitoring during pre-construction. The result shows that most of the parameters for air, noise, vibration and surface water, groundwater are under the current Vietnamese standards, except TSP in air quality, the noise level in night time, some water parameters in km4+440 and km5+480 and some groundwater quality parameters.
- The results of the initial environmental monitoring Pk1a, Pk1b, Pk2 and Pk3 under the supervision by the CS Consultants implemented as independent checking show that most of the result of environmental monitoring meets the environmental standards in Vietnam except TSP of air quality and noise along the road; and NH_4^+ of water quality in Dong Mon river.
- CS Consultants inspect implementation condition of mitigation measures during construction period and instruct the countermeasures to mitigate the environmental impacts regarding construction and operation of site office, batching plant, excavated soil, site laboratory, etc through the environmental inspection.

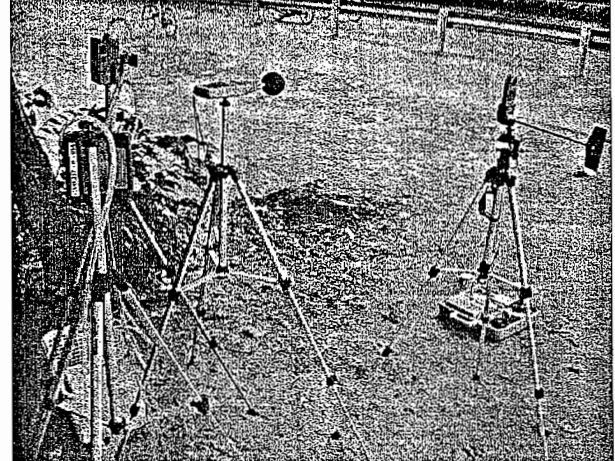
6.2 Recommendation

- In this moment, it is the beginning of the construction stage and the environmental impact is not so significant. However, it is important to monitor environment periodically and historical data shall be monitored to identify the trend of the baseline environment (under the condition without only this project) .
- There are other construction projects such as the development of Ring Road 2 or other development projects. Therefore, it is important to check the impacts of surrounding construction projects as well as of this project through the regular inspection activities.

Appendix 2. Photos of Environmental Monitoring and Supervision



Ground water sampling at Km5+250, Tan Dien hamlet, Phu Huu Ward



Air, noise, and vibration sampling at Km23+300, Long Thanh Town



Soil sampling at Km 4+200. Phu Huu ward



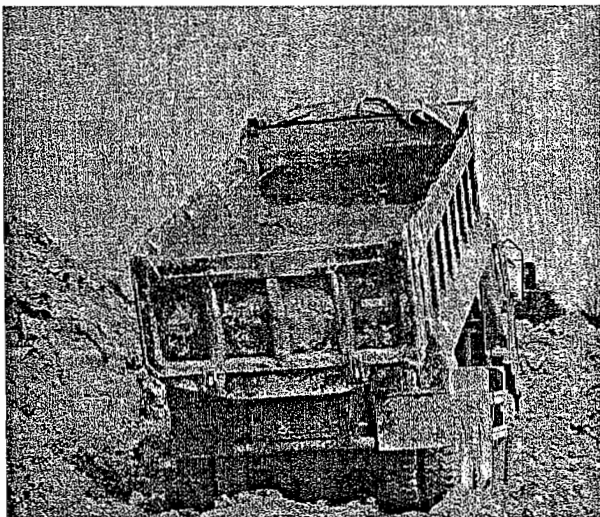
Surface water sampling at Km7+100, Ong Nhieu River



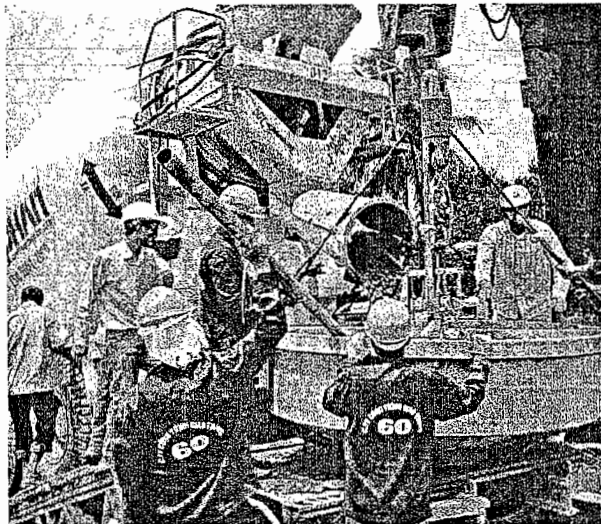
Record of sampling data for surface water at Km 21+350, Dong Mon river



Air, noise and vibration monitoring at Km 7+400 (carried out by sub-contractor of package 1a)



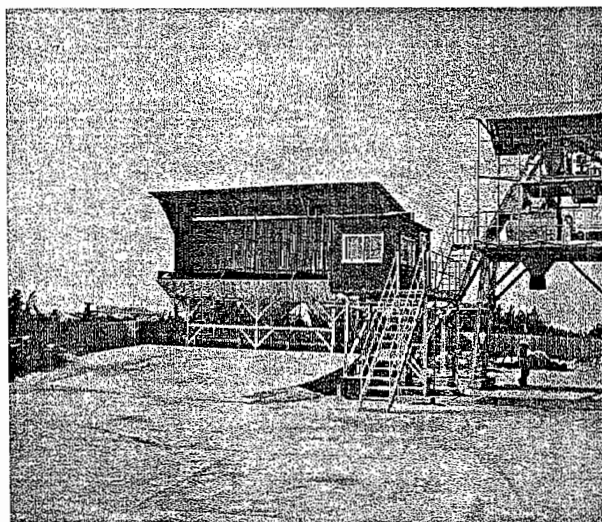
Proposed disposal area for excavated soil of
package 1a



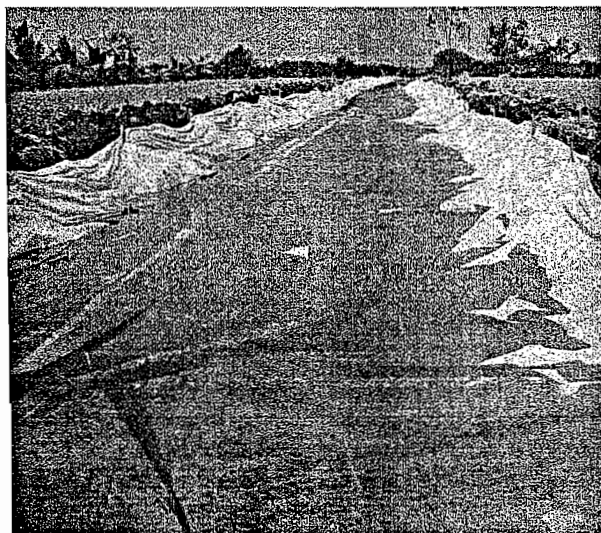
Construction of test pile of package 1a



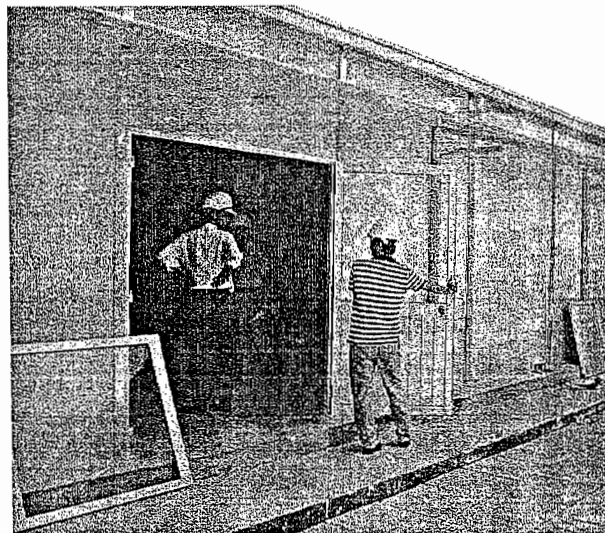
Dumping truck for excavated soil of package
1a



Batching plant of package 1a



Construction of temporary road of package 1b



Laboratory of package 1b (under construction)