

**HO CHI MINH CITY PEOPLE'S COMMITTEE
THE PMU OF HO CHI MINH CITY URBAN UPGRADING PROJECT**

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**VIET NAM URBAN UPGRADING PROJECT
HO CHI MINH CITY SUBPROJECT
COMPONENT 1 – PHASE 2**

E917

VOL. 18

**ENVIRONMENTAL IMPACT
ASSESSMENT REPORT**

**SECTORAL PROJECT No.2
(COMPONENT 1 – PHASE 2)**

**TERTIARY INFRASTRUCTURE UPGRADING FOR
LOW-INCOME AREAS IN TAN HOA – LO GOM BASIN**

**GROUP 2:
FOR LOW INCOME AREAS IN DISTRICTS 9, 12, GO VAP, BINH
THANH, PHU NHUAN, AND THU DUC**

The report is revised and added according to the
conclusion of Ho Chi Minh City DONRE's Appraisal
Council dated December 14, 2007

HO CHI MINH CITY, 01.2008

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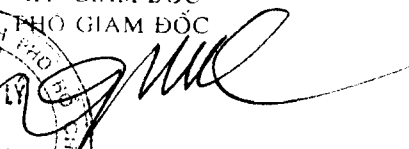
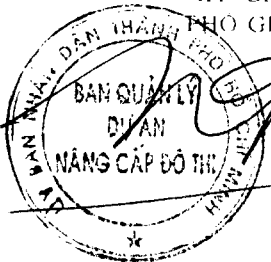
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**THE PMU OF HO CHI MINH CITY
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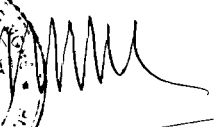
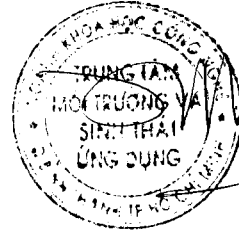
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HOÀNG VĂN TÙNG

HO CHI MINH CITY, 01.2008

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INTRODUCTION

1. ORIGIN OF THE PROJECT

Vietnam's population is increasing quickly, whereas investment in infrastructure facilities and services is not yet meeting people's demand, particularly in LIAs. LIAs in a state of no planning and lacking of basic infrastructure service have led to risk of environment and health of those people in particular and other impacts on the city in general.

In a bid to dealt with those difficulties and challenges, the Socialist Republic of Vietnam has contracted with the World Bank on a credit for implementation of the Vietnam Urban Upgrading Project (VUUP), which is a project incorporated in the hunger eradication, poverty alleviation and development strategy of Vietnam.

VUUP covers 4 cities including Ho Chi Minh City with the same component (6 components in general) for each city. One of the key components is Component 1 related to upgrading of tertiary infrastructure in the low income areas (LIAs) selected. In Ho Chi Minh City, Component 1 of the subproject is divided into two phases. The feasibility study, technical designing and preparation of chartering documents for phase 1 (upgrading tertiary infrastructure in 33 LIAs) have been accomplished. Phase 2 includes upgrading tertiary infrastructure (that means alleys, drainage, electrical network and public lighting, etc.) of 77 LIAs over 540 ha of 14 districts with 70,982 houses and 375,175 people as well as upgrading some grade-4 drainage systems which have been determined in the alleys that belong to the drainage region of Nhieu Loc – Thi Nghe:

- **Group 1:** Including LIAs of 05 districts: 4, 7, 8, Tan Phu, and Binh Tan.
- **Group 2:** Including LIAs of 06 districts: 9, 12, Go Vap, Binh Thanh, Phu Nhuan, and Thu Duc.
- **Group 3:** Including 4-degree alleys of 5 districts: 1, 10, Binh Thanh, Phu Nhuan, and Tan Binh.

VUUP is a multi-sector project to help LIAs to access urban conveniences such as convenient traffic, clean water and electricity at official prices, improved living conditions with drainage, restrooms and treated refuse, and low pollution for reducing health care expenses and increasing the number of workday of communities.

In addition, social facilities such kindergartens, schools, medical stations and markets will help communities for better care of their children, higher education, better prevention and treatment of diseases, and arrangement for trading activities in order to boost income. Besides, people in the site will have good minds for their living thanks to the protection of legal corridors for land use rights and housing rights.

In addition to social and economic benefits, the project will certainly causes some negative impacts on the environment if no proper protection measure is taken. In compliance with the Law on Environmental Protection, Group 2 (TV2-TP2, zones in Districts 9, 12, Go Vap, Binh Thanh, Phu Nhuan, Thu Duc has prepared the EIA report in the project to create the background for better environmental management in the construction and upgrading under

the project. That also provides scientific backgrounds for environmental management agencies in environmental management and monitoring.

The structure and contents of this EIA is prepared as regulated in Decree 80/2006/ND-CP dated 09/08/2006 by the government and Circular 08/2006/TT-BTNMT dated 08/09/2006 by the MORE on implementation of some contents in strategic environmental assessment, EIA and environmental protection undertaking. The report will be submitted to Ho Chi Minh City Service of Resources and Environment for examination and approval.

2. LEGAL AND TECHNICAL BACKGROUNDS OF EIA

▪ Legal background of EIA

The EIA report on the tertiary Infrastructure Upgrading Project - Component 1 – Phase 2 of TV2_TP2 is based on the legal backgrounds as follows:

- Vietnam Law on Environmental Protection 52/2005/QH11, passed by the National Assembly of the Socialist Republic of Vietnam on 29 November 2005.
- The Water Resources Law, passed by the National Assembly of the Socialist Republic of Vietnam on 20 May 1998, promulgated by the President on 01 June 1998;
- Decree 80/2006/ND-CP dated 09 August 2006 by the government on “Concrete regulations and guidance for implementation of some clauses of the Law on Environmental Protection”.
- Decree 81/2006/ND-CP dated 09 August 2006 by the government on “Administrative penalty in the field of environmental protection”.
- Decree 52/1999/ND-CP dated 08 July 1999 by the government on promulgation of the Statute on Investment and Construction Management;
- Decree 67/2003/ND-CP dated 13 June 2003 by the government on environmental protection fee applicable to effluent;
- Decree 59/2007/ND-CP dated 09 April 2007 by the government on solid waste management.
- Decree 68/CP dated 01 November 1996 by the government on implementation of the Minerals Law;
- Decree 04/2007/ND-CP dated 08/01/2007 by the government on amendment of some clauses of Decree 67/2003/ND-CP dated 13/06/2003 by the government on environmental protection fee applicable to effluent.
- Decree 68/2005/ND-CP dated 20 May 2005 by the government on chemicals safety.
- Decision 22/2006/QĐ-BTNMT dated 18 December 2005 by the Minister of Resources and Environment on obliged application of 05 Vietnamese environmental protection standards issued by the Minister of Science and Technology in Decision 1696/QĐ-BTNMT dated 28 July 2006.
- Decision 23/2006/QĐ-BTNMT dated 26 December 2006 by the Minister of Resources and Environment on issuance of the list of hazardous wastes.

- Vietnamese environmental standards issued under Decision 35/2002/QĐ-BKHCMNT dated 25/06/2002 by the MOSTE;
- Circular 08/2006/TT-BTNMT dated 08 September 2006 by the MORE on guidance for implementation of strategic EIA, EIA and environmental protection undertaking (on implementation of Decree 80/2006/ND-CP);
- Joint-Circular 125/2003/TTLT-BTC-BTNMT dated 18 December 2003, guiding for implementation of Decree 67 of the government on environmental protection fee applicable to effluent.
- Circular 12/2006/TT-BCN dated 12/12/2006 by the MOI with guidance for implementation of Decree 68/2005/ND-CP dated 20 May 2005 of the government on chemicals safety.
- Circular 12/2006/TT-BTNMT dated 26 December 2006 by the MORE with guidance related to conditions for practice and procedures for granting practice license and code of hazardous wastes management.
- Vietnamese standards issued in 1995, 2000, 2001 and 2005 by the Minister of Science, Technology and Environment;

▪ **Technical background of EIA**

The documents used as reference in this report include:

- Report on preliminary Community Upgrading Plans (CUPs) at LIAs of 06 districts, namely 9, 12, Go Vap, Binh Thanh, Phu Nhuan, and Thu Duc, prepared by Saigon Water Environment and Technical Infrastructure Company in 2006.
- Report on complete Step 1 (defining the demand for upgrading LIAs, community counsel and prepare preliminary CUPs for the LIAs in the selected regions) of 06 districts, namely 9, 12, Go Vap, Binh Thanh, Phu Nhuan, and Thu Duc, prepared by Saigon Water Environment and Technical Infrastructure Company in 2006.
- Technical documents of the World Health Organization and the World Bank on preparation of EIA (WHO, 1993).
- Documents related to determination of emission coefficients and waste treatment technologies of the World Health Organization and the World Bank (WHO, 1993).

3. IMPLEMENTATION

The EIA report on the *Sectoral Project No.2, component 1 - Phase 2, Group 2* (hereinafter referred to as TV2_TP2) in the *Ho Chi Minh City Urban Upgrading Project* (HUUP) is prepared by **The PMU of the HUUP** in cooperation with the CEECO.

Introduction of CEECO:

- Full name: Center for Environment and Ecological Application– CEECO
- Office: Building 26 Dinh Bo Linh, Ward 24, Binh Thanh district, Ho Chi Minh City.
- Tel.: 08 – 5117321 Fax: 08 – 5117320

Director: **Hoang Van Tung, BSc.**

The list of members partaking in the EIA is given below.

| No. | Full name | Academic standard | Speciality |
|-----|------------------------|-------------------|---------------------------|
| 1 | Hoang Van Tung | BSc | Ecological environment |
| 2 | Doan Canh | Ass. Prof. Ph.D. | Ecological environment |
| 3 | Nguyen Quoc Luan | MSc | Environmental technology |
| 4 | Nguyen Thuy Lan Chi | MSc | Environmental technology |
| 5 | Pham Van Mien | BSc | Ecological environment |
| 6 | Doan Thi Thuy | BSc | Ecological environment |
| 7 | Nguyen Nam Son | MSc | Environmental engineering |
| 8 | Ha Huy Minh | Engineer | Environmental engineering |
| 9 | Nguyen Nhat Vu | Engineer | Environmental engineering |
| 10 | Truong Tan Nhu Y | Engineer | Environmental engineering |
| 11 | Duong Tu Trinh | | Environmental science |
| 12 | Tran Cong Tan | BSc | Environmental science |
| 13 | Vo Phuong Hoai | BSc | Ecological environment |
| 14 | Nguyen Chi Thoi | BSc | Ecological environment |
| 15 | Nguyen Huynh Anh Tuyet | Engineer | Environmental management |
| 16 | Nguyen Thien Tu | Engineer | Environment |
| 17 | Hoang Van Tin | Engineer | Information technology |
| 18 | Ngo Dinh Tuan | Engineer | Environment |

| | | | |
|----|------------------|-----|------------------------|
| 19 | Nguyen Van Phung | BSc | Ecological environment |
|----|------------------|-----|------------------------|

In addition to those members, this EIA is constituted with the participation of many other experts with thorough knowledge in various fields such as control of air pollution, water pollution, effluent and solid waste, noise, vibration, hazardous wastes and environmental economics.

CHAPTER 1 DESCRIPTION OF THE PROJECT

1.1 GENERAL INTRODUCTION

1.1.1 Implementation of the project

The Socialist Republic of Vietnam has been granted by the World Bank the credit for implementation of the Vietnam Urban Upgrading Project (VUUP). The VUUP covers 4 cities including Ho Chi Minh City with the same component (6 components in general) for each city. The main component is Component 1 related to upgrading of tertiary infrastructure in the low income areas (LIAs) selected.

In Ho Chi Minh City, Component 1 of the subproject is divided into two phases. The feasibility study, technical designing and preparation of chartering documents for phase 1 (upgrading tertiary infrastructure in 33 LIAs) have been accomplished. Phase 2 includes upgrading tertiary infrastructure (that means alleys, drainage, electrical network and public lighting, etc.) of 77 LIAs over 540 ha of 14 districts with 70,982 houses and 375,175 people as well as upgrading some grade-4 drainage systems which have been determined in the alleys that belong to the drainage region of Nhieu Loc – Thi Nghe.

The regions to be upgraded in phase 2 can be divided into 3 groups as follows:

- **Group 1:** Including LIAs of 05 districts: 4, 7, 8, Tan Phu, and Binh Tan.
- **Group 2:** Including LIAs of 06 districts: 9, 12, Go Vap, Binh Thanh, Phu Nhuan, and Thu Duc.
- **Group 3:** Including 4-degree alleys of 5 districts: 1, 10, Binh Thanh, Phu Nhuan, and Tan Binh.

The three groups are corresponding to 3 chartering packages with 3 designing consultants as follows:

- **Group 1 (TV1_TP2): National Coporation of General Construction Consultants (NAGECO)**
- **Group 2 (TV2_TP2): Saigon Water, Environment and Infrastructure Company (Saigon Weico)**
- **Group 3 (TV3_TP2): Vietnam Water and Environment JS Company (Viwase)**

1.1.2 Objectives and principles of Ho Chi Minh City Subproject

The subproject has objectives as follows:

- Hunger eradication and poverty alleviation in urban areas
- Improvement of living and environmental conditions for low income communities and assistance for rearrangement of the city
- Soft loans for repairing houses and boosting income for the poor to be able to repay debts

- Assistance for municipal authorities' administration of houses and land for pushing forwards the grant of land use certificates (LUCs) to the poor

The subproject will be implemented on the principles as follows:

- Participation of communities
- Minimum site clearance and resettlement
- Participation of many sector administrations
- Changes in investment scale in accordance with shareholders' participation
- Application of lessons drawn from similar projects
- Design standards suitable with the community's ability and demand
- Special attention to master plans of the city and localities
- Investigation of primary and secondary infrastructure facilities in conjunction with tertiary infrastructure plans
- Clear determination of services to be contributed by communities
- Construction only with agreement from consultants and in compliance with procedures of Vietnam and the World Bank
- Upgrading infrastructure not only for meeting urgent and short-time demand of communities but also for creating favorable conditions for sustainable development in the future
- Improvement of public aware throughout the implementation of the project, particularly in terms of environmental protection

1.2 DESCRIPTION OF THE PROJECT COMPONENT 2 – GROUP 2

a) Title: Component 1 – Phase 2, Group 2: “Tertiary Infracstructure Upgrading for LIAs in Tan Hoa – Lo Gom Basin”, Ho Chi Minh City subproject – Vietnam Urban Upgrading Project .

b) Investment site: including 24 LIAs in districts 9, 12, Go Vap, Binh Thanh, Phu Nhuan, and Thu Duc.

c) Investor : The PMU for the HUUP
- Representative : Mr. Nguyen Hoang Nhan - Title: General Director
- Address : 5 Phung Khac Khoan, Dakao ward, District 1, Ho Chi Minh City
- Tel. : 08.8247663 - Fax: 08.8246499

d) Designing consultant : SAIGON WEICO of 179 Dinh Tien Hoang, District 1, Ho Chi Minh City.

e) Total investment capital : VND412,422,262,755

The investment capital has the structure as follows:

i) Ho Chi Minh City budget:

- 100% of compensation for damages of houses, works and architectures (yards, fences, trees, etc.) and land for the affected households which have to move out.
- 100% of compensation for partially affected houses, works and architecture (yards, fences, trees, etc.).

ii) Credit from the WB: up to 90% of the construction expenditure and 100% of community programs.

iii) **Local budgets (districts, wards):** 90% of expenditure for construction or upgrading some items in the zones of lower priority.

iv) **Mobilization from the community:**

- 10% of construction expenditure.
- 100% of the compensation for the partially affected land (for the households which do not have to move out).

v) **Capital of the entities administering the infrastructure works that have to be removed:** 100% of expense on removal of works for expanding alleys.

- Water supply: moving water supply
- Electricity companies: moving electrical network
- Others: moving cabling systems of telephone, television, Internet, etc.

1.3 THE PROJECT SITE

By means of summarization of the investigation in TV2, preliminarily it is determined 24 suitable LIAs in 6 districts for study and preparation of tertiary infrastructure upgrading plan. The zones to be upgraded in Group TV2_TP2 of the project are shown in **Table 1.1**.

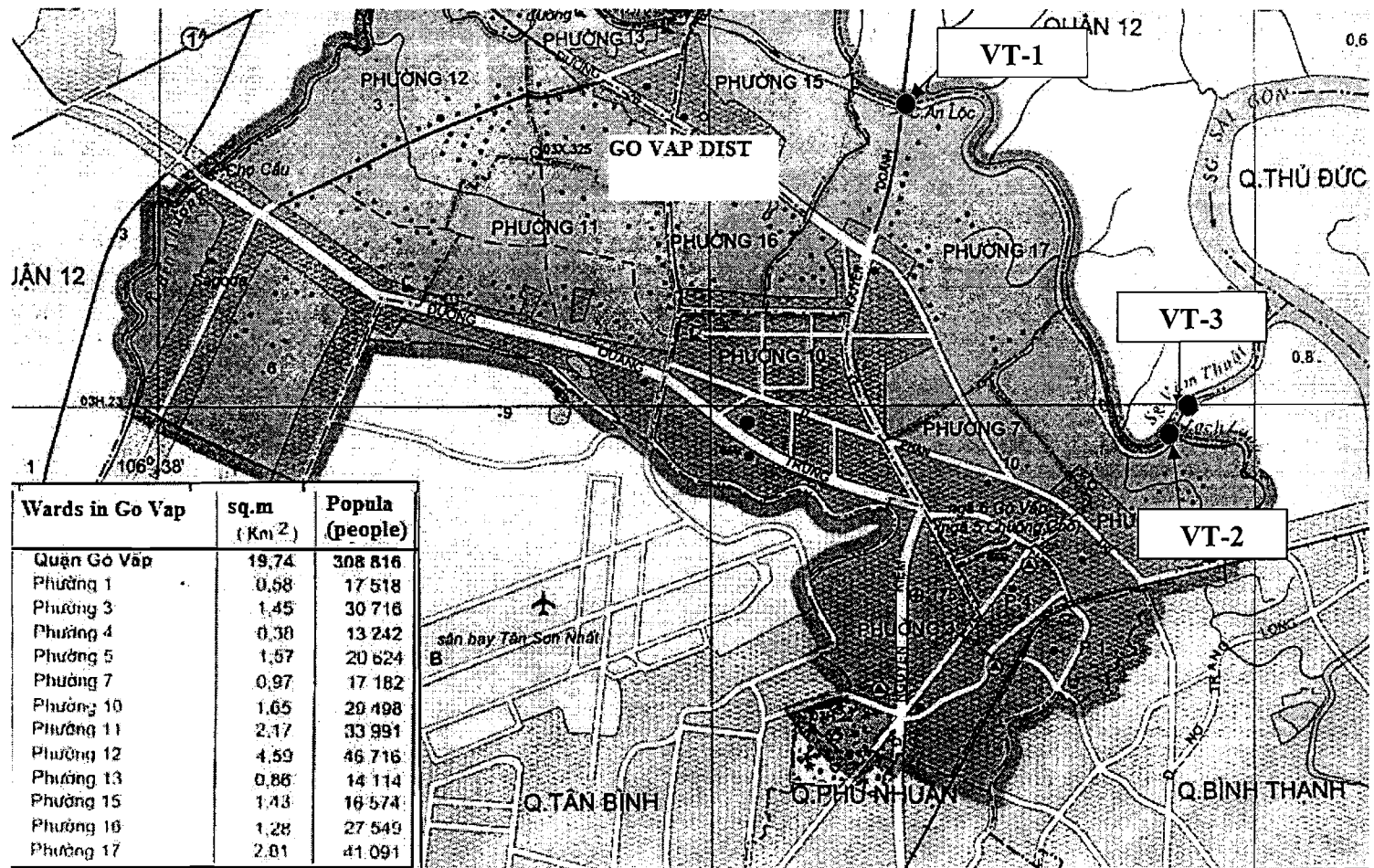
Table 1.1 – Zones to be upgraded in Group TV2_TP2 of the project

| District | LIA Code | Ward | Location | Area (m ²) |
|------------|----------|-----------------|--|------------------------|
| 9 | 09. 02 | Phuoc Long A | Xom Trung in Block 2 | 202,706 |
| 12 | 12. 01 | Tan Thoi Nhat | Block 1 | 189,500 |
| | 12. 02 | | Block 2 | 121,900 |
| | 12. 03 | Dong Hung Thuan | Block 1 | 44,000 |
| | 12. 04 | | Block 2 | 127,100 |
| | 12. 05 | | Block 3 | 187,400 |
| | 12. 06 | | Block 4 | 121,600 |
| | 12. 07 | | Block 5 | 100,300 |
| | 12. 08 | Tan Hung Thuan | Block 6 | 95,000 |
| | 12. 09 | Thanh Loc | Zone of Ga crossroads | 152,600 |
| | 12. 10 | | Block 3 – Group 13 | 90,000 |
| BINH THANH | BT. 02 | 2 | Alley 280/110 & 280/120 Bui Huu Nghia | 6,900 |
| | BT. 05 | 15 | Branches of alley 27 Dien Bien Phu of Blocks 1 & 2 | 34,900 |
| | BT. 07 | 2 | Alley 350 Bui Huu Nghia | 9,100 |
| GO VAP | GV. 02 | 5 | Blocks 7, 9 | 603,198 |
| | GV. 03 | 15 | Tu Dinh parish | 49,700 |
| | GV. 04 | 12 | Block 8 – on the left of Cho Cau bridge | 92,400 |
| PHU NHUAN | PN. 02 | 7 | Alley 65, 79 Phan Tay Ho | 34,900 |
| | PN.03 | 8 | Alley 270 Nguyen Trong Tuyen | 26,800 |
| | PN. 04 | 7 | Alley at the end of Cam Ba Thuoc | |
| | | | | 29,800 |

| District | LIA Code | Ward | Location | Area (m ²) |
|--------------------|----------|------------|----------------|------------------------|
| | | | road | |
| | PN.05 | | Nhieu Tu road | 16,900 |
| THU DUC | TĐ. 05 | Linh Chieu | Block 4 | 89,000 |
| | TĐ. 06 | Linh Tay | Blocks 3 and 5 | 78,700 |
| | TĐ. 07 | | Blocks 1 and 2 | 61,000 |
| Total | | | | 2,565,404 |

The positions of the zones to be upgraded are shown in **Figure 1.1**.

Figure 1.1. Location of sampling of surface water quality at Vam Thuat Channel



Remark:
● : Sampling location

1.4 CONTENTS OF THE PROJECT

1.4.1 Determination of the demand for upgrading tertiary infrastructure and community's ability of participation

The consultant worked with leaders of 06 relevant districts, and with the assistance of specializing officers of districts (divisions of investment management, resources and environment, and PMUs of districts, etc.), community counsel at representative level was done at 14 wards having slums (determined in the zoning investigation by Saigon Weico in combination with leaders of relevant wards) and incorporated in the upgrading project for defining the demand and participation ability of communities as well as suitable standards related to the connections of primary and secondary infrastructure facilities those will apply to specific zones.

Attending the work sessions included representatives for communist party leaders, PCs of wards, social organizations such as the Fatherland Front, Youth Union, Women Union, Veterans Association, etc. and representative for management units of residential blocks and groups of 24 slums.

It was recorded in the sessions at 14 wards of 06 districts as follows:

In the VUUP – HUUP, the TV2_TP2 defined 39 LIAs. However, summarization of the investigation up to date found 24 LIAs of 6 districts, namely Phu Nhuan, Binh Thanh, Thu Duc, Go Vap, 9, and 12 that are suitable for study and preparation of tertiary infrastructure facility upgrading plan.

Representatives for all related wards and slums included in the project showed their wish for the project to be implemented soon and readiness for contribution (financial share and monitoring of construction, operation, maintenance, overhaul, etc.)

Results of community counsel has been reported by the consultant to the PMU and the PCs of the districts that have slums where the project will be implemented.

1.4.2 Technical standards

a) Introduction:

- One of the basic principles of the subproject is upgrading based on “Suitable Technical Standards” that meet the demand and capability of the relevant community. Infrastructure facilities will be designed within suitable cost, meaning that it is the maximum cost affordable for every family or each hectare of the zone to be upgraded.
- The current Vietnamese construction standard is too high for this kind of project. Therefore, it is necessary to compare the Vietnamese construction standards, regulations of the city and other sectors and localities and with reference to standards applicable to the nation having similar project (as recommended by the World Bank as sponsor) and the actual and short-term demand of people in communities and thereupon recommend Suitable Technical Standards, which harmonize those standards with the actuality of the zones to be upgraded. Particularly, evaluation of strong and

weak points of activities performed in phase 1 (TP1) – VUUP has been made to reach feasible and suitable standards.

b) Recommended standards

i) Network of alleys

All main alleys (for ambulance, fire truck, etc.) should be at least 4.5m wide. Sub-alleys (for two wheeler and pedestrian) should be at least 2m wide.

Main alley $\geq 6m$

- Minimum radius of vertical curve: 0.00m.
- Minimum radius of horizontal curve: 5,00m.
- Transversal slope: 2%.
- Road basement width: $\geq 6m$
- Road face width: $\geq 6m$
- Maximum lengthwise slope : 5%
- Sidewalk width: 0m.
- Tonnage: 9,5T.
- Minimum speed of vehicles: (5km/h on curves)
- Load applicable to sullage pit: H18.

Main alley $4.5 \div 6m$

- Minimum radius of vertical curve 0.00m.
- Minimum radius of vertical curve 5,00m.
- Transversal slope: 2%.
- Road basement width: $4,5 \div 6m$
- Road face width: $4,5 \div 6m$
- Maximum lengthwise slope: 5%
- Sidewalk width: 0m.
- Tonnage: 9,5T.
- Minimum speed of vehicles: (5km/h on curves)
- Load applicable to sullage pit: H18.

Sub-alley $\geq 2m$

- No curve radius.
- No 2D visuality
- Transversal slope: 2%
- Road basement width: $\geq 2,0m$
- Road face width: $\geq 2,0m$

- Maximum lengthwise slope: 5%
- Tonnage: simple vehicles (3-wheel and motorized vehicles)
- Speed: 10 – 15 km/h.

ii) Public lighting

- Public lighting lamps and electricity poles for all alleys with vehicles or pedestrian, at most 50 m/pole. Transformer capacity: 2 KVA/household.
- Poles together with electrical network: new ones will be built in the alleys that have not pole yet
- Lamp-hanging height:: 5.50 m
- Cable: Hanging cable Quaduplex 4x11mm² supported by electricity poles.
- Lamp: high-pressure sodium lamp 75W/220V, yellow light.

iii) Drainage

Comments:

- Discharge of rainwater and wastewater in the same drainage.
- Alternatives including:
 - * Drainage via underground reinforced concrete culvert
 - * Drainage via open ditch with reinforced concrete covers
- Drainage via open ditch is easy for maintenance but covering large areas and causing environmental pollution.
- The Vietnamese construction standard regulates that primary and secondary urban areas should use closed drainage for rain water, i.e. culvert.

Recommended standards:

- Drainage of reinforced concrete culverts;
- Reinforced concrete culverts of Ø600 for main alleys;
- Reinforced concrete culverts of Ø400 for sub-alleys;
- Soakage pits are located 25 m from each other on main and secondary drainages to receive rain water from road faces and culverts should be dredged periodically.

iv) Water supply

Comments

- Installation of water supply pipelines is recommended for the requiring LIAs (i.e. having no or insufficient water supply, or using tube well water);
- Norm of water supply for urban living according to the Vietnamese Construction Standard: 180 L per capita per day.

Recommended standards

- Along main alleys: PVC pipes of Ø150mm on average.
- Along sub-alleys: PVC pipes of Ø100mm on average.
- Ø15mm water meters of for any household that has not separate water.

- Norm of water supply: 180 L per capita per day.

v) Fire prevention:

Comments

According to the Vietnamese Construction Standard:

- At primary and secondary urban centers and densely populated areas, the maximum interval between fire hydrants is 100 m.
- Diameter of fire hydrants: ≥ 100 mm.

Recommended standards

- Interval between fire hydrants: 150m.
- Diameter of fire hydrants: 100mm.
- Reservoirs (50m^3 each) should be arranged at the zone where water pressure is not sufficient.

1.4.3 Designing items – Component 1: Tertiary infrastructure facilities – TV2_TP2

a) Designing solutions

i) System of alleys

- *Main alley (width $\geq 4,50\text{m}$):*
 - The removal for expansion will be done by local people.
 - The prolongation of main alleys to roads is considered connection with a primary/secondary traffic system outside the slum. If the reserve for connection of this tertiary infrastructure is not sufficient, it will be added in the connection of further connections of primary and secondary infrastructure facilities. If the reserve is abundant, it will be used for car parks and roundabouts. If the existing alley is wider than 4.5m, the current width will be remained because the unit price for estimation is in square meter.
- *Sub-alley (width $\geq 2\text{m}$):*
 - The removal because the existing alley is narrower than 2m will be done by local people.
 - If the existing alley is wider than 2 m, the current width will be remained because the unit price for estimation is in square meter.
- *Blind alley (width $< 2\text{m}$, length $< 25\text{m}$):*
 - Expanding to 2m width or keeping intact blind alleys, which are also called passageways as they are at most 25m and used only for 1 to 2 households, will be determined by local authorities but the quantity of works is included in the total length and area of sub-alleys.

ii) Landfill

- Landfill will be done for elevating basements of alleys in low land.

- The level for landfill will be based on actual requirements based on investigation of inundation level, and current altitudes primary and secondary infrastructure facilities of the city or according reports of local authorities.

iii) water supply

- PVC $\phi 150$ pipelines: along main alleys to roads. Connections to primary and secondary infrastructure facilities or water supply stations to be established for zones will be calculated later.
- PVC $\phi 100$ pipelines: along sub-alleys.
- Accessories such joints are included in the unit price for water supply pipelines.
- The numbers of water meters and small water pipes ($\phi 100$) are calculated based on the number of households which have no separate water meters in the zones to be upgraded.

iv) Drainage

- Drainage $\phi 600$:
- Along main alleys as mentioned above. Connections to primary and secondary infrastructure facilities will be separately calculated or measures of natural absorbance will be taken. This will be reported in more details in the feasibility study based on the altitude of the whole area that covers primary and secondary infrastructure facilities; it will be calculated to connect with the existing tertiary infrastructure facilities.
- Sullage pits of $\phi 400$: along sub-alleys.
- Soakage pits are located with the average interval of 25m.
- The calculated length of the drainage is equal to the length of alleys, even though some alleys have had old sewers. In the feasibility study, this will be recalculated if the old sewers are still good and compatible with the new drainage.
- In the feasibility study report, if required, sewers running across alleys will be calculated.

v) Electrical network

- The network includes low-voltage lines, public lighting, transformers and power meters.
- Low-voltage lines and public lighting:
- The quantities of low-voltage lines and public lighting have been calculated from the total length of main alleys and sub-alleys.
- Transformers:
- This is calculated from the norm of 02KVA/household since LIAs will use electricity for living and lighting, not production.
- Power meters:
- Those will be installed separately for houses with the number calculated from the ratio of houses that have, as investigated, no power meter.

vi) Public lighting

- Public lighting lamps will be arranged along alleys in LIAs.
- Lamp-posts: using electricity poles.
- Wiring: Using hanging cable Quaduplex 4x11mm² on electricity poles.
- Lamps: High-pressure sodium 75W/220V, yellow light.

vii) Environmental treatment

viii) Fire system

- Fire hydrants will be installed along main alleys, on junctures or ends of main alleys, with the interval of 150m.
- Positions are selected at junctures and ends of main alleys such that fire trucks are easy to access to take water and operate.

b) Quantity of tertiary infrastructure facilities to be upgraded

The workloads of the projects include preliminary upgrading of items such as water supply, drainage, alleys, public lighting at the zones mentioned above. The detailed quantities of works are shown in Table 1.2.

All work items in the project will be designed and built up following standards as follows:

- *Alleys*
 - Procedure applicable to investigation of roads for automobile 22 TCN 263-2000.
 - Procedure applicable to design of soft road cover according to standard 22TCN-211-93.
 - Procedure applicable to design of hard road cover 22TCN 223-95.
 - Standard on design of roads for automobile TCVN 4054-05.
 - Procedure applicable to design of bridges and culverts 22TCN 18-79.
 - Urban planning TCVN 4449-87
 - Planning for design of streets and urban square roads 20TCN 104-83
 - Standards on internal and external drainage networks 20TCN 51-84.
 - Procedure applicable to investigation and design of road basement on weak land: 22TCN 262-2000
- *Work items of the drainage*

Technical design standard: applying Vietnamese design standard 20TCN 51-84 issued on 22 September 1984.
- *Work items of the water supply*

Based on “Standard for design of water supply – external and internal networks” TCVN 33-2006 Construction standard issued by the Ministry of Construction in 2006.
- *Work items of the public lighting*

Applying the Vietnamese standards on public lighting:

- TCVN 259 - 2001.
- TCVN 5661 – 1992.
- TCVN 1835 - 1994.

Table 1.2 - Quantity of work items of tertiary infrastructure to be upgraded in TV2_TP2

| DISTRICT | UPGRADED AREA | UPGRADED ITEM | | | | | | | | | | | | | | | | | | |
|-------------|---------------|---------------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------------|----------------------------|------------------------------|--|----------------------------------|------------------------------|--------------|---------------------|------------------------|
| | | WATER SUPPLY | | | DRAINAGE | | | | | | TRANSPORT | | LIGHT & ELECTRICITY MOVING | | | | | FIRE-HYDRANT | WATER-CLOCK | |
| | | D50 (m) | D100 (m) | D150 (m) | D400 (m) | D600 (m) | D800 (m) | D1000 (m) | D1200 (m) | D1500 (m) | D2000 (m) | MAIN ALLEY (m2) | SUB-ALLEY (m2) | NEWLY INSTALLING LIGHT (SET) | NEWLY INSTALLING ELECTRICITY CABLE (m) | INSTALLING CONTROL STATION (cát) | ELECTRICITY CABLE MOVING (m) | | GALVANO METER (PCS) | NEWLY INSTALLING (PCS) |
| DISTRICT 12 | 12.01 | | 2,997 | 911 | 1,529 | 1,152 | 252 | 148 | | | | 8,712 | 12,037 | 149 | 4,475 | 6 | 3,373 | 198 | 4 | 874 |
| | 12.02 | | 1,470 | 1,500 | 664 | 219 | - | - | | | | 2,112 | 4,263 | 37 | 2,248 | 4 | 1,800 | 52 | 5 | 361 |
| | 12.03 | | 501 | 242 | 374 | 171 | - | - | | | | | 2,113 | 37 | 1,155 | 2 | 757 | 12 | 1 | 126 |
| | 12.04 | | 1,638 | 858 | 1,321 | 656 | 167 | 298 | | | | 7,422 | 4,265 | 95 | 3,484 | 4 | 2,699 | 219 | 6 | 558 |
| | 12.05 | | 3,427 | 1,161 | 2,484 | 516 | 306 | 231 | | | | 5,666 | 12,500 | 99 | 3,614 | 4 | 2,799 | 321 | 7 | 1,107 |
| | 12.06 | | 2,510 | 413 | 1,512 | 481 | - | - | | | | 3,944 | 4,932 | 107 | 3,526 | 4 | 2,694 | 63 | - | 523 |
| | 12.07 | | 1,765 | 181 | 737 | 710 | 298 | 87 | | | | 3,801 | 5,059 | 40 | 1,676 | 2 | 1,236 | 68 | 3 | 431 |
| | 12.08 | | 1,638 | 1,099 | 878 | 690 | - | - | | | | 2,706 | 3,819 | 81 | 2,602 | 3 | 1,981 | 98 | - | 396 |
| | 12.09 | | 1,413 | 692 | 724 | 299 | 208 | - | | | | 3,467 | 3,120 | 34 | 1,418 | 2 | 970 | 139 | 6 | 326 |
| GO VAP | GV.02 | 334 | 4,018 | 4,072 | 3,166 | 3,112 | 1,154 | 612 | 88 | 203 | 336 | 29,849 | 13,657 | 58 | 1,441 | 4 | 12,360 | 554 | 41 | 784 |
| | GV.03 | | 754 | 430 | 569 | 283 | 66 | 89 | | | | 1,332 | 2,297 | 56 | 1,863 | 4 | 1,339 | 110 | | 265 |
| | GV.04 | | 1,864 | 380 | 451 | 132 | | | | | | | 2,483 | 511 | 14,904 | 4 | 1,009 | 66 | | 240 |
| PHU NHUAN | PN.01 | | | | 600 | | | | | | | | 1,197 | | | | | 101 | | 101 |
| | PN.02 | | | | 799 | 204 | | | | | | 1,565 | 1,780 | 79 | 2,058 | 4 | 1,442 | 230 | | 230 |
| | PN.03 | | | | | | | | | | | 1,041 | 1,086 | 45 | 1,354 | 2 | 824 | 110 | | 110 |
| | PN.04 | | | | 180 | 102 | 130 | | | | | 1,951 | | 23 | 519 | 2 | 227 | 61 | | 61 |
| | PN.05 | | | | 449 | - | 210 | 46 | 103 | | | 1,770 | 1,438 | 73 | 1,551 | 4 | 1,009 | 93 | | 93 |
| BINH THANH | BT.02 | | | | 209 | | | | | | | | 508 | 16 | 773 | 2 | 309 | 40 | | 40 |
| | BT.05 | | | | 400 | | | | | | | | 1,521 | 57 | 1,708 | 4 | 1,030 | 49 | | 49 |
| | BT.07 | | | | 201 | 28 | | | | | | | 600 | 16 | 769 | 2 | 355 | 24 | | 24 |

| DISTRICT | UPGRADED AREA | UPGRADED ITEM | | | | | | | | | | | | | | | | | | | |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|------------|------------|------------|-----------------|----------------------------|------------------------------|--|----------------------------------|------------------------------|---------------------|--------------|------------------------|--------------|
| | | WATER SUPPLY | | | DRAINAGE | | | | | | TRANSPORT | | LIGHT & ELECTRICITY MOVING | | | | | | FIRE-HYDRANT | WATER-CLOCK | |
| | | D50 (m) | D100 (m) | D150 (m) | D400 (m) | D600 (m) | D800 (m) | D1000 (m) | D1200 (m) | D1500 (m) | D2000 (m) | MAIN ALLEY (m2) | SUB-ALLEY (m2) | NEWLY INSTALLING LIGHT (SET) | NEWLY INSTALLING ELECTRICITY CABLE (m) | INSTALLING CONTROL STATION (cái) | ELECTRICITY CABLE MOVING (m) | GALVANO METER (PCS) | | NEWLY INSTALLING (PCS) | MOVING (PCS) |
| THU DUC | TĐ.05 | | | | 813 | 359 | 97 | | | | | 1,616 | 3,292 | 34 | 1,110 | 2 | 824 | 177 | 4 | | 177 |
| | TĐ.06 | | | | 304 | 212 | | | | | | | 1,235 | 37 | 1,069 | 3 | 721 | 26 | 3 | | 26 |
| | TĐ.07 | | 130 | | 680 | 320 | 100 | | | | | 2,320 | 1,768 | 28 | 777 | 2 | 515 | 159 | 2 | 50 | 159 |
| 9 | 09.02 | | 200 | | 2,170 | 650 | 800 | 70 | | | | 6,801 | 5,496 | 68 | 1,864 | 4 | 1,442 | 482 | 9 | 50 | 482 |
| TOTAL | | 334 | 24,325 | 11,939 | 21,214 | 10,296 | 3,788 | 1,581 | 191 | 203 | 336 | 86,075 | 90,466 | 1,780 | 55,958 | 74 | 41,715 | 3,452 | 91 | 6,091 | 1,552 |

1.4.4 Construction procedure

The project has 3 items to be upgraded, those include water supply, drainage and alleys together with public lighting. The procedure of construction of those items will include many steps which can be outlined by the flow charts given in Figures 1.2, 1.3, 1.4.

Figure 1.2 – Procedure applicable to construction of drainage

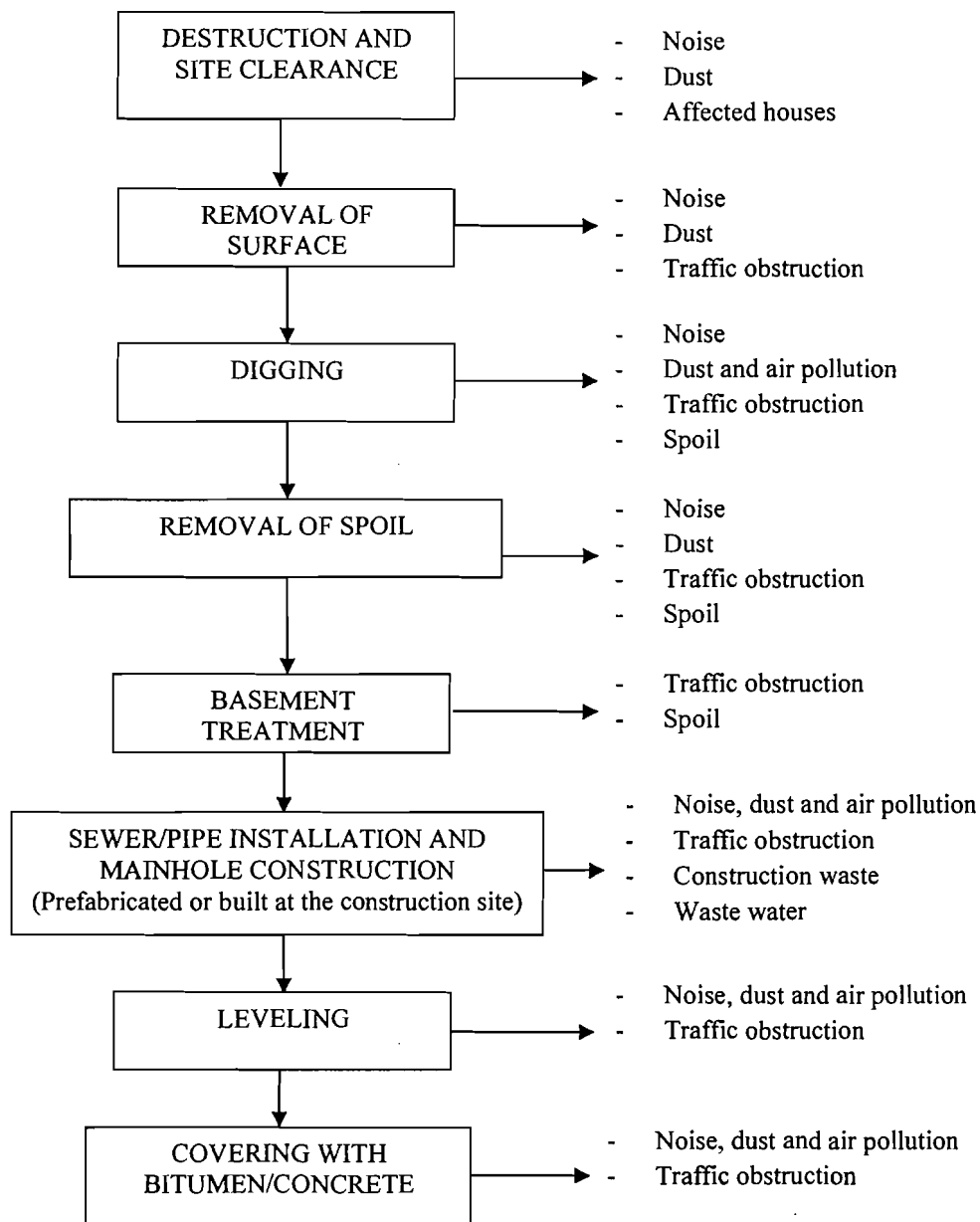


Figure 1.3 – Procedure applicable to construction of water supply systems

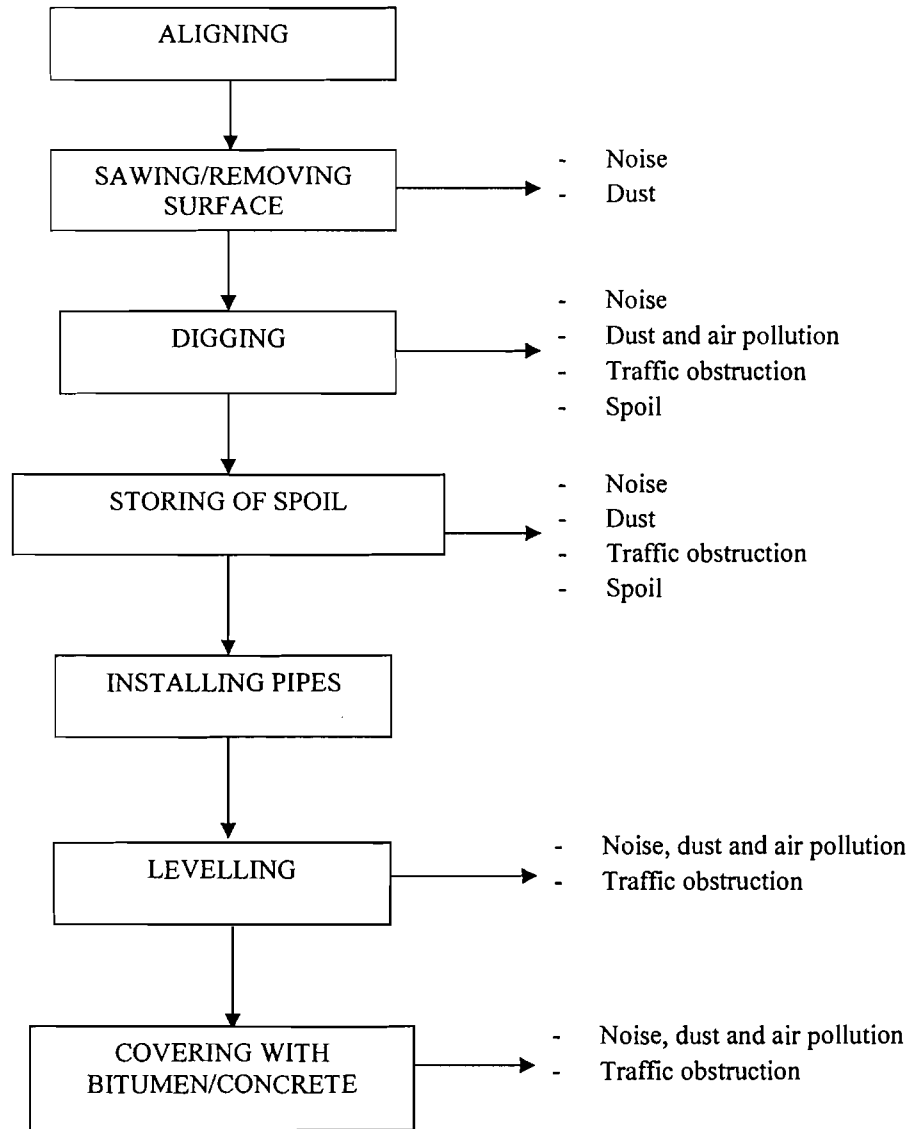


Figure 1.4 – Procedure applicable to upgrading of alleys

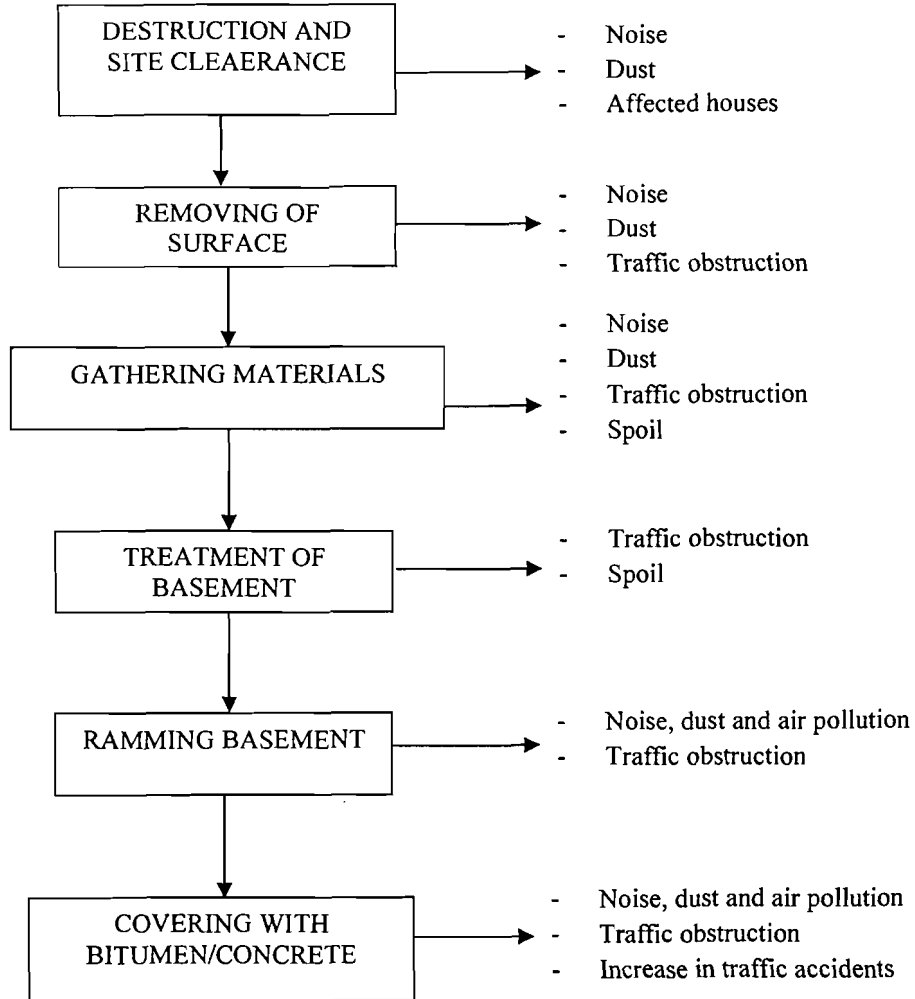
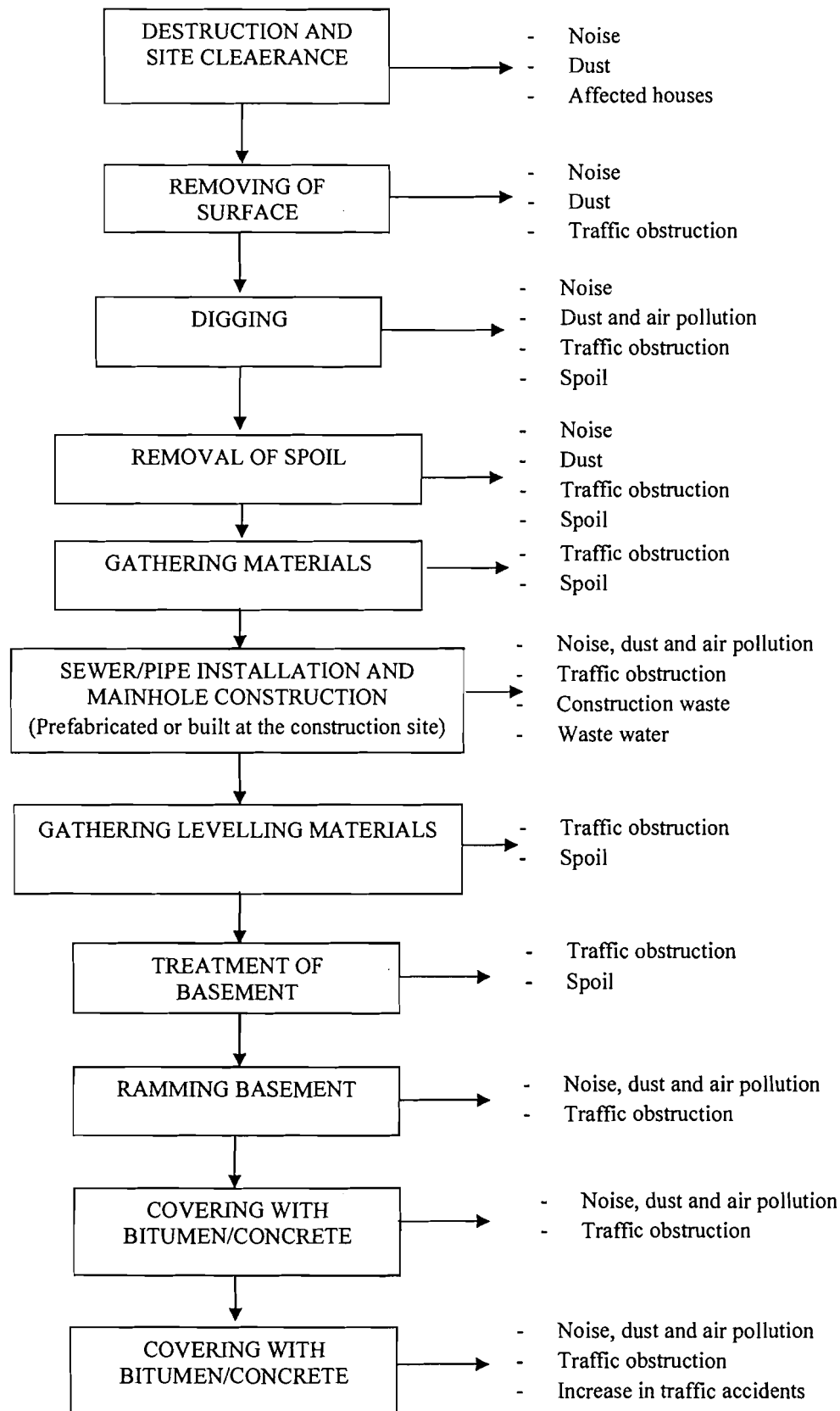


Figure 1.5 – Procedure applicable to construction 3 main items simultaneously



1.4.5 Implementation schedule

The project is estimated within 4 years. Details of implementation schedule as follow:

| Contents | Period |
|---|-----------------|
| I. Investment Preparation: | |
| Choosing consultant to set up Component 1 – Phase 2 | 01/2006-07/2006 |
| Setting up the basic design and submitting to Department of transport and public works for approval | 05/2006-01/2008 |
| Setting up the investment project report / Planning and investment Department approves/ HCMC People’s committee makes investment decision | 03/2007-03/2008 |
| Detail design, preparing documents for inviting tender for construction. | 02/2008-04/2008 |
| WB approves | 02/2008-04/2008 |
| Clearance Compensating to prepare for construction | 03/2008-12/2008 |
| Completing the plan and calling for tender | 04/2008-07/2008 |
| II. Performance: | |
| Performance group for TV2 | 08/2008-03/2010 |
| Striking the balance | 12/2009-12/2010 |

1.4.6 Total investment

The total investment in upgrading of work items of specific zones and other expenses are summarized in Table 1.3 below.

Table 1.3 – Total expenditure of Component 1 – Phase 2 – Bidding package TV2_TP2

| NO. | Item | Unit | Quantity | Unit price (VND) | Value | |
|------------|-------------------------------|----------------|------------|------------------|------------------------|-------------------|
| | | | | | VND | USD |
| I | CONSTRUCITON COST | | | | 250,024,691,942 | 15,481,405 |
| 1.1 | Alley | | | | 122,463,986,102 | 7,582,909 |
| | – Bitumen concrete main alley | m ² | 8,136.20 | 284,000 | 2,310,680,800 | 143,076 |
| | – Concrete main alley | m ² | 78,531.50 | 355,000 | 27,878,682,500 | 1,726,234 |
| | – Concrete sub-alley | m ² | 100,771.46 | 212,000 | 21,363,548,884 | 1,322,820 |
| | – Basement digging | m ³ | 25,437.75 | 191,000 | 4,858,610,775 | 300,843 |
| | – Basement building | m ³ | 16,789.50 | 302,000 | 5,070,428,948 | 313,958 |
| | – Basement reinforcing | m ³ | 58,464.74 | 368,000 | 21,515,025,792 | 1,332,200 |
| | – Wall building | m ³ | 22,260.02 | 1,773,000 | 39,467,008,403 | 2,443,778 |
| 1.2 | Drainage | | | 0 | 85,358,931,080 | 5,285,383 |
| | – Ø 300 | m | 7,841.00 | 795,000 | 6,233,595,000 | 385,981 |
| | – Ø 400 | m | 29,007.00 | 1,139,000 | 33,038,973,000 | 2,045,757 |
| | – Ø 600 | m | 5,004.00 | 1,791,000 | 8,962,164,000 | 554,933 |
| | – Ø 800 | m | 1,372.00 | 2,750,000 | 3,773,000,000 | 233,622 |
| | – Ø 1000 | m | 249.00 | 3,398,000 | 846,102,000 | 52,390 |
| | – Ditch 300x400 | m | 307.00 | 532,000 | 163,324,000 | 10,113 |

| NO. | Item | Unit | Quantity | Unit price (VND) | Value | |
|------------|---|----------------------|------------------|------------------|-----------------------|------------------|
| | | | | | VND | USD |
| | – Ditch 400x400 | m | 559.00 | 576,000 | 321,984,000 | 19,937 |
| | – Soakage pit Ø 400 | No. | 2,125.00 | 6,460,000 | 13,727,500,000 | 850,000 |
| | – Soakage pit Ø 600 | No. | 311.00 | 7,603,000 | 2,364,533,000 | 146,411 |
| | – Soakage pit Ø 800 | No. | 65.00 | 8,889,000 | 577,785,000 | 35,776 |
| | – Soakage pit Ø 1000 | No. | 11.00 | 12,449,000 | 136,939,000 | 8,479 |
| | – Soakage pit, sub-alley >6m | No. | 11.00 | 6,460,000 | 71,060,000 | 4,400 |
| | – Soakage pit, sub-alley >4,5m<6m | No. | 1,471.00 | 1,804,000 | 2,653,684,000 | 164,315 |
| | – Soakage pit ditch 300x400 | No. | 28.00 | 2,204,000 | 61,712,000 | 3,821 |
| | – Soakage pit ditch 400x400 | No. | 40.00 | 2,584,000 | 103,360,000 | 6,400 |
| | – Manhole 400 | No. | 10.00 | 19,169,000 | 191,690,000 | 11,869 |
| | – Manhole 600 | No. | 8.00 | 24,133,000 | 193,064,000 | 11,954 |
| | – Manhole 800 | No. | 9.00 | 25,626,000 | 230,634,000 | 14,281 |
| | – Manhole 1000 | No. | 3.00 | 27,632,000 | 82,896,000 | 5,133 |
| | – Driving of cajuput stakes | m | 1,937,488.68 | 6,000 | 11,624,932,080 | 719,810 |
| 1.3 | Water supply | | | 0 | 24,722,239,000 | 1,530,789 |
| | – Ø 50 | m | 123.00 | 166,000 | 20,418,000 | 1,264 |
| | – Ø 100 | m | 22,724.00 | 258,000 | 5,862,792,000 | 363,021 |
| | – Ø 150 | m | 12,797.00 | 378,000 | 4,837,266,000 | 299,521 |
| | – Ø 200 | m | 654.00 | 632,000 | 413,328,000 | 25,593 |
| | – Connecting (meter excluded) | house | 7,495.00 | 1,813,000 | 13,588,435,000 | 841,389 |
| 1.4 | Fire hydrant | Set | 142.00 | 17,697,000 | 2,512,974,000 | 155,602 |
| 1.5 | Public lighting | | | 0 | 14,966,561,760 | 926,722 |
| | – Electricity pole | pole | 806.00 | 2,200,000 | 1,773,200,000 | 109,796 |
| | – Bracket and lamp | set | 1,351.00 | 5,159,000 | 6,969,809,000 | 431,567 |
| | – Wire | m | 29,840.80 | 96,000 | 2,864,716,800 | 177,382 |
| | – Control panel | set | 49.00 | 17,641,000 | 864,409,000 | 53,524 |
| | – Accessories | | | 0 | 2,494,426,960 | 154,454 |
| II | COMPENSATION | | | | 66,807,623,368 | 4,136,695 |
| 2.1 | Land | m² | 21,992.72 | | 36,899,320,672 | 2,284,788 |
| | – contributed by people | m ² | 21,556.25 | | 23,574,904,672 | 1,459,746 |
| | – compensated by the state | m ² | 436.47 | | 13,324,416,000 | 825,041 |
| 2.2 | House and yard | m² | 23,231.77 | | 12,436,998,842 | 770,093 |
| | – Class-2 house | m ² | 2,680.24 | 1,870,000 | 5,012,057,222 | 310,344 |
| | – Class-3 house | m ² | 3,833.90 | 1,540,000 | 5,904,209,293 | 365,586 |
| | – Class-4 house | m ² | 512.74 | 880,000 | 451,209,719 | 27,939 |
| | – Yard | m ² | 16,204.89 | 66,000 | 1,069,522,608 | 66,224 |
| 2.3 | Moving power and water meters | | | | 2,054,160,000 | 127,193 |
| | – Moving water meters | Nos. | 1,239.00 | 720,000 | 892,080,000 | 55,237 |
| | – Moving power meters | Nos. | 1,076.00 | 1,080,000 | 1,162,080,000 | 71,955 |
| 2.4 | Other allowances | | | | 15,417,143,854 | 954,622 |
| III | MOVING INFRASTRUCTURE FACILITIES | | | | 29,411,213,087 | 1,821,128 |
| | – Water pipes of various kinds. | M | 10,840.00 | 129,000 | 1,398,360,000 | 86,586 |
| | – Medium-voltage network | m | 5,386.87 | 610,000 | 3,285,988,667 | 203,467 |
| | – Low-voltage network | m | 42,369.70 | 381,000 | 16,142,855,700 | 999,558 |

| NO. | Item | Unit | Quantity | Unit price (VND) | Value | |
|----------------------|---|-----------|---------------|---------------------|------------------------|-------------------|
| | | | | | VND | USD |
| | – Transformers | Station | 7.00 | 15,000,000 | 105,000,000 | 6.502 |
| | – Telecom, television works | m | 44,862.48 | 189,000 | 8,479,008,720 | 525.016 |
| IV | COMMUNITY PROGRAM | ha | 256.54 | 2,500,000 | 641,351,000 | 39.712 |
| V | OTHER BASIC CONSTRUCTION COST | | | | 11,826,829,652 | 732.311 |
| 5.1 | Project management (1.152%*Gxdtt) | | | | 2,880,284,451 | 178,346 |
| 5.2 | Examination of technical designs and technical drawings (0.152%*Gxdtt) | | | | 380,037,532 | 23,532 |
| 5.3 | Examination of estimate and total expenditure (0.147%*Gxdtt) | | | | 367,536,297 | 22,758 |
| 5.4 | Monitoring of construction (1.964%*Gxdtt) | | | | 4,910,484,950 | 304.055 |
| 5.5 | Insurance (0.35%*Gxdtt) | | | | 875,086,422 | 54.185 |
| 5.6 | Preparation of feasibility study report, basic design and construction technique, bidding documents and analysis of bidding documents – Bidding package TV2-TP2 | | | | 2,413,400,000 | 149.437 |
| A | SUBTOTAL (I + II + III + IV + V) | | | | 358,711,709,048 | 2.211.251 |
| B | TOTAL CONTINGENCY = 15% x (I + II + III + V) | | | | 53,710,553,707 | 3.325.731 |
| TOTAL (A + B) | | | | | 412.422.262.755 | 25,536,982 |

CHAPTER 2

NATURAL, ENVIRONMENTAL AND SOCIO-ECONOMIC CONDITIONS OF THE PROJECT SITE

2.1 NATURAL CONDITIONS

2.1.1 Geographic, topographic and geological conditions

a) Geographic, topographic conditions

The study site of the project group 2 – TV2 (except for Tan Hoa Lo Gom basin) includes 24 LIAs over 208ha of 6 districts, namely 9, 12, Phu Nhuan, Binh Thanh, Thu Duc and Go Vap.

i) Geographic conditions

- **Binh Thanh district:** The district is located in the northeast of Ho Chi Minh City, playing the role of a gate and a strategic area of the city. It border District 2 and Thu Duc district in the northeast, Binh Thanh and District 1 in the south over Thi Nghe arroyo, and Go Vap district and Phu Nhuan district in the west – northwest. Binh Thanh District is surrounded by the Saigon River in the northeast. Together with the Saigon River, canals and arroyos such as Thi Nghe, Cau Bong, Van Thanh, Thanh Da, Ho Tau and Thu Tac, etc. create a system of waterways that facilitate small boats to go to further inland zones of the district as well as to other areas.
- **Go Vap district:** The district is located on the northern belt of Ho Chi Minh City. About 1 km from the center of Ben Nghe (now District 1) in the northwest, it is a hillock land (11 m over the sea level) supplied with fresh water from the Ben Cat River, a tributary of the Saigon River, and therefore favorable for cultivation and living. In the past, migrants selected this land to set up villages, forming their new motherland.
- **Phu Nhuan district:** over 4,9km², Phu Nhuan District is located in the southwest of Ho Chi Minh City center. It borders Tan Binh district in the north, District 1 in the South, Binh Thanh district and Go Vap in the east, and District 3 in the west.
- **Thu Duc district:** This is a suburban district in the northeast of Ho Chi Minh City. In 1997, the old Thu Duc district was divided into 3 new districts, namely District 2, District 9 and the current Thu Duc district under Decree 03/CP dated 06 January 1997 by the government. The new Thu Duc district covers 47.76 km², including the areas and populations of communes of Linh Dong, Linh Trung, Tam Binh, Tam Phu, Hiep Binh Phuoc, Hiep Binh Chanh, Thu Duc town, a part of communes of Hiep Phu, Tan Phu and Phuoc Long. After said division, communes were renamed wards. Thu Duc district has 12 wards with the same names as previous communes, i.e. Linh Dong, Linh Tay, Linh Chieu, Linh Trung, Linh Xuan, Hiep Binh Chanh, Hiep Binh Phuoc, Tam Phu, Truong Tho, Binh Chieu, Binh Tho, and Tam Binh. Its population is estimated at 250,000 people.

- **District 9:** The district had the area of 11,362 ha and the population of 126,220 people when it was established. District 9 is located in the east of Ho Chi Minh City, about 7 km from the city center via Hanoi highway. It borders Nhon Trach district – Dong Nai province over the Dong Nai River in the east, Thu Duc district in the west, District 2 and the Dong Nai River in the south, and Bien Hoa City – Dong Nai province in the north.

District 12: The district is located in the north of Ho Chi Minh City, bordering Hoc Mon district in the north; Binh Duong province and Thu Duc district in the east; Tan Binh, Go Vap and Binh Thanh districts in the south; and Binh Tan district, Ba Diem commune in the west.

ii) Terrain

The project site is sloping in the NW to SE direction. The northwest terrain including Tan Chanh Hiep, Dong Hung Thuan wards of District 12 is rather sloping with the altitude of 9.5 – 6m, now the highest one in the site. The northwest terrain including wards 5, 12 and 15 of Go Vap district is lower, approximately 8.5 – 5m.

The site of geological investigation is located on an accumulative, low and relatively flat terrain in regions of Binh Thanh, Phu Nhuan, Go Vap, and District 12 and an accumulative eroded and denuded terrain in regions of Thu Duc district and District 9. The absolute altitude of the terrain is 1.00 – 4.00m in the regions of Binh Thanh, Phu Nhuan, a part of Go Vap, District 12. The regions of District 12, Thu Duc and District 9 have higher altitudes (Source: Topographic investigation report by Saigon Weico in 2007)

b) Geo-technical conditions of the project site

Considering results of the geotechnical investigation by Saigon Weico in the project site via 12 drill holes, it is found that the whole terrain of the study site is located on an accumulative geomorphic zone of products of Quaternary sediments.

All zones to be upgraded are inside densely populated areas, where many facilities have been exploited for many years and even repaired and upgraded to deal with local damages in serve of local traffic. Therefore, a major part of road faces and basements have many stable layers of rubble, macadam, or concrete which are 0.4 – 1.2m thick and have compaction density of $E \geq 350 \text{dN/cm}^2$, lower layers with the depth of 2 to 5m include mix clay, sand mix and cobble with the converted density of 4 to 20dN/cm^2 .

Particularly in Thu Duc, Pleistocene sediment was formed. The sediment formed in Thu Duc is distributed in hillock areas with the altitude from the ground level in the range of +5 to 30m in Thu Duc in District 9 in the northeast of Ho Chi Minh City. Holocene sediment is distributed in the plain terrain continuously with the earth altitude of +0,6 to 1,0m in the suburban low land.

c) Geological and hydrological conditions of the project site

The investigation (22 to 24 December 2006) made drill holes at the zones to be upgraded with the depths as follows:

Table 2.1 – Geological condition of the project site

| No. | Drill hole code | Depth of underground water level (m) |
|-----|-------------------------|--------------------------------------|
| 1 | Binh Thanh district – 1 | 0,30 |
| 2 | Phu Nhuan district – 1 | Not found |
| 3 | Phu Nhuan district – 2 | Not found |
| 4 | Go Vap district – 1 | 0,30 |
| 5 | Go Vap district – 2 | Not found |
| 6 | District 12 – 1 | Not found |
| 7 | District 12 – 2 | 1,00 |
| 8 | District 12 – 3 | 0,80 |
| 9 | District 12 – 4 | 2,00 |
| 10 | Thu Duc district – 1 | Not found |
| 11 | Thu Duc district – 2 | Not found |
| 12 | District 9 - 1 | 2,00 |

2.1.2 Climate and hydrology

a) Climate

The project will be implemented in 6 districts of Ho Chi Minh City, which is located in a zone of subequatorial tropical monsoon. Like provinces in South Vietnam, a general feature of climate and weather in Ho Chi Minh City is high temperative all year round with two distinctive seasons (rainy and dry) which causes strong impact on the environment and landscape. The rainy season is from May to November and the dry season from December to April. According to monitoring data provided by the Statistics Department in 2006 - Tan Son Hoa station, through main meteorological components, climate of Ho Chi Minh City has the characteristics as follows

i) Air temperature:

Air temperature is a factor critical to the existence, emission and conversion of pollutants in the atmosphere. Higher air temperature leads to quicker chemical reactions and shorter existence of air pollutants. In addition, variation in temperature influences the dispersion of dust and emissions, the heat exchange of human body and eventually workers' health.

It is possible to outline the temperature regime as follows:

- Average: 27°C.
- Highest average in a day: 35 - 36°C.
- Lowest average in a day: 24 - 25°C.
- Maximum: 39 - 40°C.
- Minimum: 13°C.

- Variation in a year: 3,4°C.
- High values are usually recorded in the interim of the dry and the rainy season (i.e. March to May).
- The occurrence of air temperatures higher than 29°C is usually lower than 13 - 20 days/month.
- The occurrence of air temperatures lower than 29°C is not more than 10 -17 days/month.

ii) Sunny hours:

- The total in a year: 2488 hours.
- The highest sunny hours are recorded in January through March (8 hours/day on average, highest 12.4 hours/day).
- The lowest sunny hours are in July through October (5.5 hours/day on average).

iii) Solar radiation:

Solar radiation is one of the important factors with direct effects on thermal regime and through which on atmospheric stability and the diffusion – conversion of pollutants in a region. Solar radiation directly changes the temperature of objects in a manner dependent on its capability of reflection and adsorption of radiation, for instant, on coating, color and other superficial characteristics, etc.

It is possible to outline the regime of solar radiation as follows:

- Total solar in a year: 145- 152 kcal/cm²
- Daily average: approximately 417 cal/cm²
- The highest solar radiation is usually recorded in March: 15.69 kcal/cm²
- The lower solar radiation is usually recorded in the rainy season: 11.37 kcal/cm²
- The total solar radiation in the dry season is 100 cal/cm²/day higher than that of the rainy season 100 cal/cm²/day.
- The maximum magnitude of solar radiation is 0.8 – 1.0 cal/cm²/minute which lasts for 10 – 14 hours.

iv) Rainfall:

Rainfall also affects the air quality. Rain catches dust and pollutants present in the atmosphere or runoff water can wash away pollutants on the ground, where rain water flows over. The quality of rain water depends on atmospheric and environmental quality in the region.

Information of rainfall can be outlined as follows

- There are two distinctive seasons, the rainy season from May to the end of October and the dry season from December to April.
- The annual rainfall is 1,949 mm.

- The highest annual rainfall is 2,711 mm and the lowest 1,533 mm and on average, there are 162 rainy days in a year.
- The rainy season accounts for 80 - 85% of the total rainfall.
- The month of the highest rainfall is September (approximately 338 mm with 22 rainy days).
- The month of the lowest rainfall is February (approximately 1 mm). The lowest rainfall in the rainy season is usually observed in June and July.

v) *Relative humidity:*

Air humidity as well as air temperature is one of the factors with direct effects on conversion and diffusion of pollutants in the atmosphere, on heat exchange of human body and on workers' health.

The humidity regime is outlined as follows

- Average: 79,5%
- Highest: 96.8% (in September)
- Lowest: approximately 43% (in February and March)

vi) *Evaporation:*

- Maximum: 1,223 mm (1990)
- Minimum: 1,136 mm (1989)
- Average: 1,169 mm
- Usually evaporation is high in dry season (104,4 - 146,8 mm) and low in the rainy season (64,9 - 88,4 mm), averaging at 97,4 mm/month.

vii) *Wind regime:*

Wind is one of the key factors in diffusion and transfer of pollutants in the atmosphere. When the wind speed is higher, dust and pollutants are transferred over long distance, whereas the possibility of dilution with clean air is higher.

- Dominant wind directions in the site include:
 - SE wind in February, March and April
 - South wind in May
 - West wind in June
 - SW wind in July
 - West wind in August, September and October
 - North wind in November, December and January
- The average wind speed is approximately 2.3 – 4.5 m/s.

Findings:

- *If based on the Pasquil's classification of atmospheric stability, the dominant atmospheric stability is C, and D with level D accounting for 75%.*

- *Air temperature is relatively high and stable all year round, that causes direct effects on the conversion and diffusion of air pollutants and dust in the atmosphere.*
- *The rainfall is relatively high, possibly affecting drainage of surface water, inundation and transfer of pollution by rain water.*
- *The dominant wind directions are NE in the dry season and SW in the rainy season. Therefore, throughout the construction as well as operation phase, the northeast of the project site in the dry season and the southwest in the rainy season are likely to suffer air pollution from activities of the project.*

b) Hydrological conditions

Ho Chi Minh City is located downstream the Dong Nai river system with intermingled canals and arroyos like in the Saigon river system with Lang The canal, Nong pool and other arroyos and canals such as Tra, Ben Cat, An Ha, Tham Luong, Cau Bong, Nhieu Loc – Thi Nghe, Ben Nghe, Lo Gom, Kenh Te, Tau Hu, Kenh Doi. In the south of the city, i.e. in Nha Be and Can Gio, the density of canals is very high. Together with the system of canals of grades 3 and 4 of the East Canal - Cu chi, others such as An Ha, Xang in Binh Chanh have helped for good irrigation and transport. Projects for dredging and upgrading canals are step-by-step realized, taking full advantage of such a rare and precious potential of this big city.

Most rivers and canals in Ho Chi Minh City are affected by the semi-diurnal tide from the South China Sea with the tidal amplitude of 2.5 – 4.0 m. The tidal amplitude increases gradually in the north to south direction. Every day water rises and lowers twice, following which tide deeply penetrates into canals in the city, causing big impacts on agriculture and limited drainage in urban areas.

In the dry season, since the flow rate of rivers are small, saline water with salinity as high as 4‰ can penetrate into the Saigon River to Lai Thieu, and even to Thu Dau Mot in some years and into the Dong Nai River to Long Dai. In the rainy season the flow rate is higher, saline water is pushed back, diluted and salinity becomes far lower.

2.2 STATE OF ENVIRONMENT IN THE PROJECT SITE

2.2.1 State of the air environment

Air pollution is one of the pollution sources strongly affecting the lives of townsman, particularly in big cities, where industries, construction, living activities and transport are effervescent like Ho Chi Minh City. The air quality as measured by *Ho Chi Minh City Environmental Protection Sub-department* at monitoring stations in the city as well as in the project site over many years (The results is attached in annex) can be outlined as follows:

a) Roadside air quality:

- **NO₂**: The annual average of NO₂ concentration at traffic stations was almost not higher than the standard. Only 1.22% of all the data obtained at measuring stations returned 24 h averages of NO₂ higher than the standard (TCVN = 200 µg/m³).

➤ **CO:** The annual average of CO concentration in 2006 increased when compared with that of 2005. The variation of hourly average of CO concentration in 2006 was approximately 0.001 mg/m³ to 28.16 mg/m³. In general, it is higher in year-end months (highest in October, November and December) and falls to minima in March.

b) Air quality in residential areas:

➤ **PM10:** The readings of PM10 in 2006 at residential stations varied in the range of 59 µg/m³ to 94,5 µg/m³, that is higher than the Vietnamese standards TCVN (TCVN-PM10 = 50 µg/m³). The 24-hour average of PM10 at residential stations was higher than the standard (TCVN-24h PM10 = 150 µg/m³) at approximately 2.06% to 9.42% of stations.

➤ **NO₂:** the annual average of NO₂ in 2006 was almost the same at residential stations and more importantly, meeting the standard (TCVN – 1-year NO₂ = 40 µg/m³).

➤ **SO₂:** Monitoring values recorded at measuring stations in 2006 are lower than the standard (TCVN 1-year = 50 µg/m³). In general, the readings in 2006 have not changed, not to say lowered when compared with those of 2005.

c) State of air quality at the zones to be upgraded

The positions of air quality monitoring points in zones to be upgraded in the project site that CEECO monitored in September 2007 are shown in the figures below.

Results of air quality monitoring in zones to be upgraded in the project site that CEECO monitored in September 2007 are shown *Table 2.2*.

Table 2.2 – Results of air quality monitoring in zones to be upgraded

| Position Code (ward) | Sampling point, address | SO ₂ (mg/m ³) | NO ₂ (mg/m ³) | Noise (dB A) | Dust (mg/m ³) |
|---|---|--------------------------------------|--------------------------------------|--------------|---------------------------|
| BINH THANH DISTRICT- 19 September 2007 | | | | | |
| BTH-15 | 3/53 Dien Bien Phu | 0.162 | 0.107 | 62.4 | 0.27 |
| BTH-02 | 195/77 XVNT | 0.085 | 0.066 | 68.7 | 0.18 |
| | TCVN 5937-2005 | 0.35 | 0.2 | - | 0.3 |
| | TCVN 5949-1998 | - | - | 75 | - |
| PHU NHUAN DISTRICT (25-09-07) | | | | | |
| PN- 07 | Alley at end of Cam Ba Thuoc road, 33/2 Cam Ba Thuoc-P7 | 0.056 | 0.072 | 52.3 | 0.14 |
| PN-08 | 270/9 Nguyen Trong Tuyen- Ward8 | 0.106 | 0.086 | 62.8 | 0.18 |
| | TCVN 5937-2005 | 0.35 | 0.2 | - | 0.3 |
| | TCVN 5949-1998 | - | - | 75 | - |
| DISTRICT 9 (28 September 2007) | | | | | |
| Q9-01 | 345 Nam Hoa-Phuoc Long A | 0.068 | 0.049 | 65.0 | 0.23 |
| | TCVN 5937-2005 | 0.35 | 0.2 | - | 0.3 |

| Position Code (ward) | Sampling point, address | SO ₂ (mg/m ³) | NO ₂ (mg/m ³) | Noise (dB A) | Dust (mg/m ³) |
|--|---|--------------------------------------|--------------------------------------|--------------|---------------------------|
| | TCVN 5949-1998 | - | - | 75 | - |
| THU DUC (28 September 2007) | | | | | |
| TĐ-01 | 763/18/1 Kha Van Can, Block, Linh Tay ward | 0.042 | 0.068 | 72.0 | 0.33 |
| TĐ-02 | 51/17 Road 10, Block 4, Linh Chieu ward | 0.098 | 0.078 | 68.2 | 0.21 |
| | TCVN 5937-2005 | 0.35 | 0.2 | - | 0.3 |
| | TCVN 5949-1998 | - | - | 75 | - |
| GO VAP DISTRICT (29 September 2007) | | | | | |
| GV-5 | 174/44/A3 Block 7, Ward 5 | 0.069 | 0.076 | 65.5 | 0.18 |
| GV-15 | 20/220 Thong Nhat | 0.083 | 0.068 | 67.4 | 0.22 |
| GV-14 | 51/6A Pham Van Chieu | 0.065 | 0.056 | 65.9 | 0.13 |
| | TCVN 5937-2005 | 0.35 | 0.2 | - | 0.3 |
| | TCVN 5949-1998 | - | - | 75 | - |
| DISTRICT 12 (29 September 2007) | | | | | |
| Q 12-01 | A162 Group 15-Block 2, Dong Hung Thuan ward | 0.067 | 0.098 | 63.1 | 0.11 |
| Q 12-02 | 134 Block 3 Group 2, Thanh Loc ward | 0.082 | 0.094 | 63.3 | 0.24 |
| Q 12-03 | 63/7 Block 7, Tan Thoi Nhat | 0.056 | 0.074 | 61.2 | 0.17 |
| | TCVN 5937-2005 | 0.35 | 0.2 | - | 0.3 |
| | TCVN 5949-1998 | - | - | 75 | - |

Source: CEECO, September /2007.

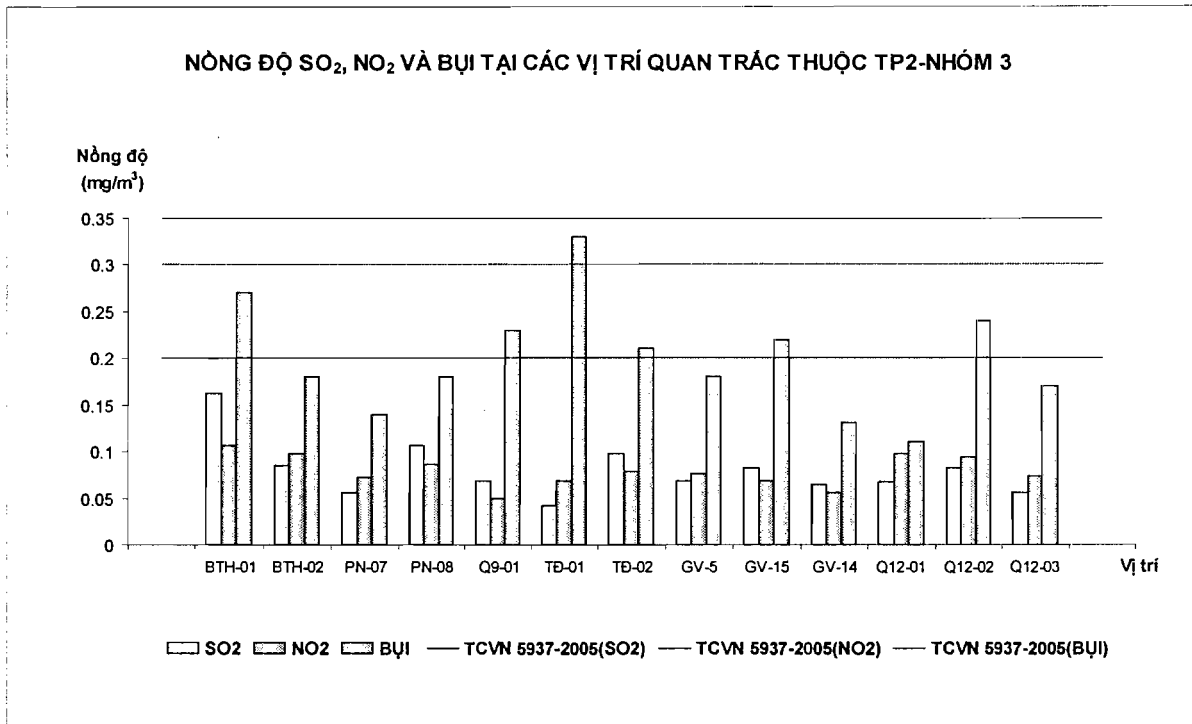


Diagram 2.1 – Measured and analyzed results of SO₂, NO₂, TDS concentration in project area.

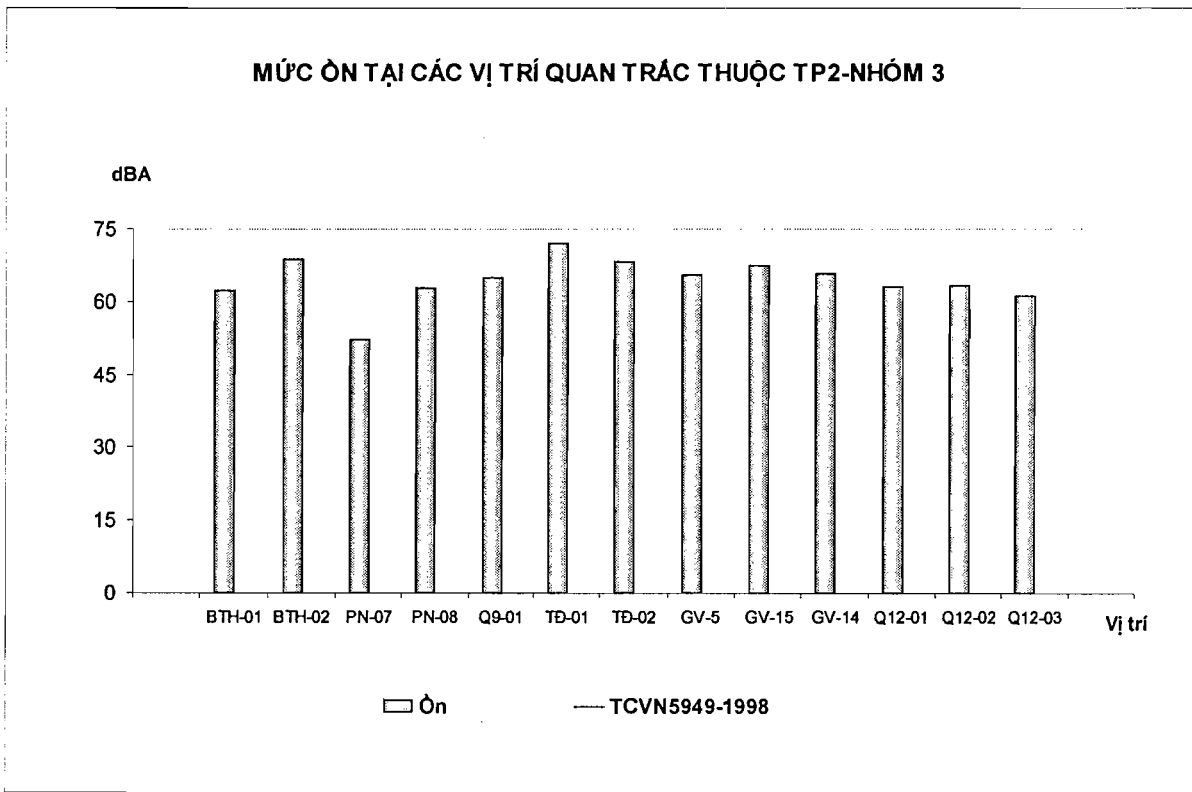


Diagram 2.1 – Measured results of noise in project area.

Comments:

SO₂:

- **Binh Thanh district:** Monitoring data indicated high concentrations of SO₂ in Binh Thanh district with an average of 0.144mg/m³ still they were lower than the allowable limit of 0.35mg/m³.
- **Phu Nhuan district:** The SO₂ concentration average was 0.081mg/m³ with inconsiderable variation and the highest value was 0.106mg/m³ and the lowest 0.056mg/m³.
- **District 9:** In District 9 there is only one zone in Phuoc Long A to be upgraded, and monitoring results showed the SO₂ concentration there at approximately 0.068mg/m³, i.e. far lower than the Vietnamese standard TCVN 5937-2005.
- **Thu Duc district:** SO₂ concentration varied in the range of 0.042 to 0.098mg/m³ with the average of approximately 0.070mg/m³.
- **Go Vap district:** The SO₂ concentrations measured at the zones to be upgraded in Go Vap district were as high as 0.083mg/m³ and as low as 0.065mg/m³ with the average of approximately 0.072mg/m³.
- **District 12:** The SO₂ concentration average was 0.068mg/m³, far lower than the allowable limit.

Considering the aforementioned results, it is found that SO₂ concentrations at the zones to be upgraded are lower than the regulatory standard TCVN 5937-2005 (0.35mg/m³) though the concentration of SO₂ at Binh Thanh district is higher than those of other districts still it is lower than the allowable limits.

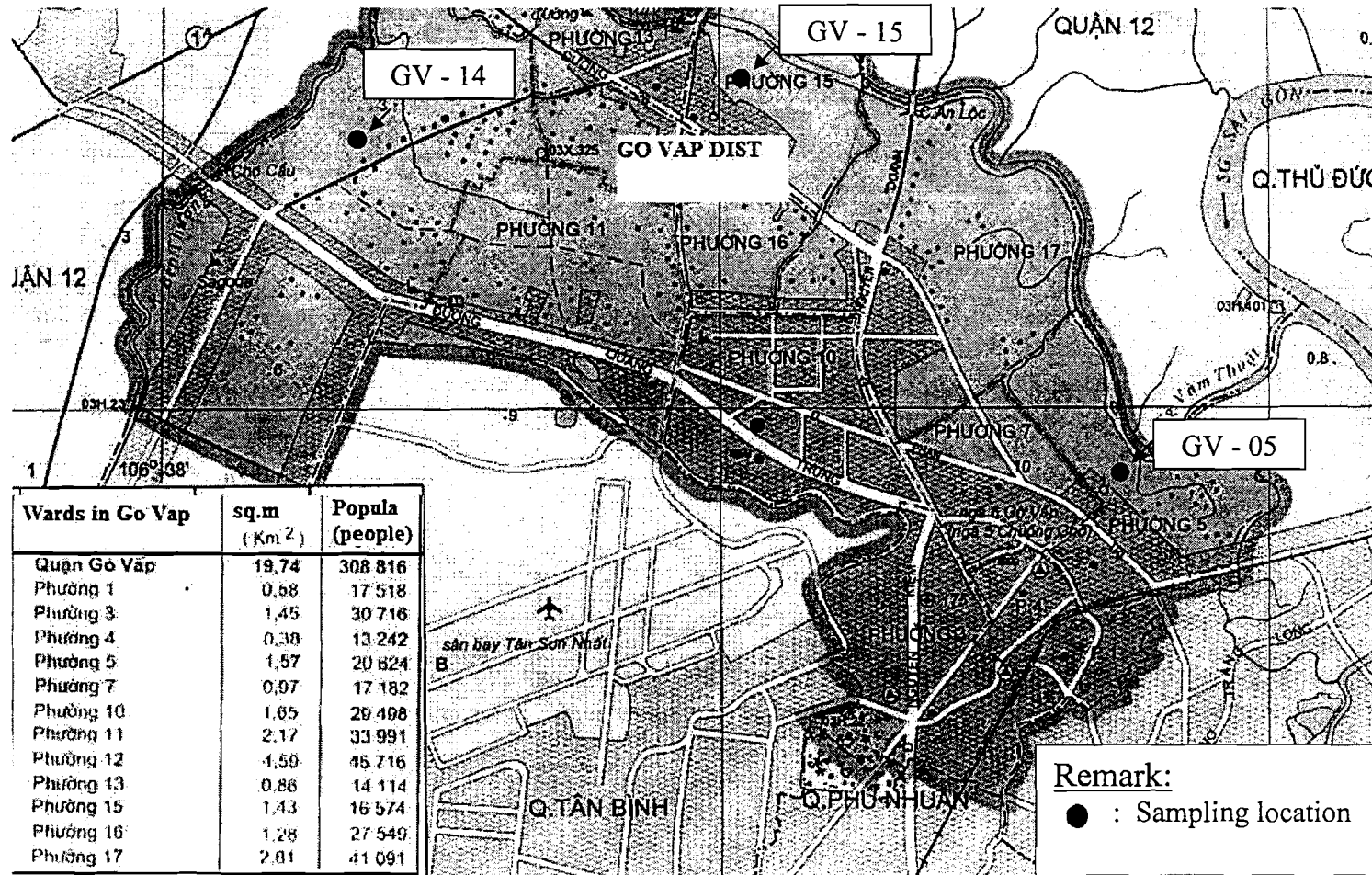
NO₂:

- **Binh Thanh district:** the NO₂ concentration varied in the range of 0.098 to 0.107mg/m³. The average of NO₂ concentration was approximately 0.103mg/m³.
- **Phu Nhuan district:** The NO₂ concentration average was 0.079, 4 fold as low as lower TCVN 5937-2005 (0.2mg/m³). The highest value was measured at PN-08 (0.086mg/m³) and the lowest at PN-07 (0.072mg/m³).
- **District 9:** the NO₂ measured in District 9 was 0.049mg/m³, more than 4 fold as low as TCVN 5937-2005 (0.2mg/m³).
- **Thu Duc district:** the average was 0.073mg/m³, far lower than the allowable limit.
- **Go Vap district:** the average was 0.066mg/m³. The highest SO₂ concentration was 0.076mg/m³ and the lowest 0.056mg/m³. All were far lower than the allowable limit.
- **District 12:** the average was 0.088mg/m³, which was lower than the Vietnamese standard TCVN 5937-2005.

Dust: The dust contents measured in Phu Nhuan district, District 12, Go Vap district, and District 9 varied below the allowable limit of TCVN 5937-2005, from 0.11 to 0.27mg/m³, yet at Ward 1 Thu Duc district (0.33mg/m³) and Ward 15 Binh Thanh district (0.34mg/m³) the dust contents measured during the monitoring period exceeded the allowable limit. It was explained that road quality in those zones is poor and the running of vehicles produce dust, affecting the air environment therein.

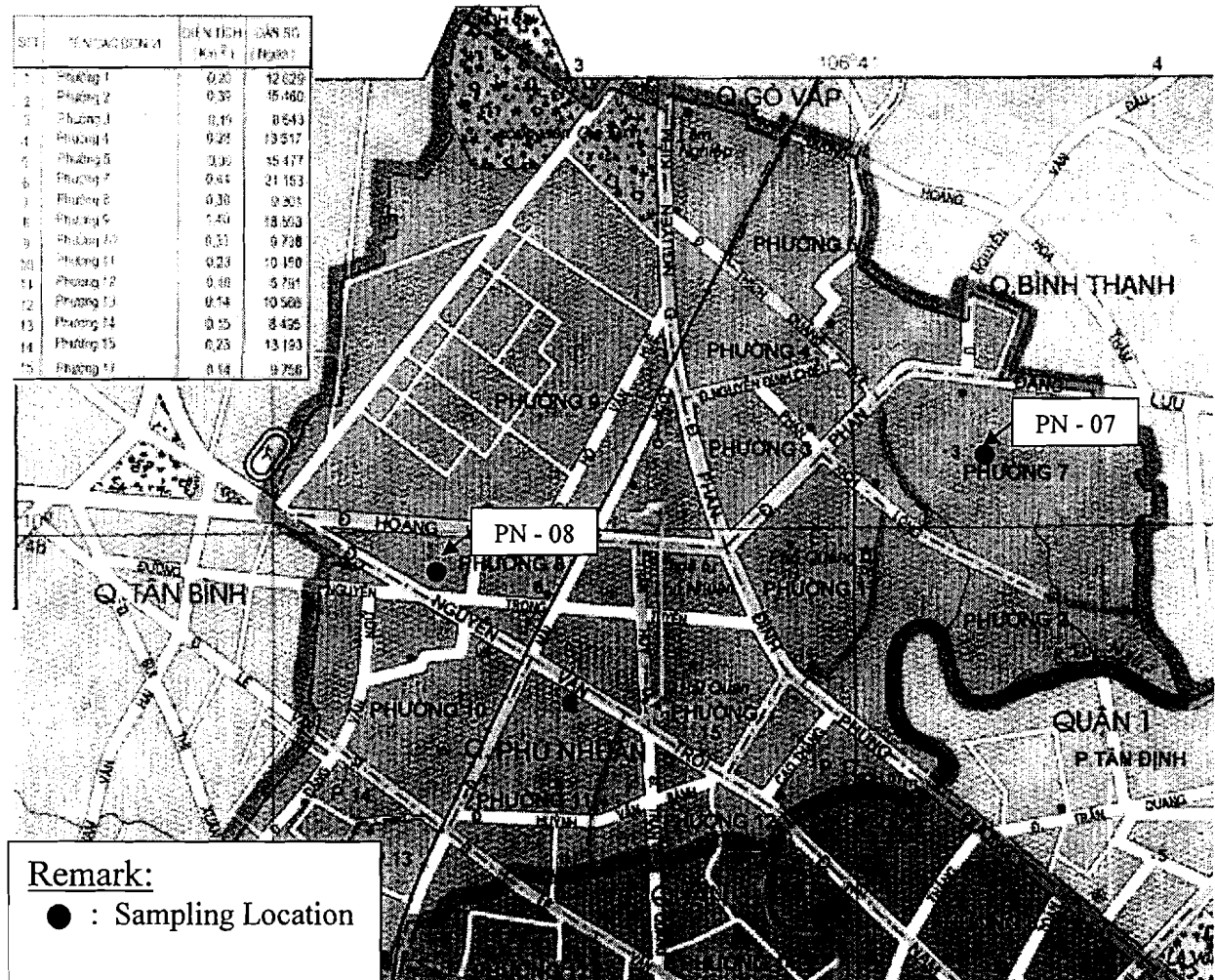
Noise: Monitoring results indicated that the noise levels at the zones to be upgraded were lower than the allowable limits with inconsiderable variation.

Figure 2.1. Locations of sampling of noise and air quality in Go Vap District, TV2-TP2



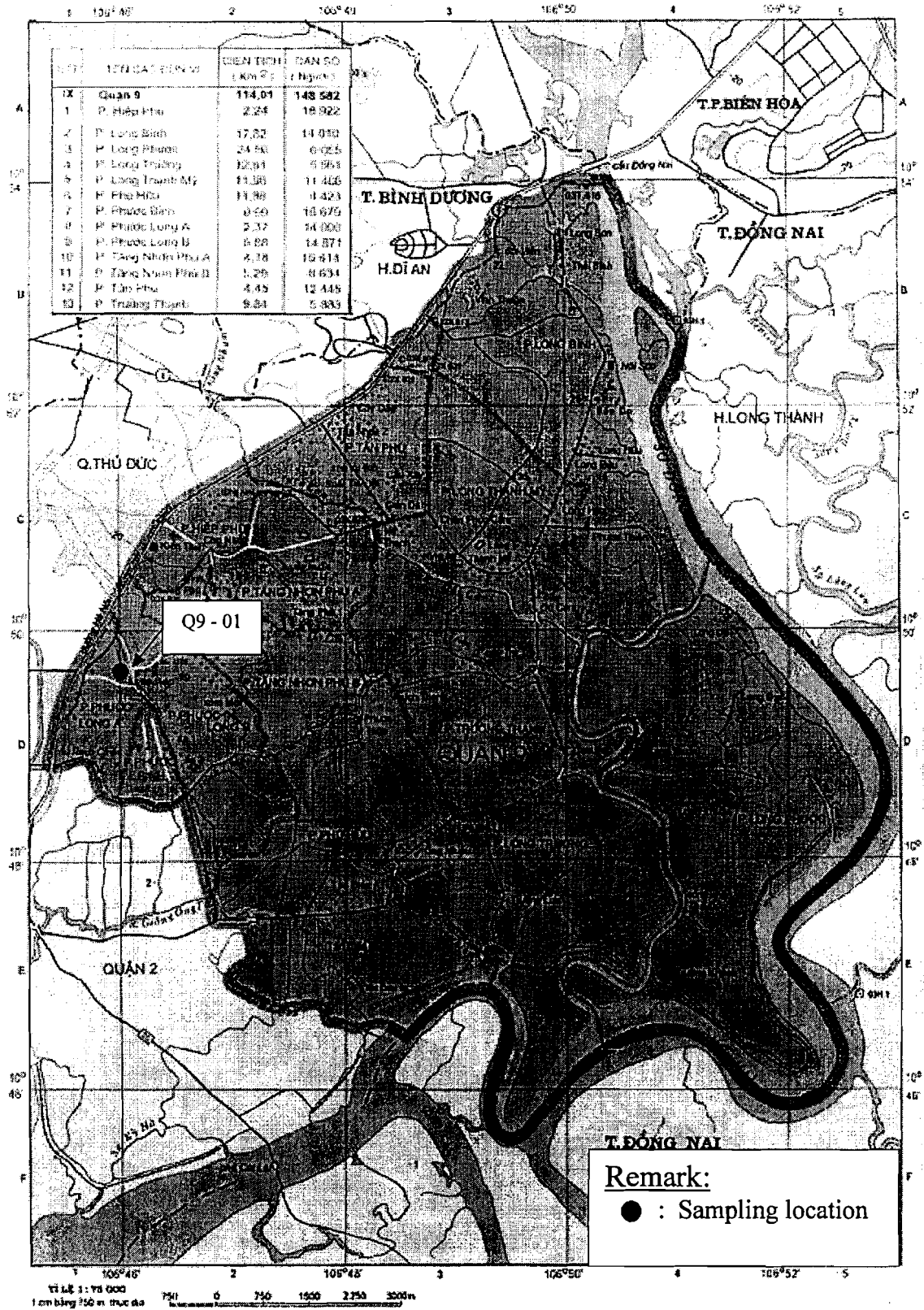
| Sample Code | Address | Area Code |
|-------------|--|-----------|
| GV-05 | 174/44/A3, Residential Block 7, Ward 5 | GV.02 |
| GV-14 | 51/6A Pham Van Chieu Str., Ward 14 | |
| GV-15 | 20/220 Thong Nhat Str., Ward 15 | GV.03 |

Figure 2.2. Locations of sampling of noise and air quality in Phu Nhuan District, TV2-TP2



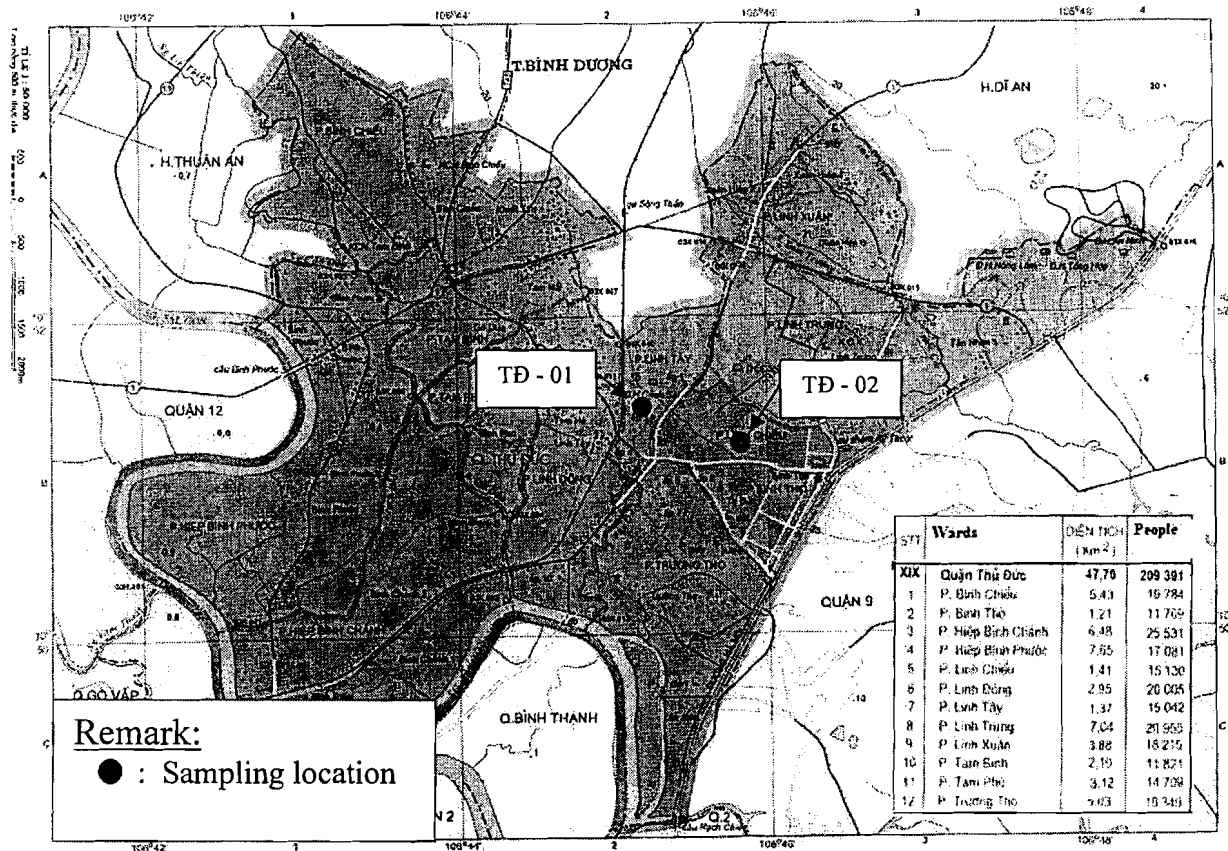
| Sample Code | Address | Area Code |
|-------------|---------------------------------------|-------------------------|
| PN-07 | 33/2 Cam Ba Thuoc, Ward 7 | PN.02 PN.04 PN.05 |
| PN-08 | 270/9 Nguyen Trong Tuyen Str., Ward 8 | PN.03 |

Figure 2.4. Locations of sampling of noise and air quality in District 9, TV2-TP2



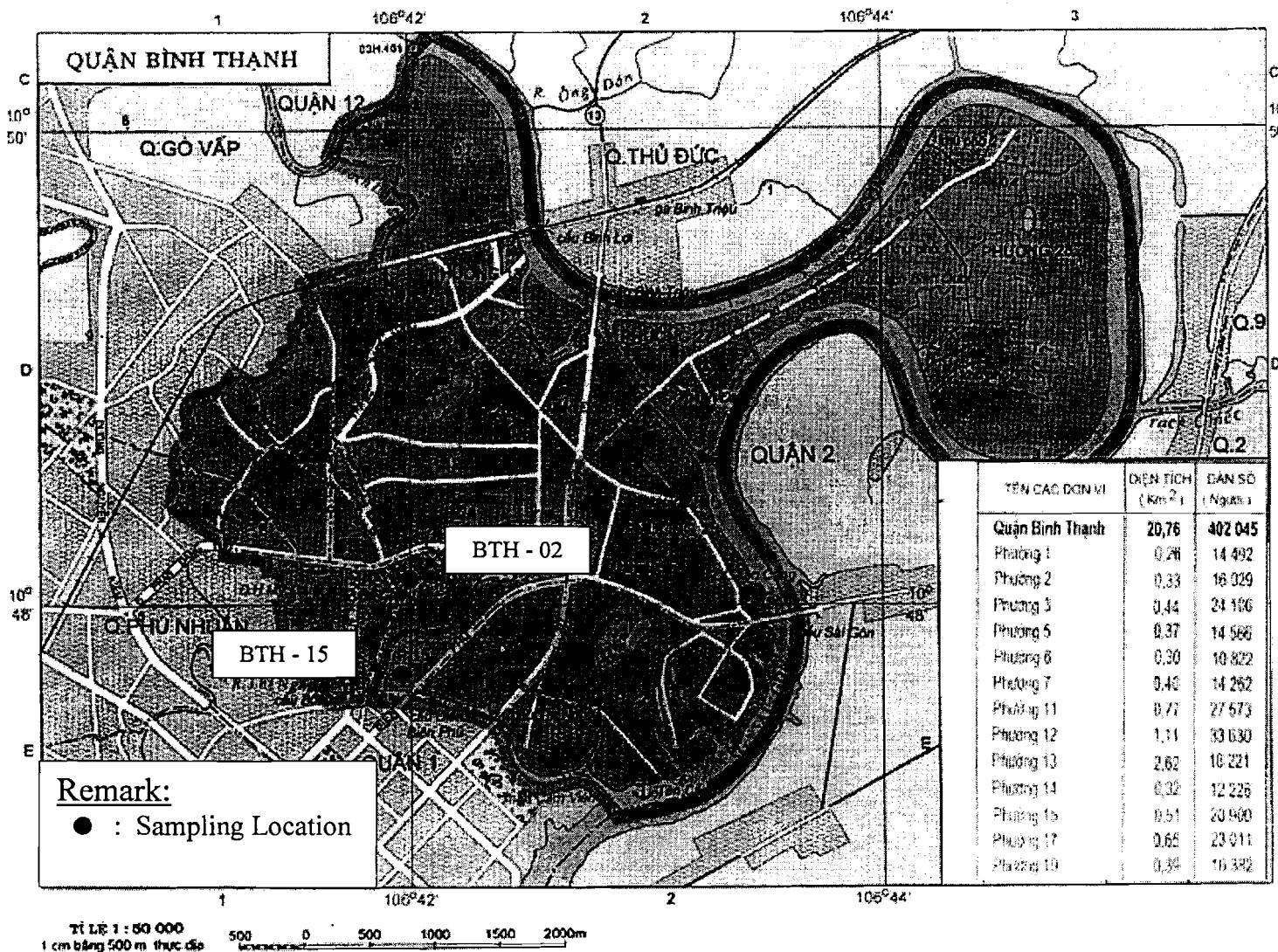
| Sample Code | Address | Area Code |
|-------------|--------------------------------|-----------|
| Q9-01 | 345 Nam Hoa, Phuoc Long A Ward | 09.02 |

Figure 2.5. Locations of sampling of noise and air quality in Thu Duc District, TV2-TP2



| Sample Code | Address | Area Code |
|-------------|---|-----------|
| TĐ-01 | 763/18/1 Kha Van Can Str., Residential Block 2, Linh Tay Ward | TĐ.05 |
| TĐ-02 | 51/17 Street No. 10, Residential Block 4, Linh Chieu Ward | TĐ.06 |

Figure 2.6. Locations of sampling of noise and air quality in Binh Thanh District, TV2-TP2



| Sample Code | Address | Area Code |
|-------------|--------------------------------------|-----------|
| BTH-02 | 280/110/2 Bui Huu Nghia Str., Ward 2 | BT.02 |
| BTH-15 | 3/53 Dien Bien Phu, Ward 15 | BT.05 |

2.2.2 State of the water environment

a) State of surface water

According to the report on water quality monitoring of the monitoring network of Ho Chi Minh City in 2006, the state of surface water of urban drainage systems is typically shown by monitoring stations of at bridges of Tham Luong and An Loc (Tham Luong canal – Vam Thuat River); Le Van Sy and Dien Bien Phu (Nhieu Loc – Thi Nghe canal)

i) State of water quality at Tham Luong and An Loc stations (Tham Luong canal – Vam Thuat river)

- **pH:** the average pH in 2006 at Tham Luong station (TL) and An Loc station (AL) was approximately 6.8 – 7.3, meeting the standard on surface water class B – surface water for other purposes (TCVN 5942-1995, pH=5,5 -9,0).
- **Dissolved oxygen:** The DO (dissolved oxygen) concentrations measured in 2006 at Tham Luong station and An Loc stations (Tham Luong canal – Vam Thuat arroyo) varied from 1.0 to 3,3mg/l). In details, Tham Luong station showed DO that failed to meet the standard on surface water class B (TCVN 5942-1995: $DO \geq 2\text{mg/l}$), whereas the DO at An Loc station (high water) met the standard on surface water class B (TCVN 5942-1995: $DO \geq 2\text{mg/l}$). The DO even fell to zero, meaning that pollution there was very heavy.

In comparison with the DO analyzed in 2006, the DO measured at An Loc station this time was almost stable, whereas the DO at Tham Luong station in 2006 increased approximately 2.4 times. That the DO measured during high water was higher than that of low water is resulted from the dilution of the contaminated flow by high water from the Saigon River.

- **Chemical oxygen demand (COD):** The COD measured at Tham Luong station and An Loc station in 2006 was 62 to 188mg/l. Measuring results from the two stations in both high water and low water indicated that COD was 1.8-5.4 fold as high as the standard on surface water class B (TCVN 5942-1995: $COD \leq 35\text{mg/l}$). Compared with that of 2005, the COD in 2006 at Tham Luong station increased by 1.1 times but in general, COD tends to decrease when compared with that of the same point of time in the period of 2001 – 2004. Particularly, An Loc station showed COD decreasing 1.3 times and being lower than that of the period of 2001 – 2003.
- **Biological oxygen demand (BOD₅):** Organic pollution of watercourses is also shown via BOD₅. The BOD₅ measured at Tham Luong station and An Loc station in 2006 varied in the range of 19 to 63mg/l. An Loc station showed BOD₅ 2.5 fold as high as the standard (surface water standard TCVN 5942 – 1995, class B: $BOD_5 \leq 25\text{mg/l}$), whereas the average BOD₅ in 2006 at Tham Luong station met the standard class B (TCVN 5942-1995).

Compared with 2005, the average of BOD₅ in 2006 at Tham Luong station and An Loc station decreased by 1.4 – 2.2 times, and tends to decrease when compared with that of the period of 2001 – 2004.

- **Bacterial pollution:** Analyses show the average of Coliform in 2006 at stations on Tham Luong canal – Vam Thuat arroyo in the range of 11×10^6 to $1,0 \times 10^{15}$ MPN/100ml, that is 11×10^2 – $1,0 \times 10^{11}$ fold as high as the standard on surface water class B (TCVN 5942-1995 Coliform = 10.000 MPN/100ml).

Compared with analyzing results in 2005, the average of total Coliform in 2006 at stations on Tham Luong canal - Vam Thuat arroyo increased by 3 – 113 times and tend to increase when compared with the period of 2001-2004.

ii) State of water quality at Le Van Sy and Dien Bien Phu stations (Nhieu Loc – Thi Nghe canal)

pH: pH averages at Le Van Sy (LVS) and DBP (Dien Bien Phu) stations in 2006 varied around 6.8, meeting the standard on surface water class B – surface water for other purposes (TCVN 5942 – 1995, pH = 5.5 – 0.0)..

Dissolved oxygen (DO): Analyzing results of DO (dissolved oxygen) average in 2006 at two stations in Nhieu Loc – Thi Nghe varied in the range of 0 – 2,9 mg/l. It is noteworthy that the DO measured in both high and low waters at LSV station fell to zero, meaning that it failed to meet the standard on surface water class B (TCVN 5942-1995 : $DO \geq 2$ mg/l) and even in high water, only DBP station showed DO (=7,0 mg/l) meeting the standard on surface water class B. The DO average concentration in 2006 at DBP station increased 1,5 times when compared with 2005 and the increasing tendency continued when compared with the same periods of 2001 through 2004. Particularly, LVS station showed DO at zero, lower than the same period of 2001 through 2005.

- **Chemical oxygen demand (COD):** the COD at LVS and DBP stations varied in the range of 72 – 151 mg/l, 2.0 – 4.3 times as high as the standard class B (TCVN 5942-1995 : $COD \leq 35$ mg/l). In comparison with analyzing results of COD average in 2005, the COD measured at DBP station in this monitoring course was stable, reducing by 1.1 times still it was higher than that of the period from 2001 to 2004. LVS station indicated COD increasing by 1,1 times and slightly increasing when compared with those of the period 2001-2004.
- **Biological oxygen demand (BOD):** The average of BOD₅ at LVS and DBP stations in 2006 varied in the range of 21 – 44 mg/l, approximately 1,8 times as high as the standard on surface water class B (TCVN 5942-1995 : $BOD_5 \leq 25$ mg/l). Nevertheless, when compared with results in 2005, the average of BOD₅ in 2006 measured at stations on Nhieu Loc – Thi Nghe canal reduced by 1.0 – 1.2 times with a decreasing tendency from the period of 2001-2005
- **Bacterial pollution:** the Coliform average at Tham Luong canal – Vam Thuat arroyo in 2006 varied in the range of 1×10^{12} – 20×10^{12} MPN/100ml, 10^8 – 20×10^8 fold as high as the standard on surface water class B (TCVN 5942-1995 Coliform = 10.000 MPN/100ml). Compared with analyzing results in 2005, the Coliform in the monitoring course of 2006 was 11 – 28 fold higher with an increasing tendency from the period of 2001-2004.

iii) State of water quality of Vam Thuat arroyo – the section to receive wastewater GV02

Unlike a major part of the zones to be upgraded in the project which are connected with primary infrastructure, which means the common sewer of the city, some zones in Go Vap district are connected to Vam Thuat arroyo. In order to assess the water quality of this arroyo, the consultant took samples at 3 points in the section that receives wastewater from the zones to be upgraded in Go Vap district. Analyzing results thereof are shown in Table 2.3. Location of sampling of surface water is presented in Annex.

Table 2.3 - Water quality of Vam Thuat arroyo in October 2007

| Parameter | Unit | VT-1 | | VT-2 | | VT-3 | | TCVN 5942-1995 | |
|---------------------------------|-------------------------|---------------------|--------------------|---------------------|---------------------|---------------------|---------------------|----------------|---------|
| | | Low water | High water | Low water | High water | Low water | High water | A | B |
| pH | | 6.71 | 6.84 | 6.82 | 6.83 | 6.70 | 6.88 | 6 – 8.5 | 5.5 - 9 |
| Turbidity | FTU | 78 | 51 | 64 | 43 | 37 | 28 | - | - |
| Alkalinity | mg CaCO ₃ /L | 86 | 64 | 72 | 55 | 46 | 33 | - | - |
| Acidity | mg CaCO ₃ /L | 4.7 | 2.6 | 5.2 | 3.3 | 3.4 | 2.1 | - | - |
| SS | mg/L | 236 | 138 | 167 | 135 | 210 | 158 | 20 | 80 |
| DO | mg/L | 0.4 | 1.1 | 1.8 | 2.4 | 2.2 | 2.5 | ≥ 6 | ≥ 2 |
| COD | mg/L | 53 | 48 | 46 | 41 | 36 | 29 | < 10 | < 35 |
| BOD | mg/L | 37 | 31 | 29 | 27 | 21 | 15 | < 4 | < 25 |
| N-NH ₄ ⁺ | mg/L | 2.26 | 2.76 | 2.15 | 1.84 | 1.96 | 1.68 | 0.05 | 1 |
| N-NO ₂ | mg/L | 0.018 | 0.014 | 0.012 | 0.016 | 0.009 | 0.008 | 0.01 | 0.05 |
| N-NO ₃ | mg/L | 0.34 | 0.29 | 0.32 | 0.24 | 0.15 | 0.12 | 10 | 15 |
| P-PO ₄ ³⁻ | mg/L | 1.24 | 0.89 | 0.68 | 0.54 | 0.84 | 0.59 | - | - |
| Oil and fat | mg/L | 0.15 | 0.24 | 0.17 | 0.11 | 0.06 | 0.03 | 0 | 0.3 |
| Cd | (µg/l) | 0.34 | 0.21 | 0.18 | 0.43 | 0.22 | 0.26 | 10 | 20 |
| Pb | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.05 | 0.1 |
| T. Coliform | MPN/100 ml | 24x 10 ⁵ | 9x 10 ⁵ | 14x 10 ⁴ | 43x 10 ⁵ | 0.48 | 0.72 | 5000 | 10000 |
| As | (µg/l) | 0.69 | 0.57 | 0.62 | 0.43 | 11x 10 ⁴ | 93x 10 ³ | 50 | 100 |

Source: CEECO, October 2007.

Note: VT-1 : Near An Loc bridge over Vam Thuat arroyo
 VT-2 : Confluence of Lang arroyo – Vam Thuat arroyo
 VT-3 : Vam Thuat arroyo (downstream of Rach Lang – Vam Thuat confluence)

Analyzing results indicate that:

pH and acidification: Monitoring data indicated that the pH at monitoring points in the project site varied in the range of 6.70 to 6.88, meeting the standard applicable to water used for living (Source class A)

Organic pollution (DO, BOD, COD): Heavy organic pollution was measured at An Loc bridge and Truong Dai with the former being the heaviest.

- *DO*: Organic pollution can be evaluated indirectly via dissolved oxygen (DO). The results of DO measurements varied in the range of 0.4-2.5 mg/l. Monitoring data indicated apparent reduction of DO in ebb tide. Monitoring results also indicated that the concentration of dissolved oxygen in the regions of An Loc bridge and Truong Dai failed to meet the Vietnamese standard applicable to water used for living (TCVN 5942-1995 source class B).

- *BOD*: Biological oxygen demand (BOD) is an important parameter for assessing the pollution of watercourses due to unstable organic matters. The presence of organic matters in water is originated from various causes, for instance natural decomposition of creatures, receipt of sanitary wastewater from residential or urban areas in the basin. The BOD average in the project site varied in the range of 21-37 mg/l. According to TCVN 5942-1995 applicable to surface water used for living (source class B) BOD should be < 25mg/l. As such, the BOD at the 2 regions of An Loc bridge and Truong Dai failed to meet the Vietnamese Environmental Standard applicable to water supply, except for the region of Vam Thuat estuary.

- *COD*: the COD measured at monitoring points varied in the range of 29mg/l to 53mg/l with value in rising tide far lower than that of ebb tide but both COD values in rising and ebb tides at An Loc bridge and Truong Dai were higher than the Vietnamese Environmental Standard applicable to water used for living (TCVN 5942-1995, source class B: BOD < 35mg/l),

Eutrophication (NH_4^+ , N-NO_3^- , N-NO_2^- , P-PO_4^{3-}): Eutrophication is mostly caused by high concentrations of nitrogen (N) and phosphorus (P), which are mainly due to sanitary wastes from residential areas and some manufacturing entities.

- *Concentration of nitrates (NO_3^-)*: varied in the range of 0.12 mg/l to 0.34 mg/l, which is many fold as low as the Vietnamese Environmental Standard (TCVN 5942-1995, source class A: 10mg/l). Similarly, the concentration of N-NO_2^- was far lower than the allowable limit.

- *Concentration of NH_4^+* : varied in the range of 1.68mg/l to 2.76mg/l, the concentrations of NH_4^+ in the project site in both rising and ebb tides were very high, many fold s high as the Vietnamese Environmental Standard applicable to water used for living.

Suspended solid (SS): Increases in people's construction activities as well as others will increase turbidity and suspended solid which will be detrimental to living of shrimp and fish. In general, shrimp and fish cannot live in watercourses where suspended solid content is 2000 mg/l. Suspended solid (SS) at monitoring points was much higher than the allowable limit. The highest SS was recorded during ebb tide. The SS average was 174mg/l, twice as high as the standard on water used for living and drinking (TCVN 5942-1995, source class B).

Oil and fat: Oil, fat and fuel poured into watercourses as a result of riverside construction are causative of negative impacts on the environment and aquatic biota. In the project site,

oil pollution is caused by waterway, sanitary wastewater and industrial effluent. In the project site, the analyzed contents of oil and fat varied in the range of 0.03 to 0.24mg/l, which was lower than the allowable limit applicable to water sources used for living (TCVN 5942-1995, source class B)

Bacteria: Monitoring results found in the project site bacteria contents much higher than the Vietnamese standard applicable to surface water used for living (TCVN 5942-1995 source class B).

Heavy metals: Due to high toxicity, heavy metals (Hg, Pb, Cr, Cd, As) can affect human health and living of aquatic creatures. The Vietnamese standards applicable to Pb, Cd, As in water supply are 0.05mg/l, 0.01mg/l and 0.05mg/l, respectively. Results from analyses of heavy metals in water in the project site were far lower than the Vietnamese standard. Therefore, it is possible to assess that there is no sign of pollution due to heavy metals in river water.

ix) State of underground water

Based on the 2006 report on Ho Chi Minh City environmental quality monitoring, the quality of underground water in the project site is outlined as follows

pH: the pH measured during this monitoring course varied from 4.4 to 6.5. As such, over monitoring courses, the pH measured at stations is almost stable, i.e. without significant change. Usually, underground water has low pH and it is treated so as to be suitable for specific uses.

Iron: The average of total iron content measured at stations in 2006 was 0.20 to 46.93 mg/l. At Truong Tho (GMS4) and Dong Hung Thuan (GMS5) stations, although the total iron contents were high (20.52 and 26,95 mg/l, respectively), exceeding the standard on underground water (TCVN 5944 – 1995, Fe: 1 – 5 mg/l) yet compared with the monitoring results in 2005, the total iron contents at those wells reduced by 1.28 – 3.42 times.

Saline contamination: The saline contamination at most wells in the city is relatively stable and not higher than relevant standard (TCVN 5944-1995, TDS: 750-1500 mg/l) The TDS average in 2006 at stations varied in the range of 102.38 – 6776.36 mg/l.

Hardness: The hardness of water in the upper groundwater in Ho Chi Minh City was firstly included in the monitoring program in 2004. All stations in the project site showed hardness meeting the standard.

Nutrients (NO₃⁻, NH₄⁺, P): the content of Nitrate (NO₃⁻) measured in monitoring courses of 2006 all met the standard on underground water (TCVN 5944 – 1995, NO₃⁻: 45mg/l). Although Vietnamese standards do not provide the allowable limits of total phosphorus (P) of underground water but the total P as measured at stations (0,05 – 0,48 mg/l) was considered low. Underground water in this region has sign of severe ammonium pollution with the content of 257.74mg/l measured in 2006, that is much higher than that of 2005. Therefore, attention should be paid to the variation of NH₄⁺ content in subsequent

monitoring courses so as to give alarming to the use of underground water from this region in due time

Total organic carbon (TOC): The TOC as monitored at stations in 2006 varied in the range of 2.92 – 168.14mg/l.. Dong Hung Thuan station still showed high organic pollution with an increasing tendency. Monitoring stations in the project site showed TOC in 2006 higher than that of 2005.

Heavy metals: The analyzed heavy metal parameters include Al, Cu, Cd, Ni, Hg, As, Cr. Only the analyzing results of Al were high at Dong Thanh and Linh Trung stations (GMS3) (4.16 and 8.67mg/l, respectively). Other parameters were lower than the limits of the standard on underground water (TCVN 5944 – 1995)

Bacteria: Analyses of Coliform and Fecal Coliform in 2006 showed one course where those parameters failed to meet the standard on underground water (TCVN 5944 – 1995, Coliform: 3 MPN/100ml, Fecal Coli: 0 MPN/100ml). In details, that was recorded at GMS3, GMS4, GMS5, GMS6 (An Loc bridge–Go Vap district) and furthermore, GMS4 and GMS5 were the two stations with bacteria parameters exceeding the standard in two consecutive monitoring courses in the 2nd and 3rd quarters of 2006.

In general, except of some monitoring courses that gave out high results of bacteria parameters at some stations, bacterial pollution of the shallow layers of underground water in Ho Chi Minh City is still not alarming since a major part of bacterial analyses show stable results that meet the standard.

2.2.3 State of biota

According to the report on the study for perfecting biological parameters used for quality evaluation, zoning and classification of watercourses in Ho Chi Minh (by Vietnam Environment and Sustainable Development Institute in 2004), all rivers and canals in Ho Chi Minh City are strongly affected by tides from the South China Sea, i.e. semi-diurnal tide with amplitude of 2.5 to 4.0 m. The tidal amplitude increases gradually in the north to south direction. As such, a major part of canals in Ho Chi Minh City is intruded by saltwater or has saline origin. That is an ecological condition decisive to the determination of biological parameters used for quality evaluation, zoning and classification of watercourses. Summarization of investigation results of this study as well as reference materials returned the list of the basic and prevailing species components in watercourses of Ho Chi Minh City as follows.

- Phytoplankton : 851 species.
- Zooplankton: 139 species and 12 forms of larvae.
- Zoobenthos – benthos big invertebrate: 140 species.

Since the water quality of rivers and canals changes significantly in accordance with tidal cycles, zooplankton and phytoplankton also change in species composition and density, whereas the growth of big benthos invertebrate species is almost stable. The species composition of zoobenthos in watercourses in Ho Chi Minh City does not change much in a year but there are changes in narrow distributions in accordance with salinity, i.e. in the rainy

season and the dry season. Some species even change together with tidal cycles. In flood tide the saltwater species are dominant and in ebb tide the fresh water species are dominant.

2.3 SOCIO-ECONOMIC CONDITIONS OF THE PROJECT SITE

2.3.1 Overview of the socio-economic conditions of the project site

The study site of the project belonging to the chartering package TV2-TP2 includes 24 LIAs over 208ha in 6 districts, namely 9, 12, Phu Nhuan, Binh Thanh, Thu Duc and Go Vap. In December 2006, Saigon Weico as the consultant investigated the socio-economic state of the project site (with 638 households of 3,140 members) with results given below.

a) District 9

The district had the area of 11,362 ha and the population of 126,220 people when it was established. District 9 is located in the east of Ho Chi Minh City, about 7 km from the city center via Hanoi highway. It borders Nhon Trach district – Dong Nai province over the Dong Nai River in the east, Thu Duc district in the west, District 2 and the Dong Nai River in the south, and Bien Hoa City – Dong Nai province in the north.

- *Economic development:* (i) Trade and service: In the first 6 months of 2006, the trade and service sector kept a good growth rate. In such a period near the Lunar New Year and other holidays, the demands for consumption, service and recreation were on the rise and consequently the turnover of the sector soared up, meeting 53.32% of the year's plan, increasing by 35.38% over the same period of the preceding year; with the trade growing by 36.33% and services 5.67%; (ii) Industry and handicraft: In the first 6 months, the total production values of the industry and handicraft sector met 50.84% of the year's plan, growing by 14.01% over the same period of the preceding year; (iii) Agriculture: The Winter-Spring harvest reached the average yield of 3.1 ton per hectare. Compared with that of 2004, the agriculture sector has cultivation area reducing by 33.07% output 39.73%. The area of orchards has been expanded with 5.6 ha of miscellaneous areas converted into orchards in the first six months; not to say 45.58 ha newly established. In the breeding sector, the total number of cows increased by 2.75%, and that of goats by 62.37%. In contrast, the number of pigs reduced by 12.19% over the same period of the preceding year; and that of turtles reduced by 7.10%. Agriculture has been pushed forwards and at present, the water surfaces include 176.37 ha for fish, 9.34 ha for spawn. In the Tac River, 42 households have 83 float cages for breeding fish. Breeding of gold fish has been developed in 1.13 ha (by some households in wards of Long Binh, Tang Nhon Phu A and Long Thanh My).

- *Budget collection and expenditure:* In the first 6 months, both budget collection and expenditure increased. The total collection to the state budget has met 60.74 % of the year's plan and the percentage of expenditure was 55%. Noticeably, the expenditure on investment reached 72.5% of the year's plan and routine payment 50.82 %.

- *Cultural and social activities:* In the first 6 months, the district organized the District Sport Games, a walk "for the poor" with more than 1000 participants who donated 7 million dong. Activities of public sports associations have been well maintained with 98.7% inhabitant exercises. The district mobilized inhabitants to part take in 23 contexts at the city level, winning 25 gold medals, 39 silver medals, and 26 bronze medals; and to partake in the parade in the opening of Ho Chi Minh City Sport

Games. Activities of information and propaganda, arts performance, etc. were organized in the occasions of the Lunar New Year as well as other national holidays. The program of grass-root cultural life is continued, and 5 years of the movement “building up cultural life” is summarized. Health care activities are well done, ensuring community health care with 220,976 people diagnosed and treated, meeting 44% of the year’s plan. The plan for building schools meeting national standards from 2005 to 2010 is accomplished. In the first 6 months the city approved 02 schools as meeting national standards (Phong Phu primary school and Hoa Lu junior high school). Two communal education centers are built in 2 wards (Long Binh and Truong Thanh). Return credited people’s favor and care of the poor, aged and disabled people are the two big policies that the district has actively implemented. The hunger eradication and poverty alleviation program is continued, the district has investigated income of poor households, mobilizing for the hunger eradication and poverty alleviation fund.

b) District 12

Over 5,274.89 ha and with the population of 307,449 people (by March 2006). District 12 is divided into 10 wards, namely An Phu Dong, Dong Hung Thuan, Tan Thoi Nhat, Tan Chanh Hiep, Thanh Loc, Thanh Xuan, Tan Thoi Hiep, Hiep Thanh, Thoi An and Trung My Tay. The district is located in the north of Ho Chi Minh City, bordering Hoc Mon district in the north; Binh Duong province and Thu Duc district in the east; Tan Binh, Go Vap and Binh Thanh districts in the south; and Binh Tan district, Ba Diem commune in the west. Located in the northwest gate of the city with a system of good roads including National Road 22 (now Truong Chinh street), the outer beltway (now National Road 1A), provincial roads 9, 12, 14, 15, 16, and a dense systems of suburban roads, District 12 has favorable infrastructure for socio-economic development.

- *Economic development:* (i) Trade and service: The total sales of trade and service in 2006 reached VND1,893.956 billion, increasing 19.24% over 2005, meeting 101.04% (1.893,956 /1880) of the 2006 plan; (ii) Industry and handicraft: The industrial production in 2006 was VND1,380.479 billion, growing 17.23% over 2005 (16% over the year plan). The growth was mainly resulted from limited and private companies which won more contracts and employed new technologies and machines for higher production yields. The increase in production value over 2005 was mostly in key sectors such as food processing, beverage, garment and textile, and metallic products; (ii) Agriculture: The total production in 2006 (fixed prices) was estimated at VND62.097 billion, inching up by 0.16% over 2005 (it was planned to reduce by 1% over 2005). The value of services for agriculture reached VND 2,132 billion, increasing by 4% and the value of aquaculture production also increased by 28.14% over 2005 to VND1,243 billion.

- *Social and cultural activities:* (i) Education: Targeting at “standardization – modernization and socialization” as stated in the resolution of the communist party Term III of District 12. 2006, the education sector cooperated with universities of Pedagogy, Food Industry and other vocational centers and regular education schools for diversifying training modes in communal education centers at wards so as to improve people’s education; (ii) Training and job creation: jobs were introduced to 8,115 people, meeting 101.4% of the year’s plan. There were 27 cases of strikes, mostly because workers desired of higher salary. The district authorities also took part

in settling 30 claims by laborers, of which 26 cases are settled amicably and other 04 brought to courts. The capital mobilized in 2006 was VND302,185,000, of which the national budget covered 5%, i.e. VND150,000,000, and bank interests VND13,251,000. The total capital for loans to date is VND6,160,405,500 out of the total fund of VND7,044,991,416,. Loans were granted to 1,275 households, i.e. VND4,831,690 per households on average; (iii) Health care: Providing diagnoses and treatment for 493,778 people, meeting 123% of the 2006 target, of the total there were 6,259 out-patients, meeting 104% of the 2006 target, and 2,074 in-patients, meeting 52% of the year's plan. Free diagnoses and treatment were provided for 26,819 under-six children, of which 1,393 cases were in-patients. There were 8250 cases of emergency (of which 20% was work accidents and 23% traffic accidents), of which 4,025 were transferred to upper medical facilities, increasing by 50% over 2005; (iv) Culture-information and sports: The district sports center was inaugurated in May 2006. Phu Dong Games in the scholar year of 2005-2006 was organized at all 3 levels of educations with fair results. The district met 18% of the target of people frequently taking exercises. Local authorities cooperated with public organizations in sports games on occasion of holidays, and anniversaries of sectors, etc. which many people enthusiastically attended. Propaganda is continuously and frequently maintained for festive days. The newsletter of the district is continued and upgraded, disseminating economic, political and cultural contents and legal instruments to people.

c) Phu Nhuan district

Phu Nhuan District is one of 19 urban districts of Ho Chi Minh City. That is a small one with triangular shape. It borders:

- Binh Thanh district in the east,
- Tan Binh District in the west,
- Districts 1 and 3 in the south, and
- Go Vap district in the north.

Phu Nhuan District is located in the center of the old city with a total area of 4.88 km². It is divided into 15 wards.

Its population in 2005 was 175,716 people, equivalent to the density of 37,930 people/km². It is planned to reach 180,000 people in 2010 and 190,000 people in 2015 and to be stable at 200,000 people after 2020.

According to the orientations for economic growth of the district in 2007, the values of industries-handicrafts will increase by 9% and trade-service by 30% over 2006.

The total payment to the national budget was VND351.34 billion, soaring by 43.42% over the budgetary estimate for 2006. The total budgetary expenditure was VND 113.35 billion (not including the investment in development and upgrading), increasing by 6.6%. Jobs were introduced and provided for 5,500 people residing in the district. The hunger eradication and poverty alleviation fund was raised up to VND5.2 billion, and the rate of outstanding debts lowered to 5%. It is targeted that by the end of 2007, the rate of poor families will fall to 1.6%.

Phu Nhuan is a district with civil services as main functions. The economic structure of the district has been developed toward service-trading-industry and handicrafts. With respect to services, high-class ones such as financial and credit services, offices for lease, apartment, and tourist services have been strongly developed. The industries to be developed include clean and high-tech productions.

The planning of the district has been adjusted towards higher elevation and lower density, saving land for infrastructure with priority given to construction of high buildings for residence and services of various kinds by means of synchronous planning for both removal and construction and development of transport networks.

With respect to industrial entities, only high-tech industries will be developed at Ward 9, whereas a part of land of the existing industrial entities will be converted into land for public works, services or compartments in combination with service-providing zones.

Besides, the district will invest in construction of 15.5 ha of Gia Dinh park, vegetation covers along Nhieu Loc – Thi Nghe canal in zones 2,3 and 5. Green covers will be provided in the future multi-story buildings. Trees will be planted along roads and road-separators.

d) Binh Thanh district

Binh Thanh district covers 2076 ha with the population of 464397 people. The district is located in the northeast of Ho Chi Minh City, playing the role of a gate and a strategic area of the city. It border District 2 and Thu Duc district in the northeast, Binh Thanh and District 1 in the south over Thi Nghe arroyo, and Go Vap district and Phu Nhuan district in the west – northwest. Binh Thanh District is surrounded by the Saigon River in the northeast. Together with the Saigon River, canals and arroyos such as Thi Nghe, Cau Bong, Van Thanh, Thanh Da, Ho Tau and Thu Tac, etc. create a system of waterways that facilitate small boats to go to further inland zones of the district as well as to other areas.

In 2006 the performance of tasks with respect to economy, society, defense and security in District 10 was maintained and developed step by step. Under the concentrated steering of the District Party Committee, the management of the district PC, the attempt of organizations and sectors and people's zealous participation, emulation movements have been deployed effectively, particularly activities in honor of the 30th anniversary of Binh Thanh District (June 1976- June 2006) and therefore targets set forth by the People's Council of the district were met and exceeded.

- The production value of handicrafts and small industries increased by 22.6% (meeting 163% of the year's plan).
- Trading turnover soared by 26.6% (107% the year's plan).
- Total collection to the state budget in 2006 met 122,3% of the year's plan, increasing by 3.1% over 2005.
- Total budgetary expenditure in 2006 was 119.58% of the regulatory estimate, increasing by 2.94% over 2005.
- Jobs were provided for 15,120 people, 108.4% the year's plan.
- Collection of public interest contribution met 117.4 % of the year's plan.
- The rate of graduation from primary schools was 100% and that of junior high schools was 98.71%.

- The rate of under-5 malnutrition was 6.95%; the rate of children vaccinated as regulated met 100% of the year's plan.
- More than 60% residential blocks and 70% of groups met cultural standards, more than 95% grassroot entities met standards of civilization, beauty and security.

In general, the performance of socio-economic tasks in 2006 has been developed with the higher turnovers of manufacturing and trading when compared with 2005; urban administration took active changes, discipline in construction, house and land administration, traffic safety and discipline, etc. have been enhanced. There are many active changes in establishment of grassroot cultural living; the steering, administration and administrative reform of the government have attained many advancements, information technology has been effectively applied in state administration. Many public movements have been maintained and developed intensively, attracting numerous people.

d) Go Vap district

Go Vap district today is a region of 8 communes. After Saigon was named Ho Chi Minh City in July 1976, Go Vap became an urban district though urbanization was still low. The district is located on the northern belt of Ho Chi Minh City. About 1 km from the center of Ben Nghe (now District 1) in the northwest, it is a hillock land (11 m over the sea level) supplied with fresh water from the Ben Cat River, a tributary of the Saigon River, and therefore favorable for cultivation and living.

The year 2005 was important in the accomplishment of targets and 10 key works set forth in the resolution of the district communist party (2001-2005 term). It was also the year of many festive activities and congresses of the communist party at various levels. The stable socio-economic growth of the district continues with many active changes with many targets met or exceeded. (i) Industrial and handicraft development: Manual textile and garment has been developed in Go Vap many years ago with good name in all the south of Vietnam. Once villages of manual textile were symbols of Go Vap, Binh Thanh and Tan Binh. In Go Vap there were numerous workshops for leather tanning, sugar making, plank making and rice husking; (ii) Agriculture: Since 1990's and particularly after 1996, the change in crop structure has been very quick because rice is not efficient this land and people prefer intensive cultivation of vegetable (iii) Trade and service: With the open policy of the nation, a suburban region like Go Vap passed more than one decade of stagnation to stable development, 16% year on year, on average.

e) Thu Duc district

This is a suburban district in the northeast of Ho Chi Minh City. In 1997, the old Thu Duc district was divided into 3 new districts, namely District 2, District 9 and the current Thu Duc district under Decree 03/CP dated 06 January 1997 by the government. The new Thu Duc district covers 47.76 km², and the population of 400,000 people, including areas and populations of communes of Linh Dong, Linh Trung, Tam Binh, Tam Phu, Hiep Binh Phuoc, Hiep Binh Chanh, Thu Duc town, a part of communes of Hiep Phu, Tan Phu and Phuoc Long. After said division, communes were renamed wards. Thu Duc district has 12 wards with the same names as previous communes, i.e. Linh Dong, Linh Tay, Linh Chieu, Linh Trung, Linh Xuan, Hiep Binh Chanh, Hiep Binh Phuoc, Tam Phu, Truong Tho, Binh Chieu, Binh Tho, and Tam Binh.

Being a suburban district, Thu Duc had not many technical and social infrastructure facilities. All three streets across Thu Duc are national roads, namely Hanoi, 13 and outer beltway (the old Korean beltway). For many years, particularly after Thu Duc became an urban district, many roads were built or upgraded, and all wood bridges were replaced with concrete ones. New roads and bridges have linked hillock regions to remote areas, creating favorable conditions for the flow of goods, thereby fostering agriculture and industry to develop together.

2.3.2 Socio-economic conditions in the zones to be upgraded

a) Zones to be upgraded in District 9

Phuoc Long A ward was separated from the old Phuoc Long commune on 01 April 1997. It has the area of 273 ha and 4,151 households and 16,586 people, of which 7,748 are from other provinces (temporary residence, accounting for 46,75%). In the past, that was a semi-agriculture zone with gardens and rice fields. Affected by the high speed urbanization of the city, it became a destination for households from urban districts to rehabilitate. Therefore, houses there were built on landfill without administration. Internal roads and alleys are small and winding. Such a poor and insufficient infrastructure has been overloaded and flooding is worse day after day. Although local inhabitants and authorities have attempted to upgrade it with the formula of “the state and people share the expenditure”, of which people contribute 60% percent and the state covers the counterbalance, roads in the ward are still poor with 30% not covered with concrete.

In the process of urbanization, Phuoc Long A has shifted from tradition agriculture to urban agriculture, which is concentrated in decorative trees and golden fish so as to take full use of land and local unemployed laborers.

Statistic data related to living standards of the ward indicate that 20% households are rich, 50% moderate, 20% medium and 10% poor.

General remarks: In the past District 9 was a part of Thu Duc, a semi-agriculture district and therefore the current infrastructure is poor with many narrow alleys not covered with concrete. Particularly, drainage and clean water are not sufficient. Many local inhabitants have changed from farmers to hired workers, petty traders, or workers. Many households are the poor moved from slums of Ho Chi Minh City. As such, the zone of Phuoc Long A ward, District 9 should be included in the urban upgrading project.

b) Zones to be upgraded in District 12

The zones to be upgraded in District 12 include 3 wards, namely Thanh Loc, Tan Thoi Nhat and Dong Hung Thuan. Thanh Loc and Tan Thoi Nhat have characteristics of suburban areas being urbanized with a major part of inhabitant living on petty trading along Ha Huy Giap road and National Road 1A. Poor households which reside far from main roads are living on hired simple. About 20% of farming households earn their living on cultivation of jasmine and decorative plants.

Dong Hung Thuan ward is rather large and the speed of urbanization is high with the increasing inflow of people from other localities. Aquaculture is shrinking and people have shifted to handicrafts, petty trading and services, and hired works. Many households near main road earn their living on trading and handicrafts, whilst households in alleys

live on making hats, coffins, breeding and cultivation of vegetable. There are some regions where 60% of inhabitants are from other provinces, they live on various jobs such as workers, taxi driver, bricklayer or petty trader.

Statistic data related to living standards of the ward indicate that 7% households are rich, 17.5% moderate, 50% medium and 25.5% poor.

General remarks: The characteristics of LIAs in District 12 include the poverty of a majority of inhabitants with unstable income, poor infrastructure, lacking of drainage, shortage of clean water, and narrow roads without concrete surface, etc. Therefore, this should be included in the urban upgrading project.

c) The zones to be upgraded in Phu Nhuan district

Phu Nhuan district has 5 zones to be upgraded in 3 wards, namely 7, 8 and 17. In those zones, most alleys are 2 to 4m wide, covered with concrete yet many alleys are downgraded. The systems such as electrical network and water supply are almost complete. Ward 7 is the ward next to Nhieu Loc - Thi Nghe canal. High water together with a large flow of rainwater pouring the canal (from the region of Phan Xich Long road and Huynh Van Cung road) has overloaded the existing drainage in the zone, causing flooding and inundation.

Alleys in Ward 17 are small and winding. Most of them are covered with concrete and equipped with electrical network, water supply, and drainage. The alleys in the zones to be upgraded are very small, less than 2 m wide, or even less than 1 m. It is noteworthy that in the zone to be upgrading in Ward 17 there is a community of Cham people who live intimately with a big mosque and a small mosque. Households of Cham people are characterized by the living of 2-3 generations together in very small houses, for instance, more than 10 people lives in a house of approximately 40m². The main jobs are hired work and petty trading. Cham people earn their living on petty trading and breeding.

In Wards 7 and 8, except of few households of state employees, a major part of people live on hired work, trading and petty trading. In general, their income is stable with many households classified as moderate and medium. There is no jobless household.

Statistic data related to living standards of the site indicate that most of Vietnamese households are moderate and medium, while many Cham households are poor with too many children.

General remarks: In the zones to be upgraded in Phu Nhuan district, though they are located in the center of Ho Chi Minh City, flooding and inundation due to flooding tide and rain water have caused pollution and living difficulties to local inhabitants. Particularly in Ward 17, a major part of Cham people is very poor and one of their utmost desire is wider alleys. Therefore, upgrading of infrastructure is essential for improving people's living conditions.

d) The zones to be upgraded in Binh Thanh district

Three 3 zones to be upgraded in the district are populated LIAs with poor infrastructure, low and small houses and narrow alleys. Flooding and inundation is frequent because the overloaded and downloaded drainage is unable to discharge water during flooding tide

from Nhieu Loc - Thi Nghe canal together with rain water. The flooding and inundation in those zones are worse because some sections of sewers are filled up for building houses or by refuse.

In the region of Ward 2 there is Ba Chieu market, one of big markets of Ho Chi Minh City. It attracts a large number of laborers, creating many jobs for local people. Living near the market, many people earn their living on simple labor, petty trading. Only few households which have houses open to main streets have shops. A minor part of people is public employees and retired cadres.

Statistic data related to living standards of the wards are as follows: in Ward 2, 5% are rich, 30% moderate, 57% medium and 8% poor; Ward 15: 5% rich, 30% moderate, 50% medium and 15% poor.

General remarks: Although Wards 2 and 15 are located in the center of the district, their living environment is still poor with heavy pollution due to frequent inundation as a result of high water, alleys are narrow. Many people are poor, and many children must quit schools for daily bread. People really want alleys to be expanded for more convenient traffic and roads to be upgraded for better hygiene.

d) The zones to be upgraded in Go Vap district

In the past, Go Vap a semi-agriculture district with most land for cultivation of vegetable and flowers. Affected by the high speed urbanization of the city, houses there were built on divided agricultural land without administration. Ward 5 is the destination for many people from other provinces. The poor and insufficient infrastructure has been overloaded and flooding is worse day after day. Ward 15 is the place where many catholic people concentrate. In the zone to be upgraded there is Tu Dinh parish. In general, people there are poor with jobs for living such as hired work, petty trading, cultivation of vegetable or decorative trees, breeding and guest-rooms for rental.

Statistic data related to living standards of the ward indicate that 5% households are rich, 15% moderate, 50% medium and 30% poor.

General remark: Having been urbanized, the zones included in the urban upgrading project still have poor infrastructure with alleys of rammed rubble, shortage of clean water, particularly, in Ward 5 all households are poor and they live without any drainage system. In general, in those zones many households are poor with very poor living conditions, particularly people from other provinces.

e) The zones to be upgraded in Thu Duc district

Thu Duc district has 2 wards in the project, those include Linh Tay (2 zones) and Linh Chieu (1 zone). The 3 zones are in 5 residential blocks of 16 groups. The infrastructure facilities in the zones to be upgraded are not good, for instance, Linh Chieu ward has 43 small alley not covered with concrete, some sections have no connection of drainage, and 20% of houses (in 21 alleys) are not accessible to clean water although the ward is adjacent to Thu Duc waterworks. In 2006, 253 households have the per capital income of less than VND6 million per year, accounting for 8.08% of the total households. 90% of households have registered to empty garbage as regulated but matters of environmental hygiene are basically not settled with litter still on roads. Household in those zones are

mostly living on petty trading and hired works, except for some state employees and some others manufacturing threads for making bicycle tires.

Statistic data related to living standards of the ward indicate that no household is rich, 10% moderate, 50% medium and 40% poor.

General remarks: Although Linh Tay and Linh Chieu are parts of the center of Thu Duc district, their infrastructure facilities are inadequate and many households are still poor. In many regions, drainage is unavailable or downgraded. Many households are not accessible to clean water though the zones are adjacent to Thu Duc waterworks. Therefore, those zones should be included in the urban upgrading project.

2.3.3 Scope of the zones to be upgraded

The scopes of the zones to be upgraded in districts are tabulated in Table 2.4.

Table 2.4 – Scope of the zones to be upgraded

| District | Ward | Zones | Blocks | Groups | Households | Beneficiary households | Socio-economic investment forms |
|---------------|-----------------|-----------|-----------|------------|------------|------------------------|---------------------------------|
| District 9 | Phuoc Long A | 1 | 1 | 13 | 799 | 635 | 115 |
| District 12 | Dong Hung Thuan | 6 | 6 | 56 | 1413 | 684 | 331 |
| | Thanh Loc | 1 | 1 | 4 | 398 | 111 | 64 |
| | Tan Thoi Nhat | 2 | 3 | 33 | 1823 | 945 | 124 |
| Phu Nhuan | Ward 7 | 3 | 3 | 19 | - | 770 | 232 |
| | Ward 8 | 1 | 1 | 5 | - | 187 | 36 |
| | Ward 17 | 1 | 2 | 6 | 463 | 224 | 50 |
| Binh Thanh | Ward 2 | 2 | 2 | 3 | - | 106 | 54 |
| | Ward 15 | 1 | 1 | 6 | 957 | 280 | 135 |
| Go Vap | Ward 5 | 1 | 3 | 18 | 3490 | 610 | 357 |
| | Ward 15 | 1 | 1 | 6 | 948 | 163 | 86 |
| | Ward 12 | 1 | 1 | 6 | 1773 | 188 | 60 |
| Thu Duc | Linh Chieu | 1 | 1 | 6 | 274 | 161 | 96 |
| | Linh Tay | 2 | 4 | 10 | 198 | 67 | 48 |
| Total: | | 24 | 30 | 181 | - | 5131 | |

Source: Saigon Water, Environment and Infrastructure Company, December 2006.

2.3.4 Gender, family size and household income

a) Gender and family size

The investigation was carried with the participation of 638 households of 3140 members, of which male accounted for 48.8 % and female 51.2%. Pertaining to family size, small ones are dominant, in details, households of 1-2 members accounted for 8.6%, those of 3-4 members 51.6%. The rate of households with 5-6 members is high (22.5%). Usually

they are the households in which 2 to 3 generations live together. It is noteworthy that 13% of households have 7-9 members and 6.7% with 10-16 members. They should be given special attention in the programs for improving living and housing conditions.

b) Household income

The investigation found the per capita income of households at VND755,000 per month. On average, a household monthly spends VND3,093,000 and that of an individual is VND627,500. Investigation data in each district are given below:

Table 2.5 – Statistic results of household income

| No. | District | Average of total income (VN/month) | Per capita income (VND/month) |
|-----|---------------------|---------------------------------------|----------------------------------|
| 01 | District 9 | 3.674.000 | 734.800 |
| 02 | District 12 | 3.455.000 | 610.000 |
| 03 | Phu Nhuan district | 4.267.000 | 853.400 |
| 04 | Binh Thanh district | 3.999.000 | 799.800 |
| 05 | Go Vap district | 4.180.000 | 836.000 |
| 06 | Thu Duc district | 3.674.000 | 734.800 |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

2.3.5 Education levels and jobs

a) Education levels

Results from the investigation of 2,825 people in term of education levels are as follows:

- Illiterate or re-illiterate : 0.8%
- grade 1 (class 5) incomplete : 5.7%
- grade 1 complete : 17.8%
- grade 2 (classes 6-9) complete : 30.76%
- grade 3 (classes 10 - 12) complete : 25.7%
- Vocational training complete : 4.2%
- College and university : 14.2%
- Post-graduate : 0.8%

b) Job structure

Current jobs: The investigation of 1455 people in term of current jobs returned results as follows:

- State employee : 138 people (9.48%)
- Policeman, soldier : 14 people (0.96%)
- Physician, engineer, teacher : 137 people (9.42%)
- Trader : 161 people (11.06%)
- Handicraftsman : 50 people (3.44%)
- Service provider : 91 people (6.25%)
- Hired laborer : 238 people (16.36%)
- Pensioner : 49 people (3.37%)
- Others : 232 people (15.59%)

It is noteworthy that among the jobs mentioned above, hired laborers account for the highest percentage (16.36%) and they should receive special attention because their income is not stable and unemployment is easy to occur to them.

2.3.6 Housing state

a) House classification

The investigation of the actuality of houses in the LIAs in the project found various kinds of houses, from solid, semi-solid, wooden-frame, palm-roof houses to temporary lodgings, which interposed with each other but the major part is semi-solid houses. The largest percentage of solid houses is found in Binh Thanh district, 42.25% and the lowest in Thu Duc, 14.64%. The largest percentage of semi-solid houses is found in Thu Duc district (78.03%).

Table 2.6– Classification of houses in the zones to be upgraded

| District | Ward | House classification | | | | | Sub-total % |
|--------------------------------|-----------------|----------------------|--------------|--------------|-------------|--------------|-------------|
| | | Solid % | Semi-solid % | Wood-frame % | Palm-roof % | Others % | |
| District 9 | Phuoc Long A | 32.35 | 42.65 | 2.94 | 0 | 22.06 | 100 |
| TC. District 9 | | 32.35 | 42.65 | 2.94 | 0 | 22.06 | 100 |
| District 12 | Dong Hung Thuan | 26.38 | 68.71 | 1.23 | 3.68 | 0 | 100 |
| | Thanh Loc | 25 | 60 | 5 | 10 | 0 | 100 |
| | Tan Thoi Nhat | 20.51 | 74.36 | 1.28 | 3.84 | 0 | 100 |
| TC. District 12 | | 23.96 | 67.69 | 2.5 | 5.84 | 0 | 100 |
| Phu Nhuan district | Ward 7 | 36.54 | 61.54 | 0 | 0 | 1.92 | 100 |
| | Ward 8 | 11.11 | 66.66 | 5.55 | 5.55 | 11.11 | 100 |
| | Ward 17 | 33.33 | 53.33 | 3.33 | 10 | 0 | 100 |
| TC. Phu Nhuan district | | 26.99 | 60.51 | 2.96 | 5.18 | 4.34 | 100 |
| Binh Thanh district | Ward 2 | 47.83 | 34.78 | 4.35 | 0 | 13.04 | 100 |
| | Ward 15 | 36.66 | 60 | 3.33 | 0 | 0 | 100 |
| TC. Binh Thanh district | | 42.25 | | | 0 | | 100 |
| Go Vap district | Ward 5 | 16.66 | 75.76 | 3.03 | 3.03 | 1.51 | 100 |
| | Ward 12 | 40 | 40 | 3.33 | 6.66 | 10 | 100 |
| | Ward 15 | 5 | 85 | 5 | 0 | 5 | 100 |
| TC. Go Vap district | | 20.55 | 62.92 | 3.79 | 3.23 | 5.5 | 100 |
| Thu Duc district | Linh Tay | 18.18 | 72.73 | 0 | 0 | 9.09 | 100 |
| | Linh Chieu | 11.11 | 83.33 | 0 | 5.55 | 0 | 100 |
| TC. Thu Duc district | | 14.64 | 78.03 | 0 | 2.78 | 4.55 | 100 |
| Total | | 25.76 | 62.78 | 2.74 | 3.45 | 5.27 | 100 |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

b) Average of housing area

Average of housing area is a parameter which applies to LIAs. The investigation found it 67.36 m²/house. But the real housing areas are not even. In Binh Thanh and Phu Nhuan there are many houses smaller than 30m² though the family sizes thereof may be as large as 7 to 8 people as seen in the community of Cham people at Ward 7, Phu Nhuan district. Such a limited area is the reason to explain why they do not want to expand alleys too much, i.e. at most 2 m because said expansion will further narrow their housing areas.

Table 2.7 – Average of housing area in the zones to be upgraded

| No. | District | Average of house area (m ² /house) | Average of housing area (m ² /people) |
|-------------|-------------|---|--|
| 01 | District 9 | 79.28 | 15.85 |
| 02 | District 12 | 57.77 | 11.72 |
| 03 | Phu Nhuan | 47.02 | 10.45 |
| 04 | Binh Thanh | 78.48 | 15.70 |
| 05 | Go Vap | 63.30 | 13.18 |
| 06 | Thu Duc | 78.29 | 15.86 |
| Mean | | 67.36 m²/ house | 13.76 m²/ people |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

2.3.7 State of alleys

Most alleys in the LIAs are as narrow as 3m with many sections less than 2.5m and 2m in width. Alleys in LIAs are covered with bitumen concrete or concrete, or with pebble or still pathways. The rate of bitumen concrete alleys is 10.3% (mostly in Phu Nhuan district), concrete alleys 41.1% (mostly in Phu Nhuan and Binh Thanh), pebble alleys 12.7% (mostly in District 12), and pathways 35.6% (mostly in District 12 and Thu Duc).

2.3.8 State of water supply and drainage

a) State of flooding and inundation

The state of flooding and inundation as shown by the percentage of affected households in the project site according to the investigation is shown in Table 2.8.

Table 2.8 –State of flooding and inundation in the zones to be upgraded

| Is access route to house inundated? | | District | | | | | Total | |
|-------------------------------------|-----------|------------|-------------|--------------------|---------------------|-----------------|---------|------------------|
| | | District 9 | District 12 | Phu Nhuan district | Binh Thanh district | Go Vap district | | Thu Duc district |
| Yes | household | 46 | 134 | 34 | 22 | 94 | 29 | 359 |
| | % | 67.60% | 51.30% | 34.00% | 41.50% | 81.00% | 72.50% | 56.30% |
| No | household | 22 | 127 | 66 | 31 | 22 | 11 | 279 |
| | % | 43.70% | 66.00% | 58.50% | 19.00% | 27.50% | 32.40% | |
| Total | Household | 68 | 261 | 100 | 53 | 116 | 40 | 638 |
| | % | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

As seen in the table, flooding and inundation occur at most zones in the project site with the worst in Go Vap district (81% of investigated households) and the least severe in Phu

Nhuan district (34% of investigated households). Causes of inundation include heavy rain and flooding tide in the zones where sewers are unavailable or frequently choked, etc.

b) State of water supply

Without supply of clean water (tap water), a major part of households in LIAs must use water from tube wells, the quality of which are dependent much on drilling technique and health may be damaged if underground water fails to meet standards.

c) State of family drainage

The investigation of the drainage in LIAs found 45.8% of households have connections from their houses to common sewers with the highest rate recorded in urban districts such as Phu Nhuan (75%) and Binh Thanh (60.4%); in District 9 the rate is as low as 8.8%. Only 39% of households in the LIAs have tanks for storing wastewater before discharge. The highest rate is found in District 9, 63.2%. That means in Phuoc Long A ward, common sewers are limited or too far from LIAs then connections become unaffordable. The investigation also found that in District 9 and Thu Duc, the self-adsorption method is prevalingly used.

Table 2.9 – State of family drainage in the zones to be upgraded

| District | Ward | Septic tank | | Connection to sewer | | Self-absorption | | Other means | | Total | |
|--------------------------------|-----------------|-------------|--------------|---------------------|--------------|-----------------|--------------|-------------|-------------|------------|------------|
| | | Household | % | Household | % | Household | % | Household | % | Household | % |
| | Phuoc Long A | 43 | 63.24 | 6 | 8.82 | 19 | 27.94 | 0 | 0 | 68 | 100 |
| TC. District 9 | | 43 | 63.24 | 6 | 8.82 | 19 | 27.94 | 0 | 0 | 68 | 100 |
| | Dong Hung Thuan | 69 | 42.33 | 66 | 40.5 | 21 | 12.88 | 7 | 4.29 | 163 | 100 |
| | Thanh Loc | 5 | 25 | 13 | 65 | 2 | 10 | 0 | 0 | 20 | 100 |
| | Tan Thoi Nhat | 35 | 44.87 | 27 | 34.62 | 16 | 20.51 | 0 | 0 | 78 | 100 |
| TC. District 12 | | 109 | 41.76 | 106 | 40.61 | 39 | 14.94 | 7 | 2.68 | 261 | 100 |
| | Ward 7 | 12 | 23.08 | 39 | 75 | 1 | 1.92 | 0 | 0 | 52 | 100 |
| | Ward 8 | 6 | 33.33 | 12 | 66.67 | 0 | 0 | 0 | 0 | 18 | 100 |
| | Ward 17 | 6 | 20 | 24 | 80 | 0 | 0 | 0 | 0 | 30 | 100 |
| TC. Phu Nhuan district | | 24 | 24 | 75 | 75 | 1 | 1 | 0 | 0 | 100 | 100 |
| | Ward 2 | 7 | 30.43 | 16 | 69.57 | 0 | 0 | 0 | 0 | 23 | 100 |
| | Ward 15 | 7 | 23.33 | 16 | 53.33 | 7 | 23.33 | 0 | 0 | 30 | 100 |
| TC. Binh Thanh district | | 14 | 26.41 | 32 | 60.38 | 7 | 13.21 | 0 | 0 | 53 | 100 |
| | Ward 5 | 28 | 42.42 | 32 | 48.49 | 4 | 6.06 | 2 | 3.03 | 66 | 100 |
| | Ward 12 | 15 | 50 | 12 | 40 | 2 | 6.67 | 1 | 3.33 | 30 | 100 |

| District | Ward | Septic tank | | Connection to sewer | | Self-absorption | | Other means | | Total | |
|-----------------------------|------------|-------------|--------------|---------------------|--------------|-----------------|--------------|-------------|-------------|------------|------------|
| | | Household | % | Household | % | Household | % | Household | % | Household | % |
| | Ward 15 | 0 | 0 | 16 | 80 | 0 | 0 | 4 | 20 | 20 | 100 |
| TC. Q. Go Vap | | 43 | 37.07 | 60 | 51.72 | 6 | 5.17 | 7 | 6.04 | 116 | 100 |
| | Linh Tay | 11 | 50 | 5 | 22.73 | 6 | 27.27 | 0 | 0 | 22 | 100 |
| | Linh Chieu | 5 | 27.78 | 8 | 44.44 | 5 | 27.78 | 0 | 0 | 18 | 100 |
| TC. Thu Duc district | | 16 | 40 | 13 | 32.5 | 11 | 27.5 | 0 | 0 | 40 | 100 |
| Total | | 249 | 39.03 | 292 | 45.77 | 83 | 13.01 | 14 | 2.19 | 638 | 100 |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

d) State of canals (level 1)

Inside or around the zones to be upgraded in the project there are some small canals in District 12, Go Vap, and Binh Thanh. In fact they are small branches of two level-1 canals, namely Nhieu Loc - Thi Nghe and Tham Luong - Ben Cat - Vam Thuat.

Nhieu Loc - Thi Nghe canal: this has the basin of 3,000 ha, a main canal of 9,470m in length, and branches of 8,716m, including arroyos of Cong Ba Xep (300m), Bung Binh (652m), Mieu (1.116m), Ong Tieu (740m), Mieu Noi (640m), Bui Huu Nghia (620m), Cau Son (960m), Phan Van Han (1.020m), and Van Thanh (1.465m). This system also has 52 discharge gates.

Tham Luong – Ben Cat – Vam Thuat canal: this has the basin of 9,000 ha, a main canal of 14,080m, and branches of 5.360m, including arroyos of Dua, Bang, Lang, Ben Cat, Ong Tong, Dinh An Nhon, Ba Mieu, Cau Mot, Rong Voi, and Sen.

Since the slopes of those canals are very low and their bottoms have been filled up with dregs of urban effluent and refuse from households, their ability of drainage is very low. Special features of canals in Ho Chi Minh City include strong influence of tide and various flow directions. As a result, pollutants are easy to accumulate in canals, and with increasingly higher concentrations of pollutants, canals are causative of poor landscape, particularly in the center of the city, and more importantly, of negative impacts on people's health.

2.3.9 State of electrical network and public lighting

a) Electrical network

According to the investigation of the whole project site, 98.6% families are accessible to electrical network via separate power meters, whilst 0.2% households have no electricity. It is estimated that 1.2% of the investigated households must share power meters with neighbors.

b) Public lighting

More than 95% of LIAs have no public lighting system that meets standards. Most of those systems are built by local people.

Table 2.10 – Sources of electricity at LIAs

| No. | District | Source of electricity | | |
|---------------|-------------|-----------------------|--------------|-------------|
| | | Separate meter | Shared meter | No |
| 01 | District 9 | 97.7% | 1.9% | 0.4% |
| 02 | District 12 | 99.0% | 1.0% | 0% |
| 03 | Phu Nhuan | 100.0% | 0% | 0% |
| 04 | Binh Thanh | 98.3% | 1.7% | 0% |
| 05 | Go Vap | 100.0% | 0% | 0% |
| 06 | Thu Duc | 100.0% | 0% | 0% |
| Total: | | 98.6% | 1.0% | 0.4% |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

2.3.10 State of fire prevention

Almost all LIAs in the project site have no fire system. Worse still, due to very narrow alleys, fire trucks can never access those LIAs in case of fire. All LIAs have no fire roadside hydrant. Furthermore, people are not aware of the severity of fire and in fact they income is so limited as to cover only everyday demand, they never think about use of family-use fire extinguishers. Besides, most of houses are made of flammable materials such as wood and palm, etc. Without any means for fighting fire, the risk of fire is extremely high. Usually, a fire at a LIA causes loss of low-value assets but its scope is may be as large as hundreds of households. That is a matter of attention in implementation of the urban upgrading project.

2.3.11 Community health

The investigation in term of community health pointed out common diseases in LIAs, those include influenza and diarrhea and particularly respiratory diseases. That may be related to the living conditions, for instance dank houses, smoke pollution, refuse, etc.

Table 2.11 – Summarization of results from the investigation of the state of infrastructure in the zones to be upgraded

| | District 9 | District 12 | Phu Nhuan district | Binh Thanh district | Go Vap district | Thu Duc district |
|-----------------------------------|--|---|--|--|--|--|
| 1. State of alleys | <ul style="list-style-type: none"> - Zones to be upgraded have 35 alleys. - Winding alleys. - 60-70 % covered with concrete (by local inhabitants) and 30-40% pathways. | <ul style="list-style-type: none"> - Alleys not completely built - A major part being pathways of 1.8 to 7m in width. | <ul style="list-style-type: none"> - Winding alleys - Most alleys being 2 to 4m wide; - Most alleys covered with concrete but downgraded. | <ul style="list-style-type: none"> - Very narrow alleys, 1.6m to 4m. - Many alleys downgraded. | <ul style="list-style-type: none"> - Alleys not fully built due to inadequate investment. - More than 120 alleys of 1.4 to 6.5m in width | <ul style="list-style-type: none"> A major part being pathways, some alleys covered with concrete but downgraded. |
| 2. Flooding and inundation | Frequently | Frequently in flooding tide | Long lasting inundation | Frequently | Frequently in flooding tide and heavy rain | Frequently in heavy rain |
| 3. Drainage | No drainage | <ul style="list-style-type: none"> - Drainage failing the meet demand - Some zone having no drainage yet | <ul style="list-style-type: none"> - Many sewers damaged. - Main sewers too small and therefore overloaded. | Drainage being overloaded and downgraded badly. | No drainage in the zones to be upgraded | Sewers at large alleys failing to meet demand |
| 4. Clean water supply | <ul style="list-style-type: none"> - Clean water system available - Lacking of fire hydrants | <ul style="list-style-type: none"> - Clean water supply not available - 90% households using tube well water that fail to meet standard | Sufficient water supply system | Sufficient water supply system | <ul style="list-style-type: none"> - - Clean water supply not available - 90% households using tube well water that fail to | Sufficient water supply system |

| | District 9 | District 12 | Phu Nhuan district | Binh Thanh district | Go Vap district | Thu Duc district |
|---|---|---|---|---|---|---|
| | | | | | meet standard | |
| 5. Electrical network for living | - Relatively good electrical network. - Old poles failing to meet standards on overhead height and safety in case of rain and storm. | - Relatively good electrical network. - Old poles failing to meet standards on overhead height and safety in case of rain and storm. | - Relatively good electrical network. - Old poles failing to meet standards on overhead height and safety in case of rain and storm. | - Relatively good electrical network. - Poles failing to meet standards on overhead height and safety in case of rain and storm. | - Relatively good electrical network. - Old poles failing to meet standards on overhead height and safety in case of rain and storm. | - Relatively good electrical network. - Failing to meet standards on overhead height and safety in case of rain and storm. |
| 6. Public lighting | Lacking of public lighting. | Lacking of public lighting. | - Public lighting built by local people, failing to meet standard. | - Public lighting built by local people, failing to meet standard. | - Public lighting built by local people, failing to meet standard. | - Public lighting built by local people, failing to meet standard. |

Source: Saigon Water, Environment and Infrastructure Company, December 2006

CHAPTER 3

ASSESSMENT OF THE ENVIRONMENTAL IMPACTS DUE TO ACTIVITIES
OF THE PROJECT

3.1 OVERVIEW OF IMPACTS DUE TO THE PROJECT

3.1.1 Summary of main items of the project

EIA means assessment of both positive and negative impacts, and indirect impacts of the project. Impacts are assessed with respect to their potentials, severity and affecting scope; The impacts of the project in two phases, construction and operation, will be pondered and assessed.

The project TV2_TP2 includes 3 main items, namely upgrading of water supply, drainage and alleys (together with public lighting) in 6 districts with the quantity as shown in *Table 3.1*.

Table 3.1 – Quantity of main work items of Bidding Package TV2_TP2.

| No. | Main work item | Unit | Quantity |
|-----------|--------------------------------------|----------------|------------|
| I | Alleys | | |
| 1 | - Bitumen concrete main alley | m ² | 8,136.20 |
| 2 | - Concrete main alley | m ² | 78,531.50 |
| 3 | - Concrete sub-alley | m ² | 100,771.46 |
| 4 | - Digging of basement | m ³ | 25,437.75 |
| 5 | - Building of basement | m ³ | 16,789.50 |
| 6 | - Reinforcement of basement | m ³ | 58,464.74 |
| 7 | - Building of partition walls | m ³ | 22,260.02 |
| II | Drainage | | - |
| 1 | - P 300 | M | 7,841.00 |
| 2 | - P 400 | M | 29,007.00 |
| 3 | - P 600 | M | 5,004.00 |
| 4 | - P 800 | M | 1,372.00 |
| 5 | - P 1000 | M | 249.00 |
| 6 | - Ditch 300x400 | M | 307.00 |
| 7 | - Ditch 400x400 | M | 559.00 |
| 8 | - Soakage pit of culvert P 400 | Nos. | 2,125.00 |
| 9 | - Soakage pit of culvert P 600 | Nos. | 311.00 |
| 10 | - Soakage pit of culvert P 800 | Nos. | 65.00 |
| 11 | - Soakage pit of culvert P 1000 | Nos. | 11.00 |
| 12 | - Soakage pit for sub-alley >6m | Nos. | 81.00 |
| 13 | - Soakage pit for sub-alley >4,5m<6m | Nos. | 1,471.00 |
| 14 | - Soakage pit ditch 300x400 | Nos. | 28.00 |
| 15 | - Soakage pit ditch 400x400 | Nos. | 40.00 |
| 16 | - Manhole 400 | Nos. | 10.00 |
| 17 | - Manhole 600 | Nos. | 8.00 |
| 18 | - Manhole 800 | Nos. | 9.00 |
| 19 | - Manhole 1000 | Nos. | 3.00 |

| No. | Main work item | Unit | Quantity |
|------------|--|------------|---------------|
| 20 | - Driving of cajuput stakes | M | 1,937,488.68 |
| III | Water supply | | - |
| 1 | - P 50 | M | 123.00 |
| 2 | - P 100 | M | 22,724.00 |
| 3 | - P 150 | M | 12,797.00 |
| 4 | - P 200 | M | 654.00 |
| 5 | - Installation of water meter | No. | 7,495.00 |
| IV | Fire hydrant | Set | 142.00 |
| V | Public lighting | | - |
| 1 | - New electricity poles | Pole | 806.00 |
| 2 | - Brackets and lamps for public lighting | Set | 1,351.00 |
| 3 | - Public lighting wire | M | 29,840.80 |
| 4 | - Control panel | Set | 49.00 |
| 5 | - Accessory | | - |

3.1.2 Overview of environmental impacts of the project

The impacts to be pondered and assessed include direct positive and negative ones as well as other indirect influences. The possibility of the events that may occur will be evaluated first, then the significance and affecting scope of impacts; and third the possibility of limiting negative impacts. Impacts may be pondered in two types related to the construction and operation phases. Based on severity, affecting scope with characteristics of the project taken into account, negative impacts will be rated with three levels as follows:

- i) **Medium negative impact.** A negative impact is considered medium if it occurs yet fails to meet parameters of a considerable impact.
- ii) **Significant negative impact:** this is an impact with strong influences on the environment (natural or social). The following parameters are used in determine whether an impact is significant.
 - (a) Space (location, locality, region, nation, inter-nation);
 - (b) Lasting period (short, medium or long);
 - (c) Influence of changes due to activities of the project (small, medium or large);
 - (d) Importance to local people;
 - (e) Abidance by with laws, regulations or national standard;
 - (f) Compliance with international conventions to which Vietnam is a party, and
 - (g) Reference to policies, regulations and instructions of the World Bank
- iii) **Severe negative impact:** this is the impact with **strong influence** and a larger scope of influence on environmental components in terms of space, duration with reference to the Constitution.

Positive impacts are rated with the same levels but the evaluation is based on benefit, people's satisfaction and friendliness to the environment.

Through work items shown in Table 3.1, the construction activities of the project will certainly causes impacts on the environment as well as living conditions of local people. An overview of impacts of activities of the project is shown in Table 3.2.

Table 3.2 – Overview of impacts

| Impact | Type | Level |
|--|--------------------|--------------|
| I. Pre-construction phase | | |
| 1.1 Impact on living quality of people due to preparation for the project, removal and site clearance. | Negative | High |
| 1.2 Impacts on air quality due to site clearance. | Negative | Medium |
| II. Construction phase | | |
| 2.1 Emission of dust: from transport, construction and dust from construction sites | Negative | High |
| 2.2 Production of noise: from transport vehicles, machines and workers in construction sites | Negative | Medium |
| 2.3 Air pollution from emissions of vehicles and construction machines | Negative | Medium |
| 2.4 Wastewater from sites under construction | Negative | Medium |
| 2.5 Traffic obstruction since roads are used as construction sites | Negative | High |
| 2.6 Offensive smells and sanitation matters at construction sites. | Negative | Medium |
| 2.7 Damages of roads | Negative | Medium |
| 2.8 Damages to existing works | Negative | Medium |
| 2.9 Leakage and spillage of oil/hazardous wastes to the project site | Negative | Medium |
| 2.10 Impact on living of local inhabitants | Negative | High |
| 2.11 Work accidents and incidents during construction | Negative | Medium |
| III. Operation phase | | |
| 3.1 Solid wastes at drainage discharge gates | Indirect /Negative | Medium |
| 3.2 Increase in traffic density in alleys | Indirect /Negative | Medium |
| 3.3 Quality of water supply | Direct /Positive | High |
| 3.4 Local inundation | Direct /Positive | High |
| 3.5 Land use value /development of alternatives | Direct /Positive | High |

3.2 IMPACTS IN THE PRE-CONSTRUCTION PHASE

3.2.1 Impacts on people living quality

In the phase of designing, some activities such as investigation and counsel for preparing the investment project affect people's living quality more or less because of the concern for site clearance and removal. This impact is not severe though it impacts the living of local people.

In the post-design phase, removal and site clearance affect people's living as follows:

- Removal and site clearance is one of the biggest impacts on people's living quality in the affected areas, particularly on people whose land and/or houses are fully given to the project. Since the project targets to LIAs (slums), this impact is partially lessened by the benefit that the project will bring in when it is accomplished.

- Site clearance is very complicated and causative of strong impacts on the socio-economic environment in the project site. Statistic data of land and houses to be affected by the project are shown in Table 3.2.
- Compensation and site clearance for construction at first cause direct impacts on people in the affected areas. A major part of households in the alleys to be upgraded will have to remove parts of construction works (yards, houses, subordinate works, etc.). Fortunately, in fact households have yards of 1 to 3 m in length and therefore structures of house will not be damaged. Nevertheless, removal will disturb their living activities.
- The households which have no connections to common water supply and drainage systems and those which have restrooms on canals will suffer significant inconvenience during the construction.

Table 3.2 – Statistic data of houses and land to be affected by the project

| No. | CODE | ZONE TO BE UPGRADED | AFFECTED HOUSES | | | AFFECTED HOUSING LAND | | |
|-----|--------|---|-----------------|---------|-------|-----------------------|---------|-------|
| | | | IN PART | IN FULL | TOTAL | IN PART | IN FULL | TOTAL |
| 1 | 09. 02 | Xom Trung in Block 2 | 482 | | 482 | 2.996 | | 2.996 |
| 2 | 12. 01 | Block 1 and Block 7 | 198 | | 198 | 1.561 | | 1.561 |
| 3 | 12. 02 | Block 2 | 52 | | 52 | 706 | | 706 |
| 4 | 12. 04 | Block 1 | 12 | | 12 | 122 | | 122 |
| 5 | 12. 04 | Block 2 | 219 | | 219 | 1.374 | | 1.374 |
| 6 | 12. 05 | Block 3 | 321 | | 321 | 1.900 | | 1.900 |
| 7 | 12. 06 | Block 4 | 63 | | 63 | 556 | | 556 |
| 8 | 12. 07 | Block 5 | 68 | | 68 | 608 | | 608 |
| 9 | 12. 08 | Block 6 | 98 | | 98 | 594 | | 594 |
| 10 | 12. 09 | Ga crossroads | 139 | | 139 | 853 | | 853 |
| 11 | BT. 02 | Alleys 280/110 & 280/120 Bui Huu Nghia | 40 | | 40 | 39 | | 39 |
| 12 | BT. 07 | Alley 350 Bui Huu Nghia | 24 | | 24 | 49 | | 49 |
| 13 | BT. 05 | Sub-alleys of alley 27 Dien Bien Phu in Blocks 1 & 2 | 49 | | 49 | 63 | | 63 |
| 14 | GV. 02 | Blocks 7, 9 | 554 | | 554 | 4.571 | | 4.571 |
| 15 | GV. 03 | Tu Dinh parish | 109 | 1 | 110 | 575 | 48 | 623 |
| 16 | GV. 04 | Block 8 – on the left of Cho Cau bridge | 66 | | 66 | 96 | | 96 |
| 17 | PN. 01 | Alley 111 Huynh Van Banh (including alleys 95 HVB, 36 CT) | 101 | | 101 | 183 | | 183 |
| 18 | PN. 02 | Alleys 65, 79 Phan Tay Ho | 230 | | 230 | 720 | | 720 |

| No. | CODE | ZONE TO BE UPGRADED | AFFECTED HOUSES | | | AFFECTED HOUSING LAND | | |
|---------------|--------|---------------------------------------|-----------------|----------|--------------|-----------------------|------------|---------------|
| | | | IN PART | IN FULL | TOTAL | IN PART | IN FULL | TOTAL |
| 19 | PN. 04 | Alley at the end of Cam Ba Thuoc road | 61 | | 61 | 649 | | 649 |
| 20 | PN.05 | Nhieu Tu road | 93 | | 93 | 320 | | 321 |
| 21 | PN.03 | Alley 270 Ng.Trong Tuyen | 105 | 5 | 110 | 446 | 183 | 628 |
| 22 | TĐ. 05 | Block 4 | 177 | | 177 | 1,042 | | 1,042 |
| 23 | TĐ. 06 | Blocks 3 and 5 | 26 | | 26 | 158 | | 158 |
| 24 | TĐ. 07 | Blocks 1 and 2 | 159 | | 159 | 963 | | 963 |
| TOTAL: | | | 3,446 | 6 | 3,452 | 21,642 | 231 | 21,873 |

(Source: Community Upgrading Plan, Saigon Weico, October 2007)

Removal, regardless of in full or in part will strongly affect people because they must change residence, adapt themselves to new life in resettlement sites (for households subject to full removal) or spend long times on repair of houses (for households subject to removal in part). Because they all receive satisfactory support from the compensation and resettlement program (RAP) of the project, the impact is partially lessened.

This impact is assessed as **NEGATIVE – SIGNIFICANT AND POSSIBLE TO MITIGATE**.

3.2.2 Impacts on air quality due to site clearance

Dust will be produced in the site clearance, from removal of works construction as well as repair of affected parts of houses. The dust content will be high. According to analyses of CEECO in the East-West Highway project, dust from similar activities may be up to 1.3 – 2.5 mg/m³ (measured at the site where removal is underway). Therefore, if no covering measure is taken in this phase, dust can cause local pollution. Although the area of removal is large (21,873 m²), because the project will be implemented in short sections in many regions, the intensity of removal will be low and in certain periods, that is controllable (the zone of the largest site of removal is GV.02, 4570m² of 554 households). In other words, it is apparent that the quantity of removal is not large when calculated for each zone.

This impact is assessed as **NEGATIVE - MEDIUM and POSSIBLE TO MITIGATE**.

3.3 IMPACTS ON THE CONSTRUCTION PHASE

The construction of infrastructure of tertiary and 4-level drainages in combination with upgrading of alleys will not have significant environmental impact but it directly affects people residing in zones to be upgraded in case that subcontractors do not take adequate measures for environmental protection. The main sources of pollution during construction

will be shown below, including sources originates from waste matters and other impacts not originated therefore.

3.3.1 Sources of dust pollution

Activities in the construction phase of the project that produce dust are mainly from sources as follows:

- Means for transport of materials such as sand and soil, cement, culverts, etc.
- Construction of alleys, sewers and installation of pipelines

Dust is produced from vehicles used for transporting sand/soil, construction waste. In the project, the quantity to be transported to and from the zones to be upgraded will be:

- Removal of 10,750m³ of spoil for building drains,
- 41,000m³ for filling up and leveling

As such, the total quantity of soil and spoil to be transported to and from the zones to be upgraded will be 52,000 m³, equivalent to 6500 trips of 8m³ trucks to and from 24 zones to be upgraded (270 trips per zone on average).

The transport by trucks will cause the matters and dust pollution as follows:

- Soil adhering to truck tires will be dropped in nearby alleys and blown by wind, causing dust pollution.
- Loose soil and sand will be dropped as dust and emitted by vehicles;
- Truck tires disturb dust when trucks move on temporary and routine roads;
- Dust from emission of vehicles.

Dust from those sources is usually nuisance to local people because it is easy to disperse when vehicles run at high frequency. According to results of the monitoring by ETC and CEECO, the dust content on the roads being upgraded is 0.8 – 2.5 mg/m³ (2005-2007). Thus, dust from those source always cause trouble to people who reside near the roads where construction and upgrading of drain is underway, particularly small roads like those in the project.

Another significant source of dust in the construction phase of the project is digging, which produces dust from heaps of soil and sand in all sites under construction. In case of construction and upgrading tertiary drains and small alleys, even though when the construction quantity is small, the production of dust in this manner still affect the living quality of local people, particularly in the dry season (whereas in the rainy season, the consequence is a muddy state) if the progress and schedule of activities are not controlled. The dust content measured by CEECO at the construction site of drains in Binh Tien indicates that dust content (0.5-1.8mg/m³) is always higher than the Vietnamese standard TCVN 5937-2005.

Conclusion: For the projects of basic infrastructure upgrading like the project, dust is the most attentive source of pollution. In this project TV2_TP2, it is assessed as NEGATIVE – SIGNIFICANT, yet it affects only a limited area near construction sites, for certain

duration and is controllable. Therefore, it is assessed that the dust content in the air in Ho Chi Minh City will not increase because of the project.

3.3.2 Sources of noise

Many activities of the project will produce noise, those include operations of vehicles and construction machines (hammer machines, drilling and cutting machines, excavators, generators, etc.). As the project will be implemented in urban areas, any increase in noise will directly affect people and trading activities, etc.

Noise is produced in the construction phase mostly by operations of vehicles and construction machines such as bulldozers, tractors, excavators, etc.

Noise level is reduced in accordance with the affecting distance and is therefore predictable with the formula as follows:

$$L_p(x) = L_p(x_0) + 20 \log_{10}(x_0/x)$$

$L_p(x_0)$: noise level at the distance of 1m (dBA)

$x_0 = 1$ m

$L_p(x)$: noise level at the distance to be calculated (dBA)

x : position for calculation (m)

Noise levels at the distance of 1 m from their sources and prediction of the maximum levels of vehicles and construction machines are given in Table 3.3.

Table 3.3 – Maximum noise levels from operations of transport and construction means

| No. | Means | Noise, 1m from source(dBA) | | Noise, 20 m from source (dBA) | Noise, 50 m from source (dBA) |
|---------------------------------|----------------|----------------------------|---------|-------------------------------|-------------------------------|
| | | Range | Average | | |
| 1 | Bulldozer | | 93.0 | 67.0 | 59.0 |
| 2 | Road roller | 72.0 ÷ 74.0 | 73.0 | 47.0 | 39.0 |
| 3 | Tractor | 77.0 ÷ 96.0 | 86.5 | 60.5 | 52.5 |
| 4 | Excavator | 80.0 ÷ 93.0 | 86.5 | 60.5 | 52.5 |
| 5 | Truck | 82.0 ÷ 94.0 | 88.0 | 62.0 | 54.0 |
| 6 | Concrete mixer | 75.0 ÷ 88.0 | 81.5 | 55.5 | 47.5 |
| 7 | Air-compressor | 75.0 ÷ 87.0 | 81.0 | 55.0 | 47.0 |
| Standard in workspace | | 85 | | - | |
| TCVN 5949-1998 (6 ÷ 18h) | | - | | 75 | |

Source :Document (1) – Nguyen Dinh Tuan et. Al.; Document (2) - Mackernize, L.da, 1985.

As seen in the table above, when tertiary infrastructure and alleys are built, the households at the construction site as affected objects will suffer noise levels (>70dBA) slightly higher than the standard because the distance from households to sources is less than 10 m. Nevertheless, this impact will exist only in a short time and be controllable.

Conclusion: For the projects of basic infrastructure upgrading like the project, noise is a source of pollution to which attention should be paid. In this project, noise is assessed as NEGATIVE - MEDIUM and only on a limited area near construction sites and

furthermore, this impact will last in a short time and is controllable. The project is also assessed as not to increase the overall noise level of Ho Chi Minh City.

3.3.3 Source of air pollution

Currently, the air quality of Ho Chi Minh City (via CO, NO₂, CO₂) is assessed as rather good though there is an increasing tendency due to traffic, particularly in rush hours. In the project, the number of servicing trucks will be 270 for each zone. That is a source of emissions that contribute to the air pollution in the city. However, given 270 trips for 1 zone to be upgraded and construction is in roll-up mode, it is estimated that only 20-30 trucks moving to and from the zones to be upgraded and therefore the pollution load of those vehicle is small. Besides, since the zones to be upgraded are located in small roads or alleys with low construction density, small construction quantity and the concentration of trucks is therefore low, meaning that it is not a cause of traffic jam in the project site as well as neighboring areas.

Therefore, it is possible to assess that construction activities in the project will not increase the over air pollution level of Ho Chi Minh City because:

- i) Air pollution in urban areas is mainly caused by vehicles and industrial emissions;
- ii) The increase in vehicles in Ho Chi Minh City for the project is inconsiderable,
- iii) The project will lease few industrial machines for a major part of construction.
- iv) The construction duration is short (for separate zones).

However, if the project employs obsolete vehicles and construction machines associated with heavy pollution (emissions), it still partially affects the people living near the construction site. Because the project is in the phase of investment project preparation, official data related to construction machines involved in the project are not available yet, it is impossible to compute pollution loads and predict of concentrations of pollutants in the construction sites.

This impact is assessed as NEGATIVE – MEDIUM and POSSIBLE TO MITIGATE.

3.3.4 Wastewater in the construction phase

The sources of wastewater in the construction phase of the project include:

- Wastewater pumped out from construction sites
- Workers' sanitary wastes

The water pumped from holes made for building the drainage is also considered wastewater. Usually produced after heavy rain, this wastewater does not contain significant pollutants (containing mainly suspended solid) and therefore does not affect the surface water in the region but may lead to poor hygiene, particularly in populated areas. Thus, measures should be taken to control this wastewater.

Sanitary wastewater is produced by living activities of construction workers in the project, who are estimated at 10-20 people in one construction site. The flow is estimated at 0.5-1m³/day, mostly from restrooms because both construction sites and volumes are small, no camp will be built for workers to live and wash and workers will leave construction sites

after working hours. Nevertheless, such a small volume of wastewater still has to be controlled in order to avoid of defecation and urination at the construction sites and resultant pollution.

Thus, this impact is assessed as NEGATIVE – MEDIUM and POSSIBLE TO MITIGATE.

3.3.5 Solid waste

The sources of solid waste in the construction phase are as follows:

- **Spoil and waste matters produced to prepare the site and build drainage:** It is estimated from the scale of construction, i.e. 336m of D2000 culverts; 203m of D1500 culverts; 191m of D1200 culverts; 1581m of D1000 culverts; 3.788m of D800 culverts; 10,296m of D600 culverts; and 21,214m of D400 culverts that the volume of spoil to be moved out of construction sites is 10,750m³, i.e. 450m³ for each zone to be upgraded. Considered a source of solid waste in the project, this should be stored and transported in due time, otherwise pollution due to dust in the dry season or muddy state in the rainy season will occur.

- **Construction waste:** this include the waste matters produced during construction such as iron scrap, used formworks, cement packaging, etc. All are considered waste matters and needed good management.

- **Sanitary solid waste:** It is estimated from the scale of the project that the number of workers in one construction site is limited (approximately 20 people) and therefor the amount of refuse is small. However, it is experienced that littering in construction sites occurs not only by construction workers but also local inhabitants who discharge of refuse to the sites, particularly at corners hidden from view. Littering and poor hygiene are inevitable results of (i) traffic limit; (ii) lacking of local garbage collecting systems; and (iii) many people's bad habit of leaving refuse at any "convenient" place.

This impact is assessed as NEGATIVE – MEDIUM and POSSIBLE TO MITIGATE.

3.3.6 Poor hygiene at the zones to be upgraded

During the construction phase, the project may produce offensive smell from construction sites as well as surroundings if roads are inundated with wastewater (urine of workers and local people as well), sanitary waste of workers in the sites and from local people. That will damage the landscape and cause nuisance to surrounding areas. In fact, this is common in infrastructure construction and upgrading sites in Ho Chi Minh City.

This impact is assessed as NEGATIVE - MEDIUM and POSSIBLE TO CONTROL.

3.3.7 Spillage of oil and hazardous waste

The construction will certainly employ construction machines (for cutting, digging, sawing etc.) and supportive equipment such as generators, which all work with fuel and repair. Oily cloths or spillage of lubricants that may exist during operation or repair of

those machines, if not controlled, can impact water quality and increase traffic accidents and fire risk, particularly when oil or fuel is spilt to main roads.

This impact is assessed as NEGATIVE - MEDIUM and POSSIBLE TO MITIGATE.

3.3.8 Traffic jam

The project will need and therefore add a certain number of trucks and other kinds of vehicles into the traffic of Ho Chi Minh City. That will more or less affect the overall traffic of the city but the impact is limited because the quantity of construction is small, construction sites are scattering in small alleys.

Nevertheless, that will affect the traffic in the sites under construction because:

- Passages are used as roads in construction sites
- Materials may not be gathered as regulated
- The storage and use of raw materials for construction may be not planed and therefore obstruct passages.
- Solid waste and wastewater from construction sites may be not managed.

In the projects similar to this project, the influence on traffic at construction sites, obstructing people's living activities is very common and also a sensitive problem.

This impact is assessed as NEGATIVE – SIGNIFICANT and POSSIBLE TO MITIGATE.

3.3.9 Impacts on living quality of people residing in the construction sites

In addition to positive impacts on people's living quality after the works are put into operation, the project may cause negative impacts on the same in the periods of preparation and construction.

The disturbance that households in the project site will suffer is resulted from not only site clearance and removal but also nuisance as follows:

- Dust and noise throughout the construction.
- Sanitation matters: refuse, inundation, diseases from trouble water.
- Partially obstructed traffic.
- Limits on business (as for groceries)

People's living will be affected by the nuisance mentioned above if the project fails to take strict and sufficient measures for environmental protection as well as comply with the schedule and technical regulations throughout the construction.

This impact is assessed as NEGATIVE – SIGNIFICANT and POSSIBLE TO MITIGATE.

3.3.10 Impacts on sensitive receptors

The investigation of the zones to be upgraded in Districts 9, 12, Thu Duc, Binh Thanh, Go Vap, and Phu Nhuan from August to December 2006 of the Designing Consultant found that the zones to be upgraded in those districts are mostly existing populated areas, with some offices of companies and enterprises and some pagodas and temples with details of sensitive objects as follows:

a) District 9

Zone 09.02 at Block 2, Phuoc Long A ward: In this old residential zone, Phuoc Long pagoda may be a sensitive receptor.

b) District 12

- **Tan Thoi Nhat ward:** zones 12.01, 12.02: some small pagodas, kindergartens, primary schools and Ba Diem junior high school are noteworthy. Corporate entities are small garment and textile ones such as Phuong Dong export garment company, Viet Phu garment co., ltd., Tan Chau garment import and export company, etc.

- **Dong Hung Thuan ward:** zones 12.03, 12.04, 12.05, 12.06, 12.07, 12.08 : those are residential areas with high speed of urbanization and agriculture shrinking and shifting to handicrafts. Companies there include Gia Dinh garment and textile, Phu Think textile, Tan Loc textile, Thai Tuan textile, Phu Loc textile and finishing, etc.

- **Thanh My Loc ward:** zone 12.09 : In this old residential area there is neither company nor significant cultural relics.

c) Thu Duc district

- **Linh Chieu ward:** zone TD.05 : in this old residential area, there are Le Quy Don school, Linh Trung temple and no company.

- **Linh Tay ward:** zones TD.06, TD.07 : in these old residential areas, there is neither cultural relic nor big companies, not to mention the Police Institute near zone TD.07.

d) Binh Thanh district

- **Ward 2:** zones BT.02, BT.07 : in these old populated areas, there is almost no big company. Adjacent to those zones is Ba Chieu, a big market of Ho Chi Minh City.

- **Ward 15:** BT.05: this old populated area is similar with the zones in Ward 2, i.e. having no big company.

e) Phu Nhuan district

- **Ward 7:** 3 zones PN.02, PN.04, PN.05: these residential areas are next to Nhieu Loc - Thi Nghe canal with no company.

- **Ward 8:** zone PN.03 : this residential area has only a small pagoda and no big company.

f) Go Vap district

- **Ward 5:** zone GV.02: people there earn their living on handicraft production. In the zone there are two companies, namely Toan An packaging and Duc Nhi fine art production.

- **Ward 15:** zone GV.03: Tu Dinh parish is located in this region and most people there are catholic.

- **Ward 12:** zone GV.04: this is a residential area with Dinh market nearby and no manufacturing enterprise.

When the project is implemented, those sensitive receptors are adjacent to construction sites but not religious work, school or medical facility will be removed. The impact of the project is therefore assessed as NEGATIVE - MEDIUM and POSSIBLE TO CONTROL.

3.3.11 Other impacts

a) Increasing deterioration of access routes

The project will use some roads around the selected zones as access routes the construction sites. The deterioration rate of those roads will be higher. It is experienced that in similar projects, the damage is big in cases of large scale of construction. For small ones with limited used of heavy-duty trucks and specializing machines like this project, the damage maybe lower. Therefore, this impact is assessed as NEGATIVE/ MEDIUM and POSSIBLE TO CONTROL.

b) Damages to people's assets as well as other public works

Usually, a project of big infrastructure facilities may have incidents (depression, basement cracks, suspensions of water supply or electricity, etc., maybe due to drilling and digging, etc.) that damage people's assets and public works in the vicinity. In case of the project, in which only tertiary drainages are built, this impact is inconsiderable.

This impact is assessed as NEGATIVE/ MEDIUM and CONTROLLABLE.

a) Damages to underground utilities in the construction sites

Building of drainage systems need digging big ditches. As the construction will be done in existing residential where some underground utilities may be available (networking cable, water supply pipelines, telephone cable and some other cables used by the Ministry of Defense), digging without careful exploration will damage them and lead to impacts such as 1) threat to safety of people and workers; and 2) suspension of public services.

This impact is assessed as NEGATIVE/ MEDIUM and POSSIBLE TO CONTROL.

b) Incidents in the construction phase

Construction activities in the project can cause some considerable incidents such as:

- Fire of fuel reserved for construction machines
- Traffic accidents due to vehicles working in the sites or improper isolation of construction works from nearby houses and roads.
- Accidents as a result of unsafe work items exposed to local active children.
- Fatal accidents due to improper use of electrical equipment or poor quality of cables.

3.4 IMPACTS IN THE OPERATION PHASE

3.4.1 Positive impacts

The project will be implemented targeting at upgrading urban infrastructure, at first the tertiary infrastructure of LIAs. Therefore, on completion the project will create new landscapes there, pushing forwards socio-economy of localities in particular and of the city in general, and more importantly, it will help improve people's living quality there.

Urban upgrading, particularly upgrading of tertiary infrastructure is greatly important in terms of improvement of the environment and socio-economy because:

- New drainage and restrooms will help avoid of diseases, lessen inundation, and create better hygienic conditions for living.
- With clean water, households will be protected from diseases of eyes, skin and digestive troubles, etc. That means people's health will be improved while the cost of living is reduced (people will no longer have to buy clean water at exorbitant prices) and on the other hand, the city administration of water will be better with lower loss.
- Upgraded and expanded alleys will provide better conditions for fire prevention and fighting, which is the basic safety of populated areas. Moreover, convenient roads will help save time and lower accidents.
- Together with the project, people will repair, improve or even build new houses which are favorable for new and better living environment and landscape. Furthermore, the values of people's reach estates will be higher (particularly land price) and business families will have better conditions to earn higher income.
- Urbanization of resettlement sites will add values to land prices, create new landscapes, which in turn help to improve education and aware of urban civilization.

3.4.2 Negative impacts

Upgrading of LIAS will bring in many visible and active advantages in term of environmental protection and socio-economic development. In general, positive effects are more than negative impacts. However, some impacts that should be mentioned are as follows:

a) Impacts on the sources receiving wastewater

When the project is put into operation, the density of population in the project site will increase and wastewater from households will be poured into common sewers. That will reduce local pollution but the volume and load of wastewater to receiving sources will increase.

In fact, except the regions having connections with the common sewers of the city, some others in District 12, Go Vap and Thu Duc discharge of wastewater to local canals. The most attentive is zone GV.02 at Ward 5, Go Vap district, which pours wastewater to Lang arroyo and Vam Thuat canal, And on receiving wastewater from zone GV.02, Vam Thuat canal will have its water quality changed more or less. It is estimated from the number of beneficiaries in zone GV.02 (600 households, equivalent to 3000 people) that the flow of wastewater is 540m³/day with pollutant loads and concentrations as shown in Table 3.5.

Table 3.5 – Computation of loads and concentrations of pollutants in sanitary wastewater

| No. | Parameter | Coefficient (g/man/day) | Load (kg/day) | Concentration (mg/l) |
|-----|----------------|----------------------------|------------------|-------------------------|
| 01 | Total N | 6-12 | 18-36 | 34-67 |
| 02 | Total P | 0.6-4.5 | 1.8-13.5 | 3.3-25 |
| 03 | SS | 70-145 | 210-435 | 389-806 |
| 04 | COD | 85-102 | 255-306 | 472-566 |
| 05 | BOD5 (20°C) | 45-54 | 135-162 | 250-300 |

As such, parameters of that wastewater are higher than the allowable limit of TCVN 5945:2005 (source B).

b) Noise

Upgraded residential areas will attract more people and noise produced by vehicles and living activities will be also heavier.

c) Air pollutants

In the operation phase, air pollutants will be produced mostly by existing factories and entities and vehicles. Compared with the time before implementation of the project, alleys are wider in case that people choose them as shortcuts, air pollution will be higher in the newly upgraded zones.

d) Solid waste

- **Domestic solid waste:** Better living conditions with newly upgrade infrastructure facilities will lead to larger volumes of solid waste. Therefore, if collection of refuse is not improved, pollution due to solid waste will be a matter of concern. If people still liter, hygienic conditions will be unchanged and the newly upgraded drainage may be choke soon.

- **Waste - sludge from septic tank:** The project content does not include the item of septic tank construction in upgraded areas, so the septic tanks is constructed encouragingly by residents. Therefore, there is no basic for calculating the load of waste-sludge from septic-tank. The management of septic tank sludge from residents at present and after upgraded will follow the management of Urban environment service Company of District/city level.

e) Bad impacts on people's living

Besides benefits from the projects, a part of people may suffer bad impacts. For instance, the moving of some households to new residence will break the old community relationships, many people will never live near old neighbors. The ones who leave the old residence will have to adapt to new living conditions, new neighbors and sometimes new jobs if the old jobs are no longer suitable (for instance, the ones who earn their living on providing services such as hairdressing, clothing, food shops, etc. may fail to do the same jobs in new places, where providers of those services are abundant).

f) Impacts on the construction and the operation of the project due to the increasing of population in these zones

The increasing of population in these upgraded zones is not able to happen because these zones are low income residential zones (former overpopulation). The widen alleys is not able to make good way for mechanic population growth in upgraded zones. In most cases, the increasing of population may happen the area with new street.

CHAPTER 4 POLLUTION CONTROL MEASURES

4.1 MEASURES FOR THE PRE-CONSTRUCTION PHASE

In the phase of designing and preparation for construction, some solutions have been and will be realized to control the impacts that will occur in the construction and operations phases of the project.

4.1.1 Designing with community participation

Since the objects of the project are LIAs and its target is to bring in better living conditions, it is designed based on community participation, for which the designing consultant and the investor have organized many sessions of community counsel for determination of the zones to be upgraded as well as upgrading alternatives. For every investigation zone, given it meets parameters for upgrading (for instance, stability for at least 10 years, no overlapping with any other project, etc.), the designing consultant holds at least meetings with local people for introducing design embodiments, to which people can express their reaction and then vote on the design selected (i.e. alleys should be upgraded as initially recommended, or larger or narrower). Only zone that has more than 80% votes is included in the list of zones to be upgraded in the project. That means if the vote is lower than required, that zone will be withdrawn from the list.

As such, designing with community participation has more or less reduced the impacts on local people's living quality.

4.1.2 Restriction of impacts resulted from site clearance and removal

After scales and design embodiments are determined with people's consent, the RAP is prepared for the people whose land and/or houses will be removed partially or in full.

Details of the site clearance plan will be presented in the documents of the PMU for the Ho Chi Minh City Urban Upgrading project. Following are some viewpoints of the EIA study team. The principles of resettlement in the project should express in the bases as follows:

i) Restriction of negative impacts: In the design phase, the PMU should ponder and may change some parameters so as to restrict impacts on land, assets and particularly the number of houses to be removed for the project.

ii) Compensation at nearly actual price: This is to apply to any affected assets, including housing land, houses, construction works, business facilities, etc. It should be ensured that affected people have new residence and living conditions better or at least equal to the old ones.

iii) Community participation and counsel: The RAP should be prepared and implemented with the PAP's or their representatives' opinions incorporated therein. The active participation of communities throughout preparation and implementation of the RAP should be concentrated on: determination of compensation rate, land allocation, planning, development and arrangement of rehabilitation sites, and

designing of supportive programs. Attention should be paid to people's opinions in the processes of planning, selection of compensation modes, site clearance and resettlement. The RAP should also address people's concerns. The resettlement division (under the Site Clearance Committee of the city) should cooperate with the PMU in order to guide resettlement committees of districts to work out work schedules prior to realization of relevant policies. Aspirations of every PAP who will move the resettlement sites should be taken into account. After the number of households which desire to move in the resettlement sites recommended by authorities of districts or the city, such rehabilitation sites should be built up with sufficient public services and facilities.

iv) Stable income: In fact, the PAPs in this project are dependent on the low income which is earned from hire works and the like. Therefore, measures should be taken such that their income and living conditions are higher or at least equal to the current ones. Measures of income stabilization, supports for training and soft credits, etc. should be incorporated in the RAP of the project.

v) Settlement of questions: Any question or claim by people of any matters during the processes of land withdrawal, compensation and resettlement should be sent to district site clearance committees at the soonest. Site clearance committees of districts and the city should set up good mechanism to address questions and claims.

vi) Objective monitoring (external monitoring): The PMU should sign a contract with a socio-economics specializing agency on independent monitoring and periodic assessment of resettlement activities. This independent monitoring agency should prepare periodic reports on the implementation of the RAP as well as recommendations for relevant matters.

vii) Reporting: The PMU shall hold regular meeting with the site clearance committees of the city and districts to discuss the progress of the RAP implementation as well as the matters to be addressed. Progress reports should show the matters that are likely to occur in all aspects of the implementation. The PMU and the site clearance committees should ponder those matters and give out addressing orders.

4.1.3 Control of pollution due to site preparation

As mentioned in Chapter 3, partial removal houses will affect the local air environment and noise but the impact is medium and controllable by means of measures as follows:

- Monitoring and reminding people to cover up removal and construction sites.
- The subcontractor being required by the investor to cooperate and provide supports such as means for transporting spoil out of people's removal sites.
- Watering roads in the period when people remove parts of their houses.

4.2 MITIGATION OF IMPACTS IN THE CONSTRUCTION PHASE

4.2.1 Control of dust and air pollution

An inevitable impact of infrastructure upgrading projects is air and dust pollution in the construction phase. Nevertheless, all air pollution sources are point out as mentioned in **Chapter 3** and control measures are also provided. The measures to apply in order to control dust and air pollutants in the construction phase of the project are as follows:

- i) Open construction sites as well as heaps of materials pending for use or transport should be watered regularly. Heaps of construction materials like cement should be covered up to limit dust.
- ii) Movable iron sheet walls (for roll-up construction) of at least 2 m height should be use to avoid of dust emission and to prevent accidents due to children.
- iii) The zones used to gather construction materials and machines should be managed strictly. Drips and drops of materials should be avoided. Temporary warehouses (if required) should be built and covered up and isolated with fences.
- iv) Any vehicle transporting materials and spoil to and from construction sites should be covered up. Overloaded vehicles should be prohibited.
- v) All the vehicles that serve the project should bear the logo of the project and abide by all traffic rules with no operation in rush hours. The speed of vehicles in the site, nearby alleys should be limited at 5km per hour and the limit speed in urban areas should be 30km per hour.
- vi) All vehicles should be washed (if possible) before leaving construction sites.
- vii) All vehicles and machines should receive proper maintenance.
- viii) All machines and vehicles used in construction sites should strictly abide by safety regulations set forth by Ho Chi Minh City Service of Transport and Public Works.
- ix) Use of machines that use low standard fuel should be restricted so as to mitigate the impacts that may pollute the environment.
- x) Construction machines with low emissions should be employed to reduce emission. Sources of emission should be arranged far from people's houses. All construction machines and vehicles should meet the standard on emissions (TCVN 6438:2001) and all industrial machines should meet the same standards applicable to equipment (TCVN 5939:2005, TCVN 5940:2005)

All the measures for mitigating air and dust pollution as recommended above will be obliged in the detailed technical documents of the project and also the obligatory technical standards that subcontractors should comply with.

4.2.2 Control of noise pollution

Many activities of the project will produce noise, for instance, operation of vehicles and construction machines (hammer machines, drilling, cutting and digging machines, etc.; and generators, etc. In order to mitigate impacts of noise, the project should strictly take the measures as follows:

- i) Restriction of activities in nighttime: Noisy machines should be operated in daytime. Any nighttime activities should be done using noise-reducing means or low-noise technologies.
- ii) Restriction of mechanical machines in sensitive objects such as schools and offices.
- iii) Use of noise-reducing means for construction machines, if required.
- iv) Publishing and registration of working time of construction machines with local authorities and strictly compliance therewith.
- v) Use of only equipment and vehicles that meet the Vietnamese standards TCVN 5949:1998 on noise production and TCVN 6962:2001 on vibration applicable to construction machines.

4.2.3 Mitigation of pollution due to wastewater in the construction phase

In the construction phase of the project, wastewater includes the water pumped from construction sites and workers' sanitary wastewater. Both sources should be controlled so as to restrict any impacts on people's living quality. Recommended measures include:

- i) **For water pumped from construction sites:** The construction of drainage systems may produce wastewater which may be trouble water in holes and ditches in construction sites or sanitary wastewater discharged by families nearby. To address this matter, the project should use pumps to discharge it to existing sewers, targeting at no trouble water in the sites as it is viable for nuisance (flies, mosquito, offensive smell, etc.). In case that existing sewers are too far and direct pumping becomes infeasible, the project should use the method of natural settlement in pits then specializing tank trucks to collect and discharge.
- ii) **Construction worker's sanitary wastewater:** Although the total scale of the project is big, since it is divided into 21 zones to be upgraded and therefore, the number of workers in one construction site is as low as 10-20 people, the sanitary wastewater of whom is estimated at 0.5-1m³ per day. Because the sites are located in full in residential areas, the quantity of and space for construction are limited, the measure to mitigate this kind of pollution is to rent mobile restrooms of the city, in details, one 2-room mobile restroom for each site. In case that it is possible to rent houses of local people to store construction machines so as not to encroach roads, restrooms available in those houses should be used.

4.2.4 Control of pollution due to solid waste

The solid waste in the construction will be from the discharging sources as follows:

- i) **Leveling and digging for installing drainages:** It is estimated from the scale of drainages to be upgraded in the project that the volume of spoil to be moved out of construction sites at the soonest and transported to suitable places is approximately 48,000m³ (for 24 zones to be upgraded). In case that spoil is reused for upgrading alleys, it should be properly stored in the zones to be upgraded or nearby. The monitoring consultant and the investor should cooperate with subcontractors to arrange the construction schedule such that the spoil of one site is reused soon in another site, meaning that spoil will not be exposed to the environment that may cause dust in sunny days and muddy state in rainy days.
- ii) **Construction wastes:** Those are produced by construction activities, for instance scrap iron, cement packaging, used formworks, etc. All of those materials are considered waste and should be gathered in specific zones then sold or disposed as regulated. Such zones may be built inside construction sites or houses in the sites should be leased for storing recoverable waste matters.
- iii) **Sanitary wastes:** All sanitary solid waste from workers should be collected in closed tanks and contracts with local garbage collecting entities should be signed on daily collection. Furthermore, subcontractors should be responsible for collecting all the waste matters inside construction sites, not to form garbage heaps in the zones for which they are responsible.

4.2.5 Control of environmental hygiene in the zones to be upgraded

Good control of environmental hygiene in the zones to be upgraded in the construction phase of the project will be one of its good performance. In order to reach that end, the project should take measures as follows:

- i) During construction, subcontractors should be responsible for tidying up the zones (inclusive of any garbage disposed by people of poor aware of environmental protection), pumping out wastewater in holes and ditches inside the construction sites such that no garbage heap or trouble water exist to worsen hygienic conditions in the zones.
- ii) Wastewater should be pumped to nearby sewers or collected and transported by specializing truck tanks for suitable disposal.
- iii) Sensitive places (food shops and markets and the like) should be free solid and liquid waste matters from the project.
- iv) Workers' sanitary solid wastes should be collected to tanks and contracts should be signed on transport thereof out of construction sites on a daily basis.
- v) Construction waste should be covered up or kept under temporary warehouses or leased houses.

- vi) Construction workers should be absolutely prohibited from careless defecation and urination.
- vii) All workers should observe regulations on safety and keep overall safety for the whole the construction sites.

4.2.6 Control of spillage of oil and hazardous wastes

This is aimed at protecting the relevant community and workers from health risks when they contact directly or indirectly with spilt oil or hazardous wastes. The measures to be taken include:

- i) Vehicles, pumps and equipment with significant oil leakage must be moved out of construction sites by means of specializing means and the spillage positions should be treated immediately.
- ii) Vehicles, pumps and equipment should not be repaired in construction sites. In opposite, they should be transported to repair zones.

4.2.7 Restriction of traffic jam

The project will need and therefore add a certain number of trucks and other kinds of vehicles into the traffic of Ho Chi Minh City. That will more or less affect the overall traffic of the city but the impact on local traffic, i.e. at the zones to be upgraded will be significant. Therefore, some measures to restrict traffic jams are recommended as follows.

- i) Cooperation with local authorities for regulating traffic and reducing traffic jams in the places where fences for construction have been set up.
- ii) Establishment of temporary passages and avoidance of moving in rush hours, if possible.
- iii) Determination of temporary passages prior to construction and upgrading same when needed.
- iv) Providing signposts, flash lights and traffic measures for traffic and work safety prior to digging roads.
- v) Roll-up construction, i.e. only moving to another section after installation of culverts and restoration of surface of one section.
- vi) Restoration of road faces at the soonest. After completion, faces of roads and alleys and sidewalks should be cleaned to secure traffic safety.
- vii) Transportation and supply of materials as scheduled in due time (out of rush hours) throughout the construction.
- viii) Designing roadmaps for construction machines so as to avoid of traffic jams.
- ix) Maintaining the fences around big construction sites to determine limits of construction activities.

- x) Proper use of objects for guiding traffic in rush hours;
- xi) Full respect to the parts of roads used for traffic; prohibition subcontractors from leaving any machines on parts left for traffic.

4.2.8 Restriction of impacts on people's living quality in the construction sites

a) Restriction of impacts due to site clearance and removal

Restriction of impacts due to site clearance and removal is also the good implementation of policies on compensation, site clearance, and support for affected households that Ho Chi Minh City has applied based on regulations set forth by the Vietnamese government. In Vietnam the RAP (Resettlement Action Plan) is also called site clearance plan. It is the viewpoint of some international organizations that the basic principle of non-voluntary resettlement is *“the people who must move out should be supported for improving their living conditions with the new income or production at least equal to the old ones”*.

Details of the site clearance plan will be presented in the documents of the PMU for the Ho Chi Minh City Urban Upgrading project. Following are some viewpoints of the EIA study team. The principles of resettlement in the project should express in the bases as follows:

i) Restriction of negative impacts: In the design phase, the PMU should ponder and may change some parameters so as to restrict impacts on land, assets and particularly the number of houses to be removed for the project.

ii) Compensation at nearly actual price: This is to apply to any affected assets, including housing land, houses, construction works, business facilities, etc. It should be ensured that affected people have new residence and living conditions better or at least equal to the old ones.

iii) Community participation and counsel: The RAP should be prepared and implemented with the PAP's or their representatives' opinions incorporated therein. The active participation of communities throughout preparation and implementation of the RAP should be concentrated on: determination of compensation rate, land allocation, planning, development and arrangement of rehabilitation sites, and designing of supportive programs. Attention should be paid to people's opinions in the processes of planning, selection of compensation modes, site clearance and resettlement. The RAP should also address people's concerns. The resettlement division (under the Site Clearance Committee of the city) should cooperate with the PMU in order to guide resettlement committees of districts to work out work schedules prior to realization of relevant policies. Aspirations of every PAP who will move the resettlement sites should be taken into account. After the number of households which desire to move in the resettlement sites recommended by authorities of districts or the city, such rehabilitation sites should be built up with sufficient public services and facilities.

iv) Stable income: In fact, the PAPs in this project are dependent on the low income which is earned from hire works and the like. Therefore, measures should be taken such that their income and living conditions are higher or at least equal to the current

ones. Measures of income stabilization, supports for training and soft credits, etc. should be incorporated in the RAP of the project.

v) Settlement of questions: Any question or claim by people of any matters during the processes of land withdrawal, compensation and resettlement should be sent to district site clearance committees at the soonest. Site clearance committees of districts and the city should set up good mechanism to address questions and claims.

vi) Objective monitoring (external monitoring): The PMU should sign a contract with a socio-economics specializing agency on independent monitoring and periodic assessment of resettlement activities. This independent monitoring agency should prepare periodic reports on the implementation of the RAP as well as recommendations for relevant matters.

vii) Reporting: The PMU shall hold regular meeting with the site clearance committees of the city and districts to discuss the progress of the RAP implementation as well as the matters to be addressed. Progress reports should show the matters that are likely to occur in all aspects of the implementation. The PMU and the site clearance committees should ponder those matters and give out addressing orders.

b) Restriction of impacts of construction on people's living quality

Construction activities in the project will more or less affect people's living quality in the zones. Those impacts are inevitable but controllable should subcontractor take all environmental protection measures recommended above in the construction phase.

4.2.9 Restriction of other impacts and prevention of incidents

a) Damages to access routes

The project should take measures to minimize any impacts on the road systems in the vicinity of construction sites, those include:

- i) State of roads should be recorded in details prior to construction activities;
- ii) Adjacent roads should be checked up in term of quality on a weekly basis and repaired if required throughout the construction;
- iii) After construction, roads should be re-checked and compared with the previous state and in case of any downgrade, related roads should be restored to the recorded state.

b) Damages to people's assets as well as public works

Any damage to people's assets and public works due to any work items of the project or incidents during construction should be remedied by the project so as not to cause everlasting damages. The measures recommended include:

- i) Subcontractors should employ construction methods that cause lesser impacts on people's construction works and preventive measures should be passed by engineers of the project before being taken;

- ii) Compensation should be paid to any damages in case that proper preventive measures have not been taken. The value of compensations should make up the actual loss.
- iii) In case of incidents, local authorities and affected people should be cooperated for compensation satisfactory to people.

c) Damages of underground utilities in the construction sites

In order to minimize damages to underground utilities, in the investigation period, the project should collect full information related to underground utilities and digging should be carefully done, even manually if required. Recorded or suspected positions of available underground utilities should be given on technical drawings used for construction, in case that management bodies alarm of the existence of underground utilities, careful exploration should be made before digging in mass so as to recommend proper measures for moving and digging, not to damage underground cable, water supply pipelines, telephone cables and specific cables of the Ministry of Defense.

d) Prevention of incidents

Construction activities in the project may be causative of some significant incidents. The project should take measures to prevent incidents as follows:

- i) All fuel-using means should be strictly managed. Storage of fuel at construction sites should be prohibited so as to avoid of fire.
- ii) All construction machines and vehicles should abide by the regulatory speed of 5km per hour in the sites under construction. In case of using specializing means, they should be isolated and responsible people should be appointed to warn people of danger related to such specializing means.
- iii) All digging and installing work items that are not accomplished should be isolated and warned of by signposts and flash lamps in nighttime so as to avoid of accidents to motorcycles riders in the rainy season as well as to active children nearby.
- iv) All electrical means and cables should meet safety standards and be checked regularly to avoid of electricity-related accidents (to workers and people).

4.3 MITIGATION OF IMPACTS IN THE OPERATION PHASE

Upgrading of LIAs will bring about apparent and active advantages in environmental and socio-economic aspects and people, which improved facilities and services, less risk to inundation less exposure to trouble water, will have conditions for better health. However, there are some negative impacts that the project should take measures to mitigate. Those include:

4.3.1 Mitigation of impacts on the water environment

a) Managerial measures to mitigate impacts on the water environment

For the zones to be upgraded that connect to available sewers of the city, the following measures should be taken to mitigate the impacts on surface water:

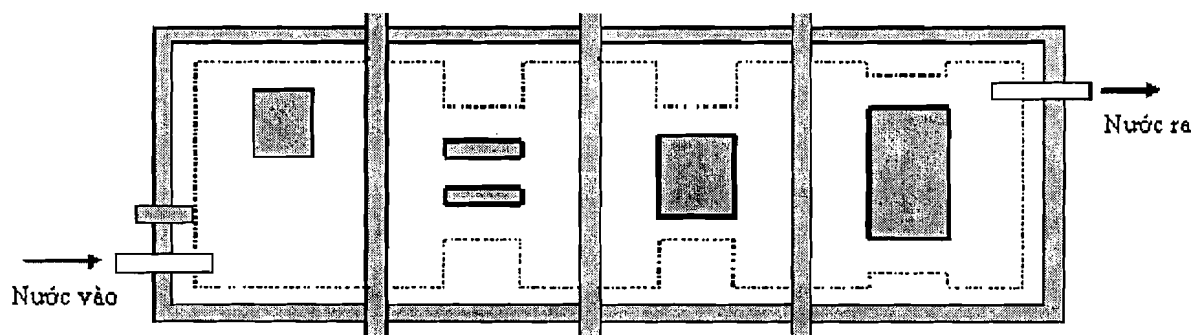
- Setting up teams for regular management and cleaning alleys so as to avoid runoff water from bringing garbage to surface water sources.
- Encouraging /requiring people's treatment of wastewater by means of septic tanks before discharge to common sewers
- Periodically dredging of sewers and ditches to avoid of trouble water and spillage that are causative of poor landscape and hygiene in the project site.
- Moving out or strictly controlling local companies and enterprises such that they do not discharge effluent to the environment.

b) Measures to mitigate impacts on the water quality of Vam Thuat canal

As mentioned in Chapter 3, zone GV.02 with 3000 inhabitants to enjoy the benefits of the project has the end connection at Lang arroyo (pouring water to Vam Thuat arroyo) and Vam Thuat arroyo. When the project is accomplished, the zone will discharge of wastewater at 540m³/day with concentrations of pollutants exceeding the Vietnamese standard TCVN 5945:2005 (class B). In a non-profit project of infrastructure construction like the project, construction of an effluent treatment factory is not feasible. Therefore, in order to mitigate this impact, the project should take measures as follows:

- i) Encouraging households in the zone to enjoy benefits of the project to build 3-compartment septic tanks with a filtration compartment and the standard volume of 3m³. A schematic drawing showing such septic tank is given in Figure 4.1.

Figure 4.1 – Structure of 3-compartment septic tank with a filtration compartment



- ii) In fact, wastewater after treatment in 3-compartment septic tanks as mentioned above still fails to meet the Vietnamese standard TCVN 5945-2005 class B but Vam Thuat arroyo is included in the project of “**drainage and lessening pollution of Tham Luong – Ben Cat – Nuoc Len canal**”. Main contents of this project are:

- Dredging, consolidating basement, building technical side corridors, preventing erosion and treating polluting mud
- Repairing and building relevant facilities
- Upgrading and building specific drainages for rain water (secondary and tertiary)
- Building systems for drainage and **treatment of wastewater**
- Upgrading side corridors of the canal

- Upgrading waterways of levels 4 and 5

As such, in the project of upgrading **Tham Luong – Ben Cat – Nuoc Len canal**, a system for treatment of wastewater will be built and therefore, wastewater from zone GV.02 after treatment by means of septic tanks as mentioned above will be further treated.

4.3.2 Measures to control air pollution and noise

- Frequently cleaning roads to reduce dust and watering roads in the dry season for the same purpose.
- Restricting heavy duty trucks; allowing on dump trucks that meet sanitary standard, i.e. having covers and not dripping garbage leachate.
- Encouraging families to plant trees in the surroundings of their houses.
- Managing and restricting noisy entertainment businesses.

4.3.3 Measures to reduce pollution due to solid wastes

- Households storing and classifying refuse in dust bins (in plastic bags) before dump trucks come to take it away.
- Educating people for better awareness of environmental protection and being refrained from littering.
- Encouraging households to save materials and make full use of recoverable components so as to reduce the volume of refuse to be discharge to the environment.

CHAPTER 5

UNDERTAKING TO TAKE ENVIRONMENTAL PROTECTION MEASURES

After the project is implemented, in addition to infrastructure, the living conditions of communities the zones to be upgrade in the project site will be improved. Nevertheless, during construction as well as operation of the project, there will be some environmental matters that may affect people. Therefore, the investor undertakes to take environmental protection measures as follows:

5.1 UNDERTAKING TO TAKE POLLUTION CONTROL MEASURES IN THE CONSTRUCTION PHASE

The investor undertake to take measures to mitigate negative impacts in the construction phase as mentioned in **Chapter 4**, those include:

- Management for control of pollution rights at their sources
- Restriction of any impact on living conditions of people in the construction sites
- Mitigation of negative impacts of vehicles and construction machines
- Mitigation of pollution due to sanitary waste water and solid waste
- Mitigation of pollution due construction waste
- Mitigation of pollution due to solid wastes and having contracts with entities which have functions of collection
- Reduction of any possible environmental incidents
- And others.

5.2 UNDERTAKING TO TAKE MEASURES TO MITIGATE POLLUTION IN THE OPERATION PHASE

The investor undertake to take measures to mitigate negative impacts in the operation phase as mentioned in **Chapter 4**, those include:

- Frequently monitoring and controlling the air environment in the region and taking treatment measures in due time.
- Dredging and collecting mud in the project site
- Preparing the program for garbage classification and mobilizing people to take part
- Setting up operation targets and initiating the environmental monitoring plan
- Establishing the procedure of annual reports and cooperating with the MORE
- Monitoring of influences on the society and public health in the surroundings of the project site.

5.3 UNDERTAKING TO COMPLY WITH ENVIRONMENTAL STANDARDS

The investor undertakes that activities of the project will strictly comply with the environmental standards as follows:

- TCVN 5937:2005 and TCVN 5938:2005 applicable to the air environment.
- TCVN 5939:2005 applicable to emissions of vehicles and construction machines
- TCVN 5949-1998 applicable to noise
- TCVN 5948-1998 applicable to noisy equipment
- TCVN 6962:2001 applicable to vibration during construction
- TCVN 6706:2000 and TCVN 6760:2000 applicable to hazardous waste.
- TCVN 6772:2000 and TCVN 5945:2005 applicable to sanitary wastewater after treatment

5.4 ENVIRONMENTAL MANAGEMENT

The investor will coordinate with functional state bodies in designing, construction and operation of pollution control systems so as to meet regulatory environmental standards and prevent of environmental incidents.

The investor undertakes to bear full liability for any infringement on any international convention, the Vietnamese standards and in case of any incident that leads to environmental pollution.

CHAPTER 6

ENVIRONMENTAL TREATMENT FACILITIES, ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAMS

6.1 LIST OF ENVIRONMENTAL TREATMENT FACILITIES

The lists of environmental treatment works in the construction phase and the operation phase of the project are given in *Table 6.1*.

Table 6.1 – List of facilities and equipment for environmental treatment

| No. | Name of treatment work | Duration |
|--|--|--|
| <i>I. Preparation and construction phase</i> | | |
| 01 | Taking all measures and works for controlling pollution due to dust, noise; providing work protection facilities for workers in the construction sites. | From preparation for construction till the end of construction. |
| 02 | Control of pollution due to sanitary wastewater: providing mobile restrooms, or leasing. Providing effluent pumps and specializing means of transport. | From preparation for construction till the end of construction |
| 03 | Control of solid waste pollution: Providing covered refuse tanks, 240 L each, collecting sanitary waste within a day. | From preparation for construction till the end of construction. |
| <i>II. Operation phase</i> | | |
| 04 | - Building drainage meeting standards as designed for draining. - Encouraging families to build restrooms as regulated and to connect to common sewers. | Installation together with the construction for using after the end of the construction. |
| 05 | Control of solid waste pollution: Providing covered refuse tanks at the zones to be upgraded in the project (200 L each,) | After the project is put into operation |

6.2 ENVIRONMENTAL MANAGEMENT PROGRAM

The program of environmental management and monitoring and pollution control is one of the key functions of environmental management and also one of the key components of EIA. This program is to verify the accuracy of predictions. It enables detection of any changes in the environment and recommendations of countermeasures in due time to mitigate negative impacts on people and the environment of the region affected by the project. In order to meet requirements related to its targets, environmental management should be done during and after construction.

- Construction management with two main targets: (1) ensuring that a countermeasure to a specific impact is effectively implemented; (2) solving any matters or unclear points in the preparation of the environmental management program or any emergence of any unpredicted matters during the construction.

Monitoring during the construction is a methodical procedure to be recommended in the project. Yet parameters, frequency, reporting methods and solutions for actual management should be determined carefully by engineers and subcontractors of the project.

- Operation management with two main targets: assessments on negative and positive impacts in the region affected by the project.

6.2.1 Impacts / Countermeasures

Detailed countermeasures mentioned in **Chapter 4** of this report should apply to all impacts in both construction and operation phases. **Table 6.2** summarizes environmental impacts and possible countermeasures to apply in order to mitigate or avoid of negative impacts when the project is implemented within the scope of the environmental management program.

Table 6.2 – Summary of solutions and activities to deal with impacts in three phases of the project (pre-construction, construction and operation)

| Pollution / impact | Act or solution | In charge |
|----------------------------------|--|---|
| I. PRE-CONSTRUCTION PHASE | | |
| | Setting up methods and responsibility in monitoring of construction/ cooperating with the MORE for consent related to assessment coefficients and frequency and the mechanism to solve conflicts | PMU/Consultant |
| | Clearly defining the construction sites, main roads for transport, conflicts and adjustment during transportation | Subcontractor |
| | Determining construction schedules and implementing the plan for disseminating information of the project and its activities (schedules and deadlines) to communities | Subcontractor/Consultant |
| | Preparing for approaching sensitive points and further disseminating basic information | Subcontractor/Consultant |
| | Setting up hot lines for interactions with communities (determining regulatory responsibility for community relationships) | PMU |
| | Training / debriefing employees of subcontractors and the MORE about the environmental management plan | PMU/Consultant |
| | Preparing approaching methods in monitoring of construction environment, determining responsibilities, reporting, mechanism for addressing problems | PMU/Consultant/ Monitoring engineer/ Subcontractor/ MORE |

Table 6.2 (cont.)

| Pollution / impact | Act or solution | In charge |
|-------------------------------|--|--|
| II. CONSTRUCTION PHASE | | |
| Dust pollution | Frequently watering the construction sites. | PMU/Consultant |
| | For building big culverts, setting up movable iron sheet walls (for roll-up construction) of at least 2 m height to avoid of dust emission | Subcontractor |
| | Strictly manages the zones used to gather construction materials and machines, avoiding of drips and drops of materials, building temporary warehouses (if required) covering to avoid of dust from emitting, setting up fences to isolate those gathering zones. | Subcontractor/Consultant |
| | Covering up any vehicle transporting materials and spoil to and from construction sites, prohibiting overloaded vehicles | Subcontractor/Consultant |
| | Sticking logos the logo of the project on all vehicles that serve the project and enforcing them to abide by all traffic rules. In details, that means the speed of vehicles in the site, nearby alleys should be limited at 5km per hour and the limit speed in urban areas should be 30km per hour. | PMU |
| | Washing all vehicles (if possible) before their leaving construction sites. | PMU/Consultant |
| | Providing proper maintenance for all vehicles and machines and enforcing them to abide by safety regulations set forth by Ho Chi Minh City Service of Transport and Public Works. | |
| | Restricting the use of machines that use low standard fuel so as to mitigate the impacts that may pollute the environment. | PMU/Consultant/ Monitoring engineer / |
| | Employing construction machines with low emissions to reduce emission, arranging sources of emission far from people's houses. All construction machines and vehicles should meet the standard on emissions (TCVN 6438:2001) and all industrial machines should meet the same standards applicable to equipment (TCVN 5939:2005, TCVN 5940:2005) | Subcontractor/ DONRE |
| Noise pollution | Operating noisy machines in daytime. Any nighttime activities should be done using noise-reducing means or low-noise technologies. | |
| | Publishing and registering working time of construction machines with local authorities and strictly compliance therewith; restricting use of mechanical machines in sensitive objects such as schools and offices; Using noise-reducing means for construction machines, if required | PMU/ Consultant/ Monitoring engineer / Subcontractor / DONRE |
| | Employing only equipment and vehicles that meet the Vietnamese standards TCVN 5949:1998 on noise production and TCVN 6962:2001 on vibration applicable to construction machines. | |

| Pollution / impact | Act or solution | In charge |
|--|---|--|
| Pollution due to waste-water | <ul style="list-style-type: none"> - Using pumps to discharge wastewater to existing sewers after filtration impurities. - In case that existing sewers are too far and direct pumping becomes infeasible, using specializing tank trucks to collect and discharge it at regulated places. - Leasing mobile restrooms of the city, one 2-room mobile restroom for each site. - Renting houses of local people to store construction machines and using restrooms available. | PMU/ Consultant/ Monitoring engineer/ Subcontractor + MORE |
| Pollution due to solid waste | <ul style="list-style-type: none"> Arranging construction schedules such that the spoil of one site is immediately reused in another site - Gathering construction waste in specific zones then selling or disposing as regulated. - Gathering zones may be built inside construction sites or houses in the sites should be leased for storing recoverable wastes. - Collecting all sanitary solid waste from workers in closed tanks and signing contracts with local garbage collecting entities on daily collection. - Furthermore, subcontractors should be responsible for collecting all the waste matters inside construction sites, not to form garbage heaps in the zones for which they are responsible. | PMU/ Consultant/ Monitoring engineer/ Subcontractor / MORE |
| Environment at the zones to be upgraded | <ul style="list-style-type: none"> Pumping wastewater to nearby sewers or collecting it with specializing truck tanks for suitable disposal Keeping sensitive places (food shops and markets and the like) to be free of solid and liquid waste matters from the project Collecting workers' sanitary solid wastes to tanks and signing contracts on transport thereof out of construction sites on a daily basis Covering up construction waste or keeping it under temporary warehouses or leased houses. Prohibiting construction workers from careless defecation and urination. Requiring all workers observing regulations on safety and keeping overall safety for the whole the construction sites | PMU/ Consultant/ Monitoring engineer/ Subcontractor / MORE |
| Control of spillage of oil and hazardous waste | <ul style="list-style-type: none"> - Moving vehicles, pumps and equipment with significant oil leakage out of construction sites by means of specializing means and immediately treating the spillage positions. - Not repairing vehicles, pumps and equipment in construction sites but transferring them to repair zones. | PMU/ Consultant/ Monitoring engineer/ Subcontractor / MORE |
| Mitigation of traffic | Coopering with local authorities for regulating traffic and reducing traffic jams in the places where fences for construction have been set up. | - PMU - Consultant |

| Pollution / impact | Act or solution | In charge |
|---|--|---|
| | <ul style="list-style-type: none"> Setting up temporary passages for households and restricting moving in rush hours, if possible. Determining temporary passages prior to construction and upgrading same when needed. Restoring road faces at the soonest. Having transportation and supply of materials as scheduled in due time (out of rush hours) throughout the construction. Designing roadmaps for construction machines so as to avoid of traffic jams. Maintaining the fences around big construction sites to determine limits of construction activities. Properly using objects for guiding traffic in rush hours; Fully respecting the parts of roads used for traffic; prohibiting subcontractors from leaving any machines on parts left for traffic. | <ul style="list-style-type: none"> - Monitoring engineer - Subcontractor - MORE - Local authorities |
| Damages to access routes | <ul style="list-style-type: none"> - Recording the state of roads in details prior to construction activities; - Checking up adjacent roads in term of quality on a weekly basis and repairing if required throughout the construction - After construction, re-checking roads and comparing with the previous state and in case of any downgrade, related roads should be restored to the recorded state. | PMU/ Consultant/ Monitoring engineer/ Subcontractor + Subcontractors/ Dept. of Civil Works and Transport |
| Damages to underground utilities | <ul style="list-style-type: none"> - Collecting full information related to underground utilities - Recommending proper measures for moving and digging, not to damage underground cable, water supply pipelines, telephone cables and specific cables of the Ministry of Defense | PMU/ Consultant/ Monitoring engineer/ Subcontractor + Relevant departments |
| Damages to people's assets and other public works | <ul style="list-style-type: none"> - Subcontractors employing construction methods that cause lesser impacts on people's construction works; preventive measures being passed by engineers of the project before implementation; - Paying compensation to any damages in case that proper preventive measures have not been taken. The value of compensations should make up the actual loss. - In case of incidents, cooperating with local authorities and affected people for compensation satisfactory to people. | PMU/ Consultant/ Monitoring engineer/ Subcontractor/ relevant departments |
| III. OPERATION PHASE | | |
| | Setting up operation targets and initiating the environmental monitoring program | Consultant/PMU/ DONRE |
| | Setting up reporting procedure and cooperating with the MORE | PMU/ DONRE |

| Pollution / impact | Act or solution | In charge |
|--------------------|---|---------------------------------|
| | Monitoring of impacts on society and community health in the surroundings of the project site | Monitoring consultant/PMU/DONRE |

6.2.2 Sensitive objects

The drainages will be built or upgraded in LIAs. Determination and analyses of sensitive objects in the vicinity of construction sites have been done, particularly the objects to which special attention is paid such as:

- (1) Schools
- (2) Hospitals and health centers
- (3) Religious sites
- (4) Offices and state administrations
- (5) Main restaurants and hotels
- (6) Gas stations
- (7) Other offices

In this project, results of investigation are as follows:

- **District 9:** Phuoc Long pagoda.
- **District 12:** Small pagodas, kindergartens, primary schools, Ba Diem junior high school, etc..
- **Thu Duc district:** Le Quy Don school, Linh Trung temple, Police Institute near zone TĐ.07.
- **Binh Thanh district:** Ba Chieu market
- **Phu Nhuan district:** a small pagoda.
- **Go Vap district:** Tu Dinh parish, Dinh market

Besides, some companies and enterprises in the zones to be upgraded will be more or less affected by construction activities in the project.

In order to lessen burdens for the entities mentioned above, subcontractors should incorporate their work schedules into the implementation plan of the project so as to meet requirements of sensitive objects, those include obtaining permits for activities in specific regions. Main features of that are have been discussed as follows

- (1) Administrative offices, premises of police, army and banks,
 - (a) Obtaining permits for inside and/or outside construction if required (applicable mostly to military camps)
 - (b) Notifying and observing to the time and period of construction
 - (c) Notifying guardians of activities, if required
- (2) Religious points (pagodas/temples and churches)
 - (a) Notifying and observing the time and period of construction
 - (b) Making proper passage
 - (c) Tidying up

- (3) Schools and kindergartens
 - (a) Notifying and observing the time and period of construction
 - (b) Making safe passages for children
 - (c) Minimizing mechanical activities
 - (d) Doing works with maximum care in order to reduce noise and dust.

6.2.3 Program of community information

Dissemination of information to communities necessitates cooperation of many parties in a systematic manners and with feedback mechanism. To obtain feedbacks, signposts and boards showing other basic information should be set up with at least addresses for communities to contact. Those basic information include names of the project, administration and subcontractors should be given in at least 2 visible boards in each construction site.

Local people should be informed in advance about impacts as well as possible changes in and influence on traffic. Upgrading and guidance of traffic should be widely notified in relevant regions. It is allowable to notice local people via ward representatives. During construction, it is allowable to inform updated information with loudspeakers in relevant zones.

Some principles that should be implemented include:

- People are informed in advance about construction locations and activities
- Propaganda about environmental awareness is started first in relevant entities, including of subcontractors' employees and a systematic approach is developed to keep communities well informed of construction activities.
- Information with communities as well as cooperation programs are done with a mechanism to receive feedbacks, comments and claims (for instance, a hot line to receive feedbacks)
- Meetings are held to discuss construction plans and schedules with families involving in business (and tourist services).

The feature of the project necessitates attempts of relevant parties. Requests should be discussed and cooperation is required for addressing any emerging matters with involving parties responsibilities clearly defined.

6.2.4 Responsibilities of parties in the construction phase

Ho Chi Minh City PC

Ho Chi Minh City PC shall manage administrative bodies of districts, the Service of Resources and Environment (SORE), Ho Chi Minh City Urban Traffic Management Body and the PMU.

HCM City SORE

Ho Chi Minh City SORE is represented the MORE for environmental management. It shall be monitoring the project and responsible for any infringement upon environmental

management and protection policies of Vietnam. This state body will also have an important role to play in assessment of any invisible change in designs that may cause environmental impacts.

Ho Chi Minh City Urban Traffic Authority

Ho Chi Minh City Urban Traffic Authority shall foster the PMU for responsibilities related to environmental management.

PMU

PMU shall be responsible for any recommendation for upgrading in the project so as to protect and maintain the environment. PMU shall be charged of management of environmental impacts and monitoring of the project in the construction phase. PMU shall also foster and coordinate countermeasures to be taken in the construction phase.

Monitoring engineer

Those engineers shall bear the main responsibility for monitoring the quality of works which are accomplished by subcontractors. They shall made key decisions on allocation of works, including assessment on the compliance of environmental protection regulations given in contracts, decisions on suspension of construction, on refusal of payment in case of breach of environmental protection clauses of contracts (methods, conditions, technical specifications, etc.).

Monitoring engineers in the project shall also monitor the countermeasures recommended in the environmental management programs. They shall include innovations in their regular reports as a part of their routine responsibilities.

Subcontractors

Subcontractor shall take countermeasures for environmental protection in the environmental management programs, including the measures to inhibit bad impacts on sensitive objects. Subcontractors should mandate engineers to check up the quality of site management related to the environmental management programs. The duties of checkup engineers include: ensuring that supervisors and workers have adequate understanding of relevant environmental management procedures, investigation, recordings and counsel of management of matters or latent environmental problems. Subcontractors shall submit quarterly reports to engineers. If engineers, PMU, WB, MORE, and Ho Chi Minh City PC state that a countermeasure is not efficient, subcontractors should provide more effective countermeasures.

Communities

Communities shall detect to avoid of or deal with unplanned or wrong investment activities that may affect quality of construction works and/or cause environmental pollution. Monitoring activities of communities in the project should follow by the Community Monitoring Programs on which the investor and localities have agreed.

6.2.5 Responsibilities in the operation phase

Ho Chi Minh City PC

Ho Chi Minh City shall administer administrative bodies of districts, the Service of Resources and Environment (SORE), Ho Chi Minh City Urban Traffic Management Body and the PMU.

6.2.6 Community relation

The Environmental Management Plan necessitates public information interaction right at the beginning of the construction in order to ensure that communities, which shall be informed about construction activities, receive information and feedback.

With respect to sensitive entities such as hospital, administrative offices, religious places, and schools, etc. many more specific requirements should be met, those include how to passages, noise, dust and safety. All requirements should be pondered and replied case by case such that construction activities are accomplished in the most effective manner. Receiving and replying to people's claims shall be a part of the works related to maintenance of the drainages (where communities play the role of alarming systems). In the campaign of information to specific communities, responsibilities of operation and maintenance should be informed.

6.2.7 Demand for training

The demand for training for described activities should be determined. Improving ability of environmental management program implementation should be incorporated with the development of mechanism – a bigger part in the project. The PMU (or other joint ventures) are recommended partaking training activities when required and suitable.

- PMU: the officers in charge of environmental matters shall be trained for environmental monitoring and reporting
- Subcontractors shall be trained how to monitor (noise and dust), to take countermeasures and to fill in monitoring reports.
- Communities: Community representatives shall be trained for monitoring and field watching of upgrading activities in construction and operation phases. Monitoring parameters (for instance, dust and noise) and observation points shall be selected in cooperation with the ones represented the PMU and the relevant community based on the monitoring program recommended.

6.2.8 Schedule for implementation

Schedules for implementation of the environmental monitoring program should match with the schedule of the project, for every period. Although the temporary schedules for implementation of environmental management programs are already given, a major part of time limits therein shall be adjusted after pondering and determining which contents shall be included in the time frame of the whole project.

6.3 ENVIRONMENTAL MONITORING PROGRAM

6.3.1 Environmental monitoring program of the project

The contents of the monitoring program include:

- Monitoring of characteristic parameters of air pollution and water pollution;
- Checkup of the implementation of countermeasures, mitigation of negative impacts on the environment and measures to control environmental pollution after the project is put into operation;
- Detections of risks of environmental deterioration to take countermeasures in due time;
- Checkup of efficiency of pollution treatment apparatuses and equipment;
- Determination of the strategy against pollution for protection of the environment.

Table 6.3 – Details of the environmental monitoring program

| Monitoring content | Frequency | Comparative standard | Number and position | Monitoring / implementation | Payer |
|---|---|--------------------------------------|---|--|--------------|
| I. PRE-CONSTRUCTION PHASE | | | | | |
| 1.1 Noise and air quality <u>Parameters:</u> - Noise (24-hour sampling) - Dust (24-hour sampling) - NOx - SOx - CO - THC - Microclimate | 02 courses, within one month before start of work | TCVN 5937:2005 TCVN 5938:2005 | 24 zones to be upgraded, 2 sampling points each | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 1.2 Water supply quality (8 parameters selected) | 01 course within one month before start of work | TCVN 5501-1991 | 24 zones to be upgraded, 1 sampling point each | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 1.3 Surface water quality (8 parameters selected) | 01 course within one month before start of work | TCVN 5942-1995 | 3 points on Vam Thuat canal | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| II. CONSTRUCTION PHASE | | | | | |
| 2.1 Checklist /auditing at construction sites: | Weekly or in case | Checklist/ auditing | All construction sites in 24 zones | Monitoring engineers and | 1. Monitorin |

| | | | | | |
|---|--|--------------------------------------|--|--|--|
| <ul style="list-style-type: none"> - Implementation of measures to control dust/air pollution, - Noise level, - Spillage of oil/hazardous waste, - Collection and storage of solid waste. - Overall sanitation | of any people's complaint | Yes/no questions | to be upgraded , throughout the construction periods of each zone. | Security, Environment and Health team (SEH) of Subcontractors | g consultant 2. Subcontractor in case of people's claim |
| 2.2 Noise and dust at construction sites (24h sampling) | Monthly or in case of any people's complaint | TCVN 5937:2005 TCVN 5949:1998 | 24 zones to be upgraded, 2 sampling points each, throughout the construction periods of each zone. | - <u>Monitoring</u> Monitoring consultant - <u>Performing:</u> <u>Supervise consultant for construction</u> or Subcontractor with functions of environmental monitoring | 1. Monitoring consultant 2. Subcontractor in case of people's claim |
| 2.3 Noise and air quality <u>Parameters:</u> <ul style="list-style-type: none"> - Noise - Dust - NOx - SOx - CO - THC - Microclimate | twice per year | TCVN 5937:2005 TCVN 5938:2005 | 24 zones to be upgraded, 2 sampling point each, throughout the construction periods of each zone. | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 2.4 Water supply quality: (8 parameters selected) | twice per year | TCVN 5501-1991 | 24 zones to be upgraded, 2 sampling points each, throughout the construction periods of each zone. | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 2.5 Wastewater at construction sites: <u>Parameters:</u> <ul style="list-style-type: none"> - pH - SS - COD - BOD5 - Oil and fat - T. Colifoms | twice per year | 5945:2005 (source C) | 24 zones to be upgraded, 1 sampling point each, throughout the construction periods of each zone. | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 2.6 Surface water (8 parameters selected) | twice per year | TCVN 5942-1995 | 3 points on Vam Thuat canal | - <u>Monitoring</u> PMU | PMU |

| | | | | | |
|--|--|--------------------------------------|--|--|-----|
| | | | during the construction in zone GV.02 | - <u>Performing:</u> Thang Long environment Company | |
| 2.7 Emissions: Sources in construction activities (generators, construction machines) | twice per year | TCVN 5939:2005 | In total, 5 pcs. of equipment /year x twice for all zones under construction | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| III. OPERATION PHASE AND MAINTENANCE | | | | | |
| 3.1 Noise and air quality <u>Parameters:</u> - Noise - Dust - NOx - SOx - CO - THC - Microclimate | twice per year (for 1 year after the project is put into operation) | TCVN 5937:2005 TCVN 5938:2005 | 24 zones to be upgraded, 1 sampling point for each zone | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 3.2 Water supply quality (8 parameters selected) | twice per year (for 1 years after the project is put into operation) | TCVN 5501-1991 | 24 zones to be upgraded, 1 sampling point for each zone | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 3.3 Wastewater at soakage pits: <u>Parameters:</u> - pH - SS - COD - BOD5 - Oil and fat - T. Colifoms | twice per year (for 1 years after the project is put into operation) | TCVN 6772:2000 (Level V) | 24 zones to be upgraded, 1 sampling point for each zone | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |
| 3.3 Surface water in Vam Thuat canal: <u>Parameters:</u> - pH - SS - COD - BOD5 - Oil and fat T. Colifoms | twice per year (for 1 years after the project is put into operation) | TCVN 5942:1995 | 03 sampling points on Vam Thuat canal | - <u>Monitoring</u> PMU - <u>Performing:</u> Thang Long environment Company | PMU |

6.3.2 The Environmental Management Plan of the community

In addition to the Environmental Monitoring Program to be developed by the investor, for activities of the project to reach the highest efficiency and cause the least impacts on the natural environment and people's living conditions, the Environmental Management Plan of the community is already prepared. The Environmental Management Plan of the community will be realized for people in the project site to involve in environmental monitoring tasks. Detailed contents of the program are given in **Table 6.4** and **Table 6.5**.

Table 6.4 - The Environmental Management Plan of the community in the construction phase

| Item | Content | Frequency | Method | In charge |
|--------------------------------|--|-------------|-------------|---|
| Upgrading water supply systems | Spoil: - Monitoring of storage and transport of spoil. - Monitoring of inundation/refuse at holes. | Once a week | Observation | Community representative (leader or nominee) |
| | Traffic jam: - Monitoring of traffic jam. - Monitoring of arrangement of equipment in the construction site | Daily | Observation | Community representative Households at the construction site. |
| | Society /safety: - Signboards, fences - Relationships between workers and inhabitants | Daily | Observation | Community representative Households at the construction site. |
| Upgrading drainage | Spoil: - Monitoring of storage and transport of spoil. - Monitoring of inundation/refuse at holes. | Once a week | Observation | Community representative (leader or nominee) |
| | Traffic jam: - Monitoring of traffic jam. - Monitoring of arrangement of equipment in the construction site | Daily | Observation | Community representative Household at the construction site. |
| | Wastewater: Monitoring of wastewater from the old drainage | Daily | Observation | Community representative Household at the construction site. |
| | Noise | Nighttime | Observation | Household at the construction site |
| | Society /safety: - Signboards, fences - Relationships between workers and inhabitants | Daily | Observation | Community representative Household at the construction site |
| ra di ng | Dust/emissions: - Smoke, emissions from | Daily | Observation | Community representative |

| | | | | |
|--|--|-----------|-------------|--|
| | construction machines - Dust emitted from the construction site | | | Household at the construction site. |
| | Noise | Nighttime | Observation | Household at the construction site |
| | Traffic jam: - Monitoring of traffic jam. - Monitoring of arrangement of equipment in the construction site | Daily | Observation | Community representative Household at the construction site. |

Table 6.5 - The Environmental Management Plan of the community in the operation phase (the first 3 years of operation)

| Item | Contents | Frequency | Method | In charge of implementation |
|---------------------------|---|---------------------------------|------------------------|---|
| Water supply | Water quality | Daily | Observation | Households |
| | | In case of suspecting pollution | Sampling and analyzing | Community representatives in cooperation with functional bodies of districts. |
| | Water pressure | Daily | Observation | Households |
| Drainage | Accumulative mud: accumulation of mud in soakage pits | once every six months | Observation | Community representative |
| | Choke of drains | once every week | Observation | Community representative Households |
| Collection of solid waste | Collection and transport of refuse from households | Daily | Observation | Community representative Households |
| | Collection of refuse in public sites | Daily | Observation | Functional bodies of wards |
| Alley | - Traffic density - Traffic accidents | Daily | Observation | Community representative Households |
| Air quality | Dust/emissions from vehicles | Daily | Observation | Households |
| | | once every 6 months | Quick measurement | Functional bodies of districts |
| | Noise | Daily | Observation | Households |
| | | once every 6 months | Quick measurement | Functional bodies of districts |

CHAPTER 7

ESTIMATE EXPENDITURE FOR ENVIRONMENTAL WORKS

7.1 ESTIMATE FOR ENVIRONMENTAL PROTECTION

The estimate for environmental protection expenditure in the projects of tertiary infrastructure facilities like the project is very difficult to put in because the main impacts of the project exist in the construction phase, and effective pollution control necessitate application of various managerial and technical measures. However, based on experiences from other packages of the project, the environmental protection expenditure of the project can be estimated as shown in *Table 7.1*.

Table 7.1 – Estimate of environmental protection expenditure of the project

| No. | WORK ITEM | ESTIMATE |
|-------------------------------------|--|--|
| <i>I. In the construction phase</i> | | |
| 01 | Taking all measures and employing facilities to control pollution due to dust and noise, providing work protection utilities for workers in construction sites | VND50 million/year for each zone to be upgraded. |
| 02 | - Control of pollution due to sanitary wastewater: Providing movable restrooms or leasing houses for the same purpose. - Providing pumps for sucking wastewater. | VND40 million/year for each zone to be upgraded |
| 03 | Control of pollution due to solid waste and hazardous waste: - Providing covered refuse tanks, 240 L each - Collecting sanitary waste within a day - Managing hazardous waste | VND20 million/year for each zone to be upgraded. |
| <i>II. In the operation phase</i> | | |
| 04 | Building drainage meeting standards as designed for draining. Encouraging families to build restrooms as regulated and to connect to common sewers. | Expenditure for this items is included in the investment in the project. |
| 05 | Control of solid waste pollution: Providing covered refuse tanks at the zones to be upgraded in the project (200 L each,) | Expenditure for this items is included in the investment in the project. |

7.2 ESTIMATE FOR IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAM

The expenditure for implementation of the environmental management program of the project is shown in *Table 7.2* and *Table 7.3*.

Table 7.2 – Expenditure for implementation of the environmental management program

| Monitoring contents | Unit price | Number and position | Total |
|---|-----------------------------|--|-------------|
| I. PRE-CONSTRUCTION PHASE | | | |
| 1.1 Monitoring of noise and air quality Parameters: | | | |
| - Noise (24-hour sampling) | VND 1,200,000 /sample | 2 points x 24 zones x twice | 115,200,000 |
| - Dust (24-hour sampling) | VND 1,200,000/ sample | 2 points x 24 zones x twice | 115,200,000 |
| - NO _x , SO _x , CO, THC - Microclimate | VND 600,000 /sample | 2 points x 24 zones x twice | 57,600,000 |
| 1.2 Water supply quality: (8 parameters selected) | VND 800,000 /sample | 1 point x 24 zones x once | 19,200,000 |
| 1.3 Surface water quality: (8 parameters selected) | VND 800,000 /sample | 3 points x twice | 4,800,000 |
| II. CONSTRUCTION PHASE | | | |
| 2.1 Checklist/auditing at construction site. | - | - | |
| 2.2 Noise and dust in construction sites (24h sampling) | VND 1,200,000 /sample | 2 points x 24 zones x 12 times per year | 691,200,000 |
| 2.3 Monitoring of noise and air quality - Dust, NO _x , SO _x , CO, THC - Microclimate - Noise, vibration | VND 600,000 /sample | 2 points x 24 zones x 2 times/year | 57,600,000 |
| 2.4 Water supply quality: | VND 800,000 /sample | 1 point x 24 zones x 2 times/year | 38,400,000 |
| 2.5 Wastewater at construction sites: Parameters: pH, SS, COD, BOD ₅ , Oil and fat, T. Colifoms | VND 900,000 /sample | 1 point x 24 zones x 2 times/year | 43,200,000 |
| 2.6 Surface water (8 parameters) | VND 800,000 /sample | 3 points x 2 times/year | 4,800 |
| 2.6 Emissions: in construction (generators, construction machines) | VND 3,000,000 /sample | Total 5 for all construction sites x twice per year | 30,000,000 |
| III. OPERATION PHASE (FIRST 3 YEARS) | | | |
| 3.1 Monitoring of noise and air quality Parameters: Noise, Dust, NO _x , SO _x , CO, THC, Microclimate | VND 700,000 /sample | 1 point x 24 zones x twice per year | 33,600,000 |
| 3.2 Water supply quality (8 parameters selected) | VND 800,000 /sample | 1 point x 24 zones x twice per year | 38,400,000 |
| 3.3 Wastewater at soakage | VND 900,000 | 1 point x 24 zones x twice | 43,200,000 |

| | | | |
|---|------------------------|---------------------------|-----------|
| pits: Parameters: pH, SS, COD, BOD5, Oil and fat, T. Colifoms | /sample | per year | |
| 3.4 Water quality (8 parameters selected) | VND 800,000 /sample | 3 points x twice per year | 4,800,000 |

Table 7.3 – Estimate for environmental training

| Course | Times | Duration | Attendants | Unit price | Total |
|--|-----------------------------------|---------------|----------------------------|------------------|---------------------------|
| PMU: environmental control and reporting | Once | 1 day | 2 | VND 5 million | VND 5 million |
| Subcontractor: application of countermeasures | Once for each subcontractor | Half a day | 5 | VND 5 million | VND 5 million |
| Community: site monitoring and control | Once | 1 day | 50 people x 6 districts | VND 4 million | VND 24 million |
| Total | | | | | VND 34 million |

CHAPTER 8

COMMUNITY COUNSEL

Circular 08/2006/TT-BTNMT dated 08 September 2006 by the MORE on *Guidelines on strategic environmental assessment, environmental impact assessment and undertaking for environmental protection*; Paragraph 2, Part III set forth regulations on community counsel in EIA, in details, it means counsel with the PCs of wards/communes and the Fatherland Front (FF) units of wards/communes where the project take place.

In compliance with the aforementioned regulations, the PMU of Ho Chi Minh City Urban Upgrading Project as the investor send the dispatch (attached with an outline of the project, its environmental impacts and countermeasures that the project will take), asking for opinions of the PCs and FFs of the wards in the project site (namely Wards 2, 11, 15 – Binh Thanh district; Ward 5 – Go Vap district; Wards 7, 8, 17 – Phu Nhuan district; Binh Tho, Linh Tay, Linh Dong, Linh Chieu wards – Thu Duc district; Phuoc Long A ward – District 9; and Tan Thoi Nhat ward, Dong Hung Thuan, Thanh Loc – District 12). And the PCs and FFs of those wards replied in writing (*See dispatches attached in Annex*). Contents of the replies in writing are summarized as follows.

8.1 Ward 2, Binh Thanh district

1/- Opinions of the PC of Ward 2, Binh Thanh district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the PC found in addition of pollution due to dust generated in the transport of materials and waste matters from construction sites, there will be some matters such as (i) gathered materials may be create condition for epidemics such as petechial fever. Therefore, the PMU should make plans and cooperate with local medical stations for treatment; (ii) Noise: Operations of machines will certainly produce noise and people will sympathize yet the PMU should study to minimize the production of noise that may affect living activities of the local community. In general, possible problems are anticipated in the report but those opinions should be added in. In addition to environmental matters, there will be social problems in case that some workers stay in construction sites.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, the PC found it relatively good. However, monitoring of the community is not only involved households and representatives of residential blocks but also the system of people's inspectors in every block; it should be cooperated with local authorities to be introduced with people to perform the functions of community monitoring as guided by the city authorities.

2/- Opinions of the Fatherland Front of Ward 2, Binh Thanh district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the FF states that the project should pay attention to the following matters: (i) On transporting construction materials (sand and stone), trucks should be covered up to avoid of drips and drips and the project should be ready to deal with any aftermath thereof; (ii) Construction should in done in roll-up manner with completion of one section before moving to another, i.e. not extending the site indefinitely and affecting the local living conditions and environment; (iii) Monitoring boards should

be set up in all construction sites with the participation of local people and members of the FF.

- Opinions about environmental management plans of the community: the FF agrees on the Environmental Management Plans of the community in the construction and operation phases. However, instruments to check up noise, dust and smoke should be added and questions related to countermeasure, duration and aftermath, responsible people, telephone numbers of divisions, people in charge of treatment of those pollutants.

8.2 Ward 15, Binh Thanh district

1/- Opinions of the PC of Ward 15, Binh Thanh district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the PC found:

- Regarding environmental impacts:
 - + Dust pollution: in the site of construction.
 - + Pollution due to solid waste: because of littering by households or guests with poor awareness.
 - + Pollution of canals: canals may be choked as a result of construction, leaving trouble water, offensive smell and quick reproduction of mosquito.
 - + Pollution due to spillage of wastewater since households have no drainage to sewers.
- Recommendations of mitigation measures:
 - + The district supports for dredging canals and sewers.
 - + People's inspectors of wards enhance checkup and decisively treat cases of infringement causing environmental pollution.

- Opinions about environmental management plans of the community: The ward PC is recommended planning monthly propaganda and mobilization of people for environmental hygiene protection; and ordering the managements residential blocks to set up teams for environmental checkup and treatment, to commend and reward examples of good abidance and participation in environmental hygiene protection.

2/- Opinions of the Fatherland Front of Ward 15, Binh Thanh district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the PC found in addition of pollution due to dust generated in the transport of materials and waste matters from construction sites, there will be some matters such as (i) gathered materials may be create conditions for epidemics such as petechial fever. Therefore, the PMU should make plans and cooperate with local medical stations for treatment; (ii) Noise: Operations of machines will certainly produce noise and people will sympathize yet the PMU should study to minimize the production of noise that may affect living activities of the local community. In general, possible problems are anticipated in the report but those opinions should be added in. In addition to environmental matters, there will be social problems in case that some workers stay in construction sites.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, the PC found it relatively good. However, monitoring of the community is not only involved households and representatives of residential blocks but also the system of people's inspectors in every block; it should be cooperated with local authorities to be introduced with people to perform the functions of community monitoring as guided by the city authorities.

8.3 Ward 5, Go Vap district

1/- Opinions of the PC of Ward 5, Go Vap district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the PC of Ward 5 agreed on dust pollution and countermeasures applicable to the ward. Besides, the PC has some opinions as follows: Since alleys are narrow, it would be better to use delivery tricycles or light trucks (1 – 1.5 ton) in transport which should be covered up; Spoil should be moved out immediately because it may produce offensive smell because pollution of Tham Luong canal has adsorbed to soil, and at the same time the site should be restore to return passages; construction activities should not be as late as 9:00 PM because at the residential areas, most people are laborers and pupils and that is the rest time essential for them; traffic jams are inevitable but it would be better not to do any construction activities in rush hours; wastewater should be collected because there is no specific drain for it.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, the Ward PC fully agrees on the countermeasures recommended by the PMU.

2/- Opinions of the Fatherland Front of Ward 5, Go Vap district

- Opinions about environmental matters resulted from activities of the project: After viewing the summary of the EIA report, the FF recommends that the project should ensure that the existence of smoke, dust, spoil, etc. will not be so long as to affect local people.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, it is recommended to listen to people's opinions so as not to cause big impacts on people and the construction quality should be high.

8.4 Ward 15, Go Vap district

1/- Opinions of the PC of Ward 15, Go Vap district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the PC of Ward 15 agreed on dust pollution and countermeasures applicable to the ward. Besides, the PC has some opinions as follows: Since alleys are narrow, it would be better to use delivery tricycles or light trucks (1 – 1.5 ton) in transport which should be covered up; Spoil should be moved out immediately because it may produce offensive smell because pollution of Tham Luong canal has adsorbed to soil, and at the same time the site should be restore to return passages; construction activities should not be as late as 9:00 PM because at the residential areas, most people are laborers and pupils and that is the rest time essential for them; traffic jams

are inevitable but it would be better not to do any construction activities in rush hours; wastewater should be collected because there is no specific drain for it.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, the Ward PC fully agrees on the countermeasures recommended by the PMU.

2/- Opinions of the Fatherland Front of Ward 15, Go Vap district

- Opinions about environmental matters resulted from activities of the project: After viewing the summary of the EIA report prepared by the PMU of the Urban Upgrading Project, Part II: main environmental impacts and pollution control measures, the Ward PC agrees on environmental assessment, from impacting scope to countermeasures applicable in various stages of construction. It is essential to take measures as recommended.

With respect to localities, the FF is responsible for mobilizing people to partake in construction for common benefits for people and the community.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, the Ward FF agrees on the contents given by the PMU.

8.5 Ward 12, Go Vap district

1/- Opinions of the PC of Ward 12, Go Vap district

- Opinions about environmental matters resulted from activities of the project:

Considering the summary of the EIA report, the PC of Ward 4 found that:

- Pertaining to location: The project site is a LIA with alleys linking to main roads of the district and the city, i.e. Quang Trung – Phan Huy Ich near crossroads and Cho Cau bridge. Therefore transport of materials should receive special attention in order to avoid of traffic jams in main roads. Temporary passages should be defined before upgrading of alleys is accomplished. Passages should be restored at the soonest to ensure convenience for people in alleys. Fences surrounding construction sites should be maintained.
- Dust pollution: suitable construction machines should be employed to mitigate environmental pollution. Machines that produce emissions should be arranged far from houses; machines to be used should meet standards on emission; warehouses for materials should be covered up not to emit dust to the environment; watering should be done when necessary.
- Pollution due to wastewater: on upgrading drainages, attention should be paid to sanitary wastewater of households. Digging for laying drains should be done so as not to lead to water flowing over roads
- Time: Rest times for residential areas in noon and night should be secured.

- Opinions about environmental management plans of the community: the PC of Ward 14 recommends the community representative board to send people to partake in monitoring of the upgrading of drainages and alleys.

2/- Opinions of the Fatherland Front of Ward 12, Go Vap district

- Regarding environmental problems due to activities of the project: During construction, the project will cause some impacts on the environment as well as people's living quality, those include dust, smoke, emissions, noise, and traffic obstruction. Therefore the investor should have alternatives and take countermeasures to secure environmental hygiene. The investor should be noticed that: Roadmaps for vehicles to transport materials and machines during the construction should be designed to restrict activities in rush hours and rest times to ensure traffic and people's rest. Covering canvas should be used during transport to avoid of drips and drops. Temporary passages should be set up so as not to affect people's living activities.

- Regarding the Environmental Management Plan of the community: It is recommended organizing community representative boards, implementing the Environmental Management Plan in the project site and checking the investor's compliance of regulations as well as negative environmental impacts during the construction phase and when facilities are put into operation.

8.6 Ward 7, Phu Nhuan district

1/- Opinions of the PC of Ward 7, Phu Nhuan district

- Regarding environmental matters due to activities of the project: the PC agrees on the summary of the EIA. It is required that during construction, measures applicable to deal with high water and rain water should be available because the region of Ward 7, Phu Nhuan district is relatively low.

- The Environmental Management Plan of the community: The PC agrees on the summary of basic contents of the EIA report. It is recommended to implement the basic contents of the EIA report.

2/- Opinions of the Fatherland Front of Ward 7, Phu Nhuan district

- We agree on official predictions, levels of pollution and countermeasures (such as dust pollution and temporary traffic obstruction). It is necessary to add in pollution due to flooding tide (in the region of Ward 07, Phu Nhuan district). Countermeasures should be using pumps to suck wastewater during construction and transferring it to proper places for treatment to avoid of environmental pollution.

- We agree on the Environmental Management Plan of the community:

- The Environmental Management Plan of the community in the construction phase (including items, contents, frequency, methods, and responsible parties).
- The following items are agreed: upgrading water supply, drainages and alleys.
- The item that should be added: wastewater treatment facility, and pumps for use during flood tide.
- The part "responsible for implementation", "responsible for monitoring" should be: implemented by the representatives for the community investment monitoring board (members including representatives for residential blocks and some others appointed by local people).

- People should know the telephone numbers of the PMU for the Urban Upgrading Project (of the people who directly manage the construction sites), of the investor, as well as addresses, office telephone numbers, and mobile phone numbers of the people who directly responsible for the sites under construction.

8.7 Ward 8, Phu Nhuan district

1/- Opinions of the PC of Ward 8, Phu Nhuan district

- Opinions about environmental matters resulted from activities of the project: Considering the summary of basic contents of the EIA report, we require full implementation of suitable steps for protection of the environment inside and out of construction sites in order to limit nuisance to people; limiting impacts of environmental pollution, noise or any other matters that may emerge due to the subcontractors' methods of construction. In details, proper measures should be taken so as not to emit dust, noise, vibration, and lights higher than the allowable limits; Construction materials should be transported with technically guaranteed methods, not to cause environmental pollution.

- Opinions about environmental management plans of the community: the PC recommends propaganda and mobilization for local people to be responsible for protection of environmental hygiene.

2/- Opinions of the Fatherland Front of Ward 8, Phu Nhuan district

- Opinions about environmental matters resulted from activities of the project: at present, Ward 8 is gathering households' opinions. In practice, there is no construction activity in the site year and we will ponder any emerging matters in due time and notice the PMU for taking countermeasures.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, we have no more opinion about the summary of the EIA report.

8.8 Linh Chieu ward, Thu Duc district

1/- Opinions of the PC of Linh Chieu ward, Thu Duc district

- Opinions about environmental matters resulted from activities of the project: The PC of Linh Chieu ward agrees on the pollution control measures recommended by the PMU.

- Opinions about environmental management plans of the community: the PC agrees on the recommended plan.

2/- Opinions of the Fatherland Front of Linh Chieu ward, Thu Duc district

- Opinions about environmental matters resulted from activities of the project: The FF of Linh Chieu ward agrees on predictions of impacts and countermeasures recommended for mitigating environmental pollution.

- Opinions about environmental management plans of the community: the FF agrees on the contents and the Environmental Management Plan of the community given in the summary.

8.9 Linh Tay ward, Thu Duc district

1/- Opinions of the PC of Linh Tay ward, Thu Duc district

Opinions about environmental problems and community: Construction should be carried out shortly after site clearance with no accumulation of spoil and rubble on road faces. Dust, smoke and noise should be minimized during construction.

2/- Opinions of the Fatherland Front of Linh Tay ward, Thu Duc district

- Opinions about environmental matters: Considering the summary, the FF of Linh Tay ward requires controlling pollution due to emissions from construction machines. Road faces and sidewalks should not be used for storing materials, rubble and noise, dust, wastewater should be limited.

- Opinions about community upgrading: People should be mobilized for involving in environmental protection and management of construction works.

8.10 Phuoc Long A ward, District 9

1/- Opinions of the PC of Phuoc Long A ward, District

- Opinions about environmental matters resulted from activities of the project: Countermeasures to air pollution and traffic jam in the construction phase that the consultant has recommended are suitable. In the operation phase, sanitation measures with people's awareness and propaganda by community representative boards that the consultant has given can be used.

- Opinions about environmental management plans of the community: The community representative boards in the zones to be upgraded will mobilize people to implement the measures recommended.

2/- Opinions of the Fatherland Front of Phuoc Long A ward, District 9

- Opinions about environmental matters resulted from activities of the project: Considering the summary of basic contents of the EIA report, we agree on prediction of some environmental impacts during implementation of the project.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, we agree on the contents and the Environmental Management Plan of the community given in the summary.

8.11 Tan Thoi Nhat ward, District 12

1/- Opinions of the PC of Tan Thoi Nhat ward, District 12

- Pertaining to the environmental matters due to activities of the project: we agree on the summary of the EIA report prepared by the PMU. The PMU is recommended installing signposts at the sites under construction. Transport of spoil should ensure environmental hygiene.

- Regarding the Environmental Management Plan of the community: we agree on the Environmental Management Plan of the community proposed by the PMU.

2/- Opinions of the Fatherland Front of Tan Thoi Nhat ward, District 12

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, we agree on the contents of countermeasures recommended. During construction, boards showing the works should be installed to inform details such as names of the investor, subcontractors, monitoring consultant, duration, date of completion, etc. The implementation of those countermeasures should be regularly checked.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, we agree on the Environmental Management Plan of the community in the summary of the EIA report.

8.12 Dong Hung Thuan ward, District 12

1/- Opinions of the PC of Dong Hung Thuan ward, District 12

- Pertaining to environmental matters due to activities of the project: we agree on the recommended measures for pollution control. However, it would be better develop activities in the roll-up manner, alley by alley, not to develop too many construction sites in the same period because that affect living activities of populated areas and the environment.

- Regarding the Environmental Management Plan of the community: It is recommended adding the task of traffic jam monitoring with the support of local police in the sites under construction.

2/- Opinions of the Fatherland Front of Dong Hung Thuan ward, District 12

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the FF of Dong Hung Thuan found recommended pollution control measures suitable and relatively good. It is recommended not extending the duration of construction so as not to affect people's living activities. Regular checkup of implementation of those measures is recommended.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, we agree on contents and the Environmental Management Plan of the community that are given in the summary of the EIA report. It necessitates transparent implementation and mobilization for people to take part.

8.13 Tan Hung Thuan ward, District 12

1/- Opinions of the PC of Tan Hung Thuan ward, District 12

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the FF of Tan Hung Thuan ward agrees on countermeasures. However, it is recommended not extending the duration of construction so as not to affect people's living activities. Regular checkup of implementation of those measures is also recommended. Local inundation should be avoided.

- Opinions about environmental management plans of the community: It is found through investigation that some households affected by the upgrading project cannot afford removal and the PMU is therefore recommended to provide guidance for supporting them. Considering assessment of impacts and countermeasures, we have opinions as mentioned above and the PMU is recommended cooperating with other bodies for implementation of the recommended measures.

2/- Opinions of the Fatherland Front of Tan Hung Thuan ward, District 12

- Opinions about environmental matters resulted from activities of the project: Considering the summary of the EIA report, the FF of Dong Hung Thuan ward found the recommended pollution control measures suitable. However, it is recommended not extending the duration of construction so as not to affect people's living activities. Regular checkup of implementation of those measures is also recommended.

- Opinions about environmental management plans of the community: Regarding the Environmental Management Plan of the community, we agree on the contents, the Environmental Management Plan of the community given in the summary of the EIA report. It necessitates transparent implementation and mobilization for people to take part.

8.14 Thanh Loc ward, District 12

1/- Opinions of the PC of Thanh Loc ward, District 12

- Pertaining to environmental matters due to activities of the project: Steps of transport and gathering materials and construction will be causative of dust impacts on the environment. Installation of culverts should be done with flood tide taken into account and one-way valves should be used, otherwise the project site will be locally inundated.

- Regarding the Environmental Management Plan of the community: Covering canvas should be used during transport and gathering of materials and construction should be done together with measures to limit damages to the environment. Studies into tidal regime are essential because the construction site is 0.8 to 1 m lower than the highest tidal level.

2/- Opinions of the Fatherland Front of Thanh Loc ward, District 12

- Environmental problems: Functional bodies should plan for maintenance of alleys, dredging canals, collection of refuse, and dealing with infringing entities. Monitoring organs of communities should frequently monitor and report to the FF and authorities in

due time, functional bodies should take measures to deal with infringement related to the environment.

- Regarding the Environmental Management Plan of the community: The ward PC and managements of residential blocks are recommended frequently checking and dealing with infringing entities and individuals. The ward FF will set up monitoring organs of community to cooperate with subcontracts in proposing measures to address negative impacts on the environment. People should be mobilized for involving in environmental protection.

CHAPTER 9

INDICATIONS OF DATA SOURCES, DATA AND METHODS FOR ASSESSMENT

9.1 SOURCES OF DATA AND DOCUMENTS

9.1.1 Sources of reference materials

1. Prof. PhD Le Trinh – Environmental impact assessment– methods and application – Science and Technology Publisher, 2000.
2. MSc Nguyen Duy Dong – Ventilation and treatment of emissions – Education Publisher, 1999.
3. Ass. Prof. PhD Nguyen Xuan Nguyen – Effluent and technology for treatment of gaseous wastes – Hanoi Science and Technology Publisher, 2004.
4. WB & WHO. IPC Modeling – Decision Support System for Integrated Pollution Control version 2.0. 1998.
5. Ho Chi Minh City meteo-hydrological monitoring data. The Southern Meteo-Hydrology Center, 2006.
6. Report on air environment quality monitoring of Ho Chi Minh City, 2006
7. Report on water quality monitoring, the environmental monitoring network of Ho Chi Minh City, 2006.
8. Study into perfection of biological parameters for quality evaluation, zoning and classification of water courses in Ho Chi Minh City (Vietnam Institute for Environment and Sustainable Development).
9. WHO. Environmental technology series. Assessment of sources of air, water, and land pollution. A Guide to rapid source inventory techniques and their use in formulating environmental control strategies - Part I and II. 1993.
10. Handbook for Environmental Engineering, Shun Dar Lin, Illinois State Water Survey, Peoria, Illinois, 2005.
11. *Air Emissions inventory 2005*, General Michell International Airport Air Reserve Station, Milwaukee, WI, February 2006.
12. WB. Environmental Source Book Vol. 1, 2, 3. Washington D.C, 1991
13. World Bank. Environmental Source Books – Guidelines for Environmental Assessment, 1991
14. WB. Environmental Source Book Vol. 1, 2, 3. Washington D.C, 1991
15. Mitsubishi – Nippon Cement – VCC. EIA Report of the Nghison Cement Plant at Thanhhoa, Conducted by Le Trinh et al, 1994, 145 pages
16. WB & WHO. IPC Modeling – Decision Support System for Integrated Pollution Control version 2.0. 1998.

17. WHO. Environmental technology series. Assessment of sources of air, water, and land pollution. A Guide to rapid source inventory techniques and their use in formulating environmental control strategies - Part I and II. 1993.

9.1.2 Sources of data and documents established by the investor

1. Preliminary report on community upgrading plans (CUPs) at the LIAs in 06 districts 9, 12, Go Vap, Binh Thanh, Phu Nhuan, Thu Duc by Saigon Weico, 2006.
2. Report on completion of step 1 (determining the demand for upgrading LIAs, community counsel and preparation of preliminary CUPs for LIAs selected in the region) in 06 districts: 9, 12, Go Vap, Binh Thanh, Phu Nhuan, Thu Duc by Saigon Weico, 2006.
3. Data of baseline environment, group 2 – TV1 in 24 suitable LIAs in 14 wards of 6 districts in the project, i.e. 9, 12, Go Vap, Binh Thanh, Phu Nhuan, Thu Duc by Saigon Weico, 2006.
4. Data of the state of the environment in the project site by CEECO, 2007

9.2 METHODS USED IN EIA

9.2.1 Methods used in EIA

In the preparation of this EIA, we have referred, studies and use some methods as follows:

▪ Site study:

- This method is a way to get information quickly and accurately though its results are qualitative more than quantitative. It helps to know which parameters should be measured and monitored.
- Based on experiences of investigators, who are in fact environment experts, judgment is another method used for predicting future impacts when the project enters the operation phase. Through desk work, technical and managerial officers can define exactly negative impacts and mitigation measures.
- This method was applied in the investigation into the zones to be upgraded from September to October 2007. Contents of the investigation include:
 - Investigation of natural, socio-economic conditions and infrastructure facilities as well as the state of the environment in the project site, etc..
 - Observation of zones to be upgraded with visual findings recorded.
 - Collection and summarization of data and documents related to the project site.

- **Laboratory analysis:** taken samples are analyzed in laboratories of CEECO by means of advanced instruments in order to obtain good results (analyzing methods and instruments will be given hereunder).

- **Handling of statistic data:** both obtained data and analyzing data are handled with statistical algorithms in the Microsoft Excel software, those include average, median, standard deviation, etc.). The data collected or measured for the report such as data

related to the states of the environment and socio-economy, quantities of work items in the project are also handled with Microsoft Excel.

- **Comparison:** This is to assess the quality of the environment and discharge flows by comparing with relevant environmental standards and other standards set forth by the MOH. In other words, based on data obtained from measurement and analyses, the state of environment (water, air, etc.) is compared with relevant environmental standards and the MOH's standards for assessment.

- **Identification:**

- Description of the environmental system.
- Determination of the project components that may affect the environment.
- This method is used in the project in order to define the discharge flows and relevant environmental matters for detailed assessment and recommendation of mitigation measures applicable to each case of the project.

- **Rapid assessment:**

This is based on the EIA method of the World Health Organization. It is highly effective in computation of pollution loads and assessment on impacts of pollution sources. It is very useful in EIA, particularly in the cases where concrete parameters for calculation cannot be defined.

With this method, it is possible to determine the load and average concentration of pollutants for each activity of the project without measurement/analysis.

In addition to application for quickly evaluating water/air pollution loads of activities of the project, this method helps predict the levels of environmental impacts due to transfer of wastewater to water sources and emission to a certain area.

- **Expertise:**

Based on environmental science understanding and experiences, CEECO experts discussed and gave out assessment and mitigation measures to the negative impacts, of which activities of the project may be causative.

- **GIS:**

- This method use tools and software such as GPS, MapInfo, and Arcview...
- GIS is used in positioning the sampling points (water, air samples, etc.) in the project site so as to ensure tat they correctly show the state of environment therein.

9.2.2 Sampling and analyzing methods for each parameter

Sampling methods, parameters and technique and analyzing methods applied to some parameters of the air environment are as follows:

Table 9.1 – Parameters, sampling and analyzing methods applied to the air environment

| Parameter | Technical specification of sampling instrument | Sampling method | | Analyzing method | |
|-----------------|---|------------------------|--|------------------------|--|
| | | TCVN | Method | TCVN | Method |
| Noise | Quest 2900 (USA) Measuring limits: 20 dB to 140 dB | 5964-1995 5965-1995 | - Measuring duration: 10 minutes - Integrate noise levels are recorded. | 5949-1998 | Print out results via connection Quest 2900 a printer |
| Vibration | Rion VM-83 (JAPAN) Measuring limit: 0.0001 to 1000m/s ² Frequency: 1Hz to 10kHz | 6963-2001 | - Measuring duration: 10 minutes - Reading value: average of 10 highest accelerations out of 100 readings (each value is measured for 5 second) | 6962-2001 6963-2001 | Reading and calculating in accordance with TCVN 6963-2001 |
| Dust | Staplex (USA) Air sampling with high flow rate. Flow rate coefficient: 0 - 2 CMM | 5067-1995 | - Sampling in 20 minutes - Inflow rate: 0.5 m ³ /minute - Filter paper GC-50 - Size 100mm | 5067-1995 | Determining content of suspended solid in the air by weight |
| SO ₂ | SKC 224-PCXR8 (USA) Sampling pump: | 5971-1995 | - Sampling in 30 minutes - Inflow rate: 1L/minute - Adsorbent: TCM (HgCl ₂ , KCl, EDTA) | 5971-1995 | Determining sulfur dioxide concentration with Tetrachloromercurate (TCM)/Pararosanilin |
| NO ₂ | Universal Flow rate coefficient: 0 - 5 l/m Time display: LCD showing sampling duration | 6137-1996 | - Sampling in 30 minutes - Inflow rate 1L/minute - Adsorbent: NH ₂ C ₆ H ₄ SO ₂ .2HCl + HOOC(CHOH) ₂ COOH + (HOOCCH ₂)N(CH ₂) ₂ N(CH ₂ COONa) ₂ .2H ₂ O | 6137-1996 | Analyzing method based on modified Griess – Saltzman method. |
| CO | | 52 TCN 352-89 MOH | - Sampling in 10 minutes - Inflow rate 4 L/minute - Adsorbent: PdCl ₂ | 52 TCN 352-89 MOH | Adsorption with PdCl ₂ /colorimetry |

Sampling instruments and analyzing methods applied to parameters of the water environment are as follows:

Table 9.2 –Parameters and instruments for analyzing water samples

| No. | Parameter | Instrument | Applied standard |
|-----|--|---|---------------------|
| 1 | Turbidity | Hanna – HI93703 (ITALY) Scale: 0.00 to 50.00FTU/ 50 to 1000 FTU Resolution: 0.01/FTU Accuracy: +/- 0.5 FTU or +/- 5% | In situ measurement |
| 2 | pH | Sper scientific 850081 (USA) Scale: 0 – 14 Resolution: 0.01 Accuracy: +/- (0.02PH+2d) | In situ measurement |
| 3 | Dissolved oxygen (DO) | Sper scientific 850081 (USA) Scale: 0 – 20 Resolution: 0.1 Accuracy: +/- 0.4 | In situ measurement |
| 4 | Total dissolved solid (TDS) | Sper scientific 850081 (USA) Scale: PPM 132 – 13200 Resolution: 1 or 10 Accuracy: +/- (3%fs+1d) | In situ measurement |
| 5 | Alkalinity | Titration | TCVN 6636-1:2000 |
| 6 | Acidity | Titration | APHA 1999 |
| 7 | Suspended solid (SS) | Photometer | TCVN 4560:1988 |
| 8 | Ammonia (NH ₄ ⁺) | UV spectrographUV-VIS | TCVN 6179-96 |
| 9 | Nitrate (NO ₃ ⁻) | UV spectrographUV-VIS | TCVN 6180-96 |
| 10 | Nitrite (NO ₂ ⁻) | UV spectrographUV-VIS | TCVN 6178-96 |
| 11 | Organic nitrogen | UV spectrographUV-VIS | AOAC-2000 |
| 12 | Phosphate (PO ₄ ³⁻) | UV spectrographUV-VIS | TCVN 6202-96 |
| 13 | Chemical oxygen demand (COD) | Oxidation using K ₂ Cr ₂ O ₇ in acidic medium and titration with ferrous ammonium sulfate; using Hg ₂ SO ₄ to avoid of influence by Cl ⁻ in case of low COD and high chlorides. | TCVN 6491:1999 |
| 14 | Biological oxygen demand (BOD ₅ ²⁰) | Incubation and pressure measurement by means of a specific instrument named BOD Trak. | TCVN 6001:1995 |
| 15 | Chlorides (Cl ⁻) | UV spectrograph | TCVN 6194:1996 |
| 16 | Phenols | UV spectrograph | TCVN 6216:96 |
| 17 | Oil and fat | IR spectrograph | TCVN 5070-1995 |
| 18 | Lead (Pb) | Atomic adsorption spectrograph | SMEWW3113-Pb-1995 |
| 19 | Mercury (Hg) | Atomic adsorption spectrograph | SMEWW3112-Hg-1995 |

| No. | Parameter | Instrument | Applied standard |
|-----|------------------------------|--------------------------------|--------------------|
| 20 | Cadmium (Cd) | Atomic adsorption spectrograph | SMEWW3113-Cd-1995 |
| 21 | Chromium (Cr ³⁺) | Atomic adsorption spectrograph | SMEWW 3500-Cr-1995 |
| 22 | Arsenic (As) | Atomic adsorption spectrograph | SMEWW3114-As-1995 |
| 23 | E.Coli | Test tube | ISO9308-2:1990 |
| 24 | T.Coliform | Test tube | ISO9308-2:1990 |
| 25 | Chloride pesticides | Gaseous chromatography | AOAC 1995 |
| 26 | Phosphate pesticide P | Gaseous chromatography | AOAC 1995 |

Note:

- TCVN: Vietnamese standard
- APHA: American Public Health Association
- AOAC: Association of Official Analytical Chemists
- SMEWW: Standard Methods for the Examination of Water and Wastewater

9.2.2 Rating the reliability of the methods used

With the methods used for the project, the reliability is given in Table 9.1.

Table 9.1 – Summary of reliability of methods used

| NO. | METHOD | RELIABILITY | REASON |
|-----|---|-------------|---|
| 1 | Site study including in situ sampling and lab analyses | High | Novel and advanced sampling and analyzing equipment |
| 2 | Handling of statistic data | Medium | This method provides qualitative or semi-quantitative evaluation. It contains many subjective factors of the evaluating people, depending on conventional perception dictated by feeling on significance, level, and points given to parameters. Subjective estimates of evaluating people are dissolved in the total result and therefore not easy to analyze. There are therefore some limits in summarization of impacts and comparison with results from various methods. |
| 3 | Identification and comparison | High | Analyzing results have high reliability |
| 4 | Rapid assessment based on pollution coefficients of the World Health Organization (WHO) | Medium | This is based on the pollution coefficients established by the World Health Organization which do not tally with the specific conditions in Vietnam |
| 5 | Expertise | High | This is based on experiences of experts |

| | | | |
|---|-------------------|------|---|
| 7 | GIS | High | This is based on prevailingly used software |
| 8 | Community counsel | High | This is based of official onions in writing of the PCs and FFs of the wards where the project will be implemented |

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the study and assessment in details of environmental impacts of the Urban Upgrading Project, Component 1, the consultant drew some conclusions as follows:

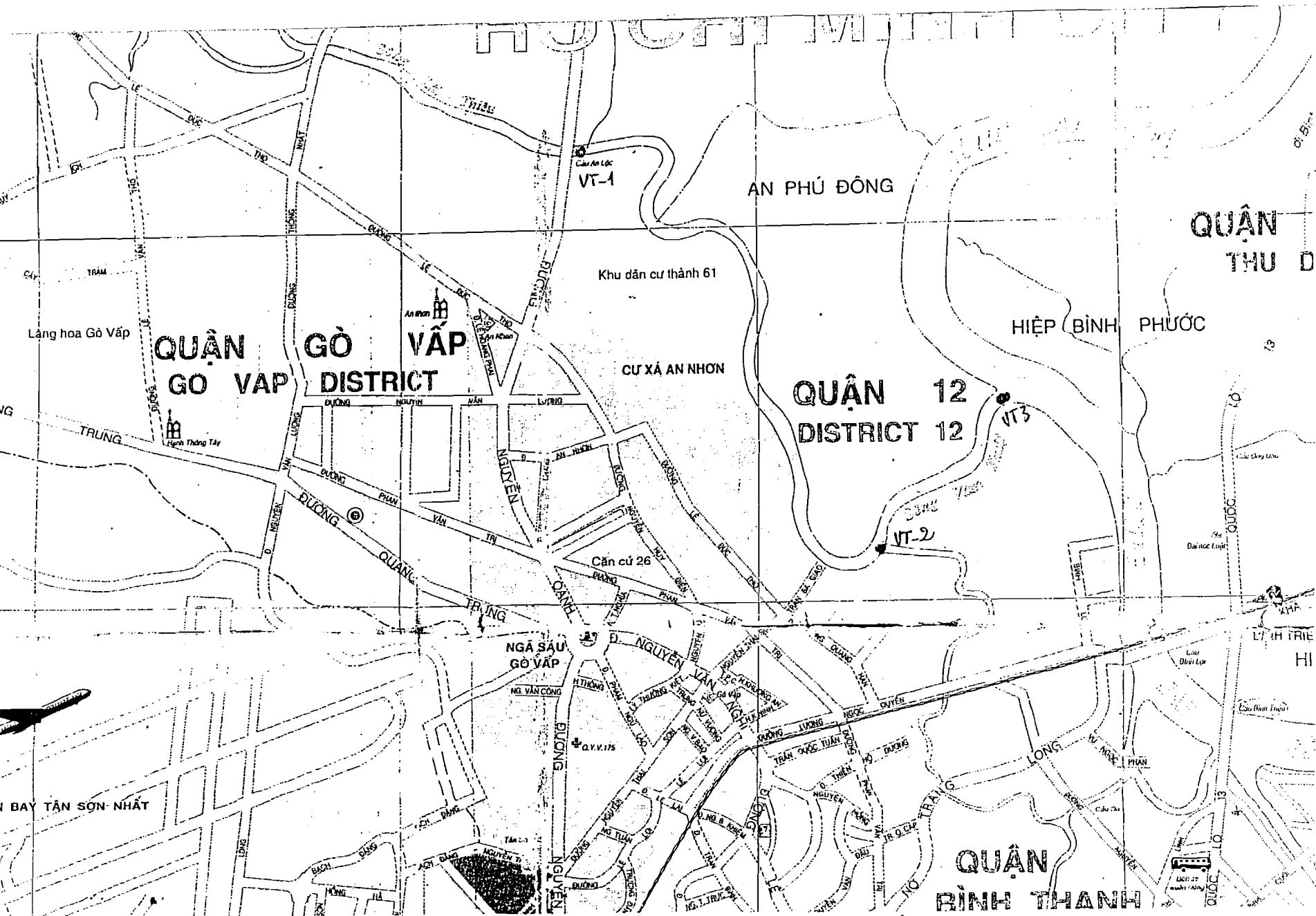
1. On completion, the project will make significant contribution into stabilization of people's living, political security and social discipline and order of the zones in particularly and Ho Chi Minh City in general.
2. Upgrading of LIAs is not only economically feasible but also helpful in improvement of living conditions and the environment of the zones in future.
3. The construction and long-term operation of the project are causative of some socio-economic and environmental negative impacts if there is no measure to prevent, control and treat environmental pollution.
4. The operation of the project will affect some conditions at the present yet they are assessed as inconsiderable when compared with the benefits to be brought in.
5. Starting from full awareness of responsibility in environmental protection, the project will invest sufficiently in environmental protection activities and undertake to seriously realize the plans for prevention, control and treatment of environmental pollution as given in this EIA report so as to meet all the Vietnamese Environmental Standards as regulated, those include:
 - Plan for control of air pollution in the construction phase
 - Plan for draining rain water and wastewater and treatment of wastewaters in both construction and operation phases
 - Plan for control of pollution due to solid wastes in both construction and operation phases
6. The PMU will cooperate with functional bodies in the processes of technical design and construction in order to meet the environmental standards as regulated as well as avoid of environmental incidents.
7. Measures to control pollution and restrict negative impacts of the project on the environment, which have been recommended in this EIA report, are feasible to meet valid Vietnamese Environmental Standards.

RECOMMENDATIONS

For the project to be implemented soon, the PMU hereby requests Ho Chi Minh City Service of Resources and Environment and relevant state bodies to examine and approve of the EIA reports in order to keep the progress of investment into the project, which will in turn bring in actual benefits for the socio-economic growth of the project site in particular and Ho Chi Minh City in general.

ANNEX

LOCATIONS OF SAMPLING OF SURFACE WATER QUALITY



QUẬN GÒ VẤP DISTRICT

QUẬN 12 DISTRICT 12

QUẬN THU D

QUẬN BÌNH THẠNH

AN PHÚ ĐÔNG

HIỆP BÌNH PHƯỚC

Khu dân cư thành 61

CƯ XÁ AN NHƠN

Căn cứ 26

NGÀ SÀU GÒ VẤP

Làng hoa Gò Vấp

BIÊN BAY TẬN SƠN NHẤT

Các An Lạc VT-1

VT-2

VT-3

0° 51' 4"

106° 40' 0"

106° 40' 0"

0° 51' 4"

106° 40' 0"

0° 51' 4"

106° 40' 0"

0° 51' 4"

VIETNAMESE STANDARD

1. TCVN 5937:2005. Tiêu chuẩn Việt Nam. Chất lượng không khí – tiêu chuẩn chất lượng không khí xung quanh

Giá trị giới hạn các thông số cơ bản trong không khí xung quanh qui định trong bảng 1.

Bảng 1: Tiêu chuẩn chất lượng không khí xung quanh.

| Đơn vị: Microgam trên mét khối ($\mu\text{g}/\text{m}^3$) | | | | | |
|---|------------------|------------------|-------------------|------------------------------------|---|
| Thông số | Trung bình 1 giờ | Trung bình 8 giờ | Trung bình 24 giờ | Trung bình năm (Trung bình số học) | Phương pháp xác định |
| SO ₂ | 350 | - | 125 | 50 | Pararosalin hoặc huỳnh quang cực tím |
| CO | 30000 | 10000 | - | - | Quang phổ hồng ngoại không phân tán (NDIR) |
| NO ₂ | 200 | - | - | 40 | Huỳnh quang hoá học pha khí |
| O ₃ | 180 | 120 | 80 | - | Trắc quang tử ngoại |
| Bụi lơ lửng (TSP) | 300 | - | 200 | 140 | Lấy mẫu thể tích lớn Phân tích khối lượng |
| Bụi # 10 μm (PM10) | - | - | 150 | 50 | Phân tích khối lượng hoặc tách quán tính |
| Pb | - | - | 1,5 | 0,5 | Lấy mẫu thể tích lớn và quang phổ hấp thụ nguyên tử |
| <p>CHÚ THÍCH: PM10: Bụi lơ lửng có kích thước khí động học nhỏ hơn hoặc bằng 10μm; Dấu gạch ngang (-): Không quy định</p> | | | | | |

2. TCVN 5942-1995: Chất lượng nước - Tiêu chuẩn chất lượng nước mặt
Giá trị giới hạn cho phép của các thông số và nồng độ các chất ô nhiễm trong nước mặt

| TT | Thông số | Đơn vị | Giá trị giới hạn | |
|----|---|------------|------------------|-----------|
| | | | A | B |
| 1 | pH | - | 6 đến 8,5 | 5,5 đến 9 |
| 2 | BOD ₅ (20 ⁰ C) | mg/l | < 4 | < 25 |
| 3 | COD | mg/l | < 10 | < 35 |
| 4 | Oxy hoà tan | mg/l | ≥ 6 | ≥ 2 |
| 5 | Chất rắn lơ lửng | mg/l | 20 | 80 |
| 6 | Asen | mg/l | 0,05 | 0,1 |
| 7 | Bari | mg/l | 1 | 4 |
| 8 | Cadimi | mg/l | 0,01 | 0,02 |
| 9 | Chi | mg/l | 0,05 | 0,1 |
| 10 | Crom (VI) | mg/l | 0,05 | 0,05 |
| 11 | Crom (III) | mg/l | 0,1 | 1 |
| 12 | Đồng | mg/l | 0,1 | 1 |
| 13 | Kẽm | mg/l | 1 | 2 |
| 14 | Mangan | mg/l | 0,1 | 0,8 |
| 15 | Niken | mg/l | 0,1 | 1 |
| 16 | Sắt | mg/l | 1 | 2 |
| 17 | Thủy ngân | mg/l | 0,001 | 0,002 |
| 18 | Thiếc | mg/l | 1 | 2 |
| 19 | Amoniac (tính theo N) | mg/l | 0,05 | 1 |
| 20 | Florua | mg/l | 1 | 1,5 |
| 21 | Nitrat (tính theo N) | mg/l | 10 | 15 |
| 22 | Nitrit (tính theo N) | mg/l | 0,01 | 0,05 |
| 23 | Xianua | mg/l | 0,01 | 0,05 |
| 24 | Phenola (tổng số) | mg/l | 0,001 | 0,02 |
| 25 | Dầu, mỡ | mg/l | không | 0,3 |
| 26 | Chất tẩy rửa | mg/l | 0,5 | 0,5 |
| 27 | Coliform | MPN/100 ml | 5000 | 10 000 |
| 28 | Tổng hoá chất bảo vệ thực vật (trừ DDT) | mg/l | 0,15 | 0,15 |
| 29 | DDT | mg/l | 0,01 | 0,01 |
| 30 | Tổng hoạt độ phóng xạ α | Bq/l | 0,1 | 0,1 |
| 31 | Tổng hoạt độ phóng xạ β | Bq/l | 1,0 | 1,0 |

Chú thích:

- Cột A áp dụng đối với nước mặt có thể dùng làm nguồn cấp nước sinh hoạt (nhưng phải qua quá trình xử lý theo quy định).

-Cột B áp dụng đối với nước mặt dùng cho các mục đích khác. Nước dùng cho nông nghiệp và nuôi trồng thủy sản có quy định riêng.

3. TCVN 5944-1995: Chất lượng nước - Tiêu chuẩn chất lượng nước ngầm.

Giá trị giới hạn cho phép của các thông số và nồng độ các chất ô nhiễm trong nước ngầm.

| TT | Thông số | Đơn vị | Giá trị giới hạn |
|----|--|------------|------------------|
| 1 | pH | | 6,5 đến 8,5 |
| 2 | Màu | Pt - Co | 5 đến 50 |
| 3 | Độ cứng (tính theo CaCO ₃) | mg/l | 300 đến 500 |
| 4 | Chất rắn tổng hợp | mg/l | 750 đến 1500 |
| 5 | Arsen | mg/l | 0,05 |
| 6 | Cadimi | mg/l | 0,01 |
| 7 | Clorua | mg/l | 200 đến 600 |
| 8 | Chi | mg/l | 0,05 |
| 9 | Crom (VI) | mg/l | 0,05 |
| 10 | Xianua | mg/l | 0,01 |
| 11 | Đồng | mg/l | 1,0 |
| 12 | Florua | mg/l | 1,0 |
| 13 | Kẽm | mg/l | 5,0 |
| 14 | Mangan | mg/l | 0,1 đến 0,5 |
| 15 | Nitrat | mg/l | 45 |
| 16 | Phenola | mg/l | 0,001 |
| 17 | Sắt | mg/l | 1 đến 5 |
| 18 | Sunfat | mg/l | 200 đến 400 |
| 19 | Thủy ngân | mg/l | 0,001 |
| 20 | Selen | mg/l | 0,01 |
| 21 | Fecal coli | MPN/100 ml | Không |
| 22 | Coliform | MPN/100 ml | 3 |

4. TCVN 5949: 1998. Âm học - Tiếng ồn khu vực công cộng và dân cư

Mức ồn tối đa cho phép

Bảng 1 - Giới hạn tối đa cho phép tiếng ồn khu vực công cộng và dân cư (theo mức âm tương đương)

Đơn vị : dB(A)

| TT | Khu vực (*) | Thời gian | | |
|----|--|---------------|----------------|---------------|
| | | Từ 6h đến 18h | Từ 18h đến 22h | Từ 22h đến 6h |
| 1 | Khu vực cần đặc biệt yên tĩnh: Bệnh viện, thư viện, nhà điều dưỡng, nhà trẻ, trường học, nhà thờ, chùa chiền. | 50 | 45 | 40 |
| 2 | Khu dân cư, khách sạn, nhà nghỉ, cơ quan hành chính. | 60 | 55 | 50 |
| 3 | Khu dân cư xen kẽ trong khu vực thương mại, dịch vụ, sản xuất. | 75 | 70 | 50 |

5. TCVN 6438 : 2001: Phương tiện giao thông đường bộ – Giới hạn lớn nhất cho phép của khí thải.

| Thành phần gây ô nhiễm trong khí thải | Phương tiện lắp động cơ xăng | | | | | | Phương tiện lắp động cơ diesel | | |
|---------------------------------------|------------------------------|-------|-------|-------|--------|-------|--------------------------------|-------|-------|
| | Ô tô | | | | Mô tô | | Ô tô | | |
| | Mức 1 | Mức 2 | Mức 3 | Mức 4 | Mức 1 | Mức 2 | Mức 1 | Mức 2 | Mức 3 |
| CO (% thể tích) | 6,5 | 6,0 | 4,5 | 3,5 | 6,0 | 4,5 | - | - | - |
| Hoặc (ppm thể tích) | | | | | 10.000 | 7.800 | | | |
| Động cơ 4 thì | | 1500 | 1200 | 600 | | | | | |
| Động cơ 2 thì | | 7800 | 7800 | 7800 | | | | | |
| Động cơ có kết cấu khác | | 3300 | 3300 | 3300 | | | | | |
| Độ khói (% HUS) | | | | | | | 85 | 72 | 50 |

6. TCVN 5939:2005. Tiêu chuẩn Việt Nam Chất lượng không khí – Tiêu chuẩn khí thải công nghiệp đối với bụi và các chất vô cơ

Bảng 1 – Giới hạn tối đa cho phép của bụi và các chất vô cơ trong khí thải công nghiệp

Đơn vị: miligam trên mét khối khí thải chuẩn* (mg/Nm³)

| TT | Thông số | Giá trị giới hạn | |
|----|---|------------------|------|
| | | A | B |
| 1 | Bụi khối | 400 | 200 |
| 2 | Bụi chứa silic | 50 | 50 |
| 3 | Amoniac và các hợp chất amoni | 76 | 50 |
| 4 | Antimon và hợp chất, tính theo Sb | 20 | 10 |
| 5 | Asen và hợp chất, tính theo As | 20 | 10 |
| 6 | Cadmi và hợp chất, tính theo Cd | 20 | 5 |
| 7 | Chì và hợp chất, tính theo Pb | 10 | 5 |
| 8 | CO | 1000 | 1000 |
| 9 | Clo | 32 | 10 |
| 10 | Đồng và hợp chất, tính theo Cu | 20 | 10 |
| 11 | Kẽm và hợp chất, tính theo Zn | 30 | 30 |
| 12 | HCl | 200 | 50 |
| 13 | Flo, HF, hoặc các hợp chất vô cơ của Flo, tính theo HF | 50 | 20 |
| 14 | H ₂ S | 7,5 | 7,5 |
| 15 | SO ₂ | 1500 | 500 |
| 16 | NO _x , tính theo NO ₂ | 1000 | 580 |
| 17 | NO _x (cơ sở sản xuất axit), tính theo NO ₂ | 2000 | 1000 |
| 18 | Hơi H ₂ SO ₄ hoặc SO ₃ , tính theo SO ₃ | 100 | 50 |
| 19 | Hơi HNO ₃ (cơ sở sản xuất axit), tính theo NO ₂ | 2000 | 1000 |
| 20 | Hơi HNO ₃ (các nguồn khác), tính theo NO ₂ | 1000 | 500 |

CHÚ THÍCH:

*) Mét khối khí thải chuẩn nói trong tiêu chuẩn này là một mét khối khí thải ở nhiệt độ 0°C và áp suất tuyệt đối 760 mm thủy ngân.

7. TCVN 5940:2005. TIÊU CHUẨN VIỆT NAM. Chất lượng không khí – Tiêu chuẩn khí thải công nghiệp đối với một số chất hữu cơ

Cơ quan có thẩm quyền chỉ định.

Bảng 1 – Giới hạn tối đa cho phép các chất hữu cơ khi thải vào không khí

Đơn vị: Miligam trên mét khối khí thải chuẩn (mg/Nm³)

| TT | Tên | Số CAS ²⁾ | Công thức hóa học | Giới hạn tối đa |
|----|----------------------|----------------------|---|-----------------|
| 1 | Axetylen tetrabromua | 79-27-6 | CHBr ₂ CHBr ₂ | 14 |
| 2 | Axetaldehyd | 75-07-0 | CH ₃ CHO | 270 |
| 3 | Acrolein | 107-02-8 | CH ₂ =CHCHO | 2,5 |
| 4 | Amylaxetat | 628-63-7 | CH ₃ COOC ₅ H ₁₁ | 525 |
| 5 | Anilin | 62-53-3 | C ₆ H ₅ NH ₂ | 19 |
| 6 | Benzidin | 92-87-5 | NH ₂ C ₆ H ₄ C ₆ H ₄ NH ₂ | KPHĐ |
| 7 | Benzen | 71-43-2 | C ₆ H ₆ | 5 |
| 8 | Benzyl clorua | 100-44-7 | C ₆ H ₅ CH ₂ Cl | 5 |
| 9 | 1,3-Butadien | 106-99-0 | C ₄ H ₆ | 2200 |
| 10 | n-Butyl axetat | 123-86-4 | CH ₃ COOC ₄ H ₉ | 950 |
| 11 | Butylamin | 109-73-9 | CH ₃ (CH ₂) ₂ CH ₂ NH ₂ | 15 |
| 12 | Creson | 1319-77-3 | CH ₃ C ₆ H ₄ OH | 22 |
| 13 | Clorbenzen | 108-90-7 | C ₆ H ₅ Cl | 350 |
| 14 | Clorofom | 67-66-3 | CHCl ₃ | 240 |
| 15 | â-clopren | 126-99-8 | CH ₂ =CClCH=CH ₂ | 90 |
| 16 | Clopicrin | 76-06-2 | CCl ₃ NO ₂ | 0,7 |
| 17 | Cyclohexan | 110-82-7 | C ₆ H ₁₂ | 1300 |
| 18 | Cyclohexanol | 108-93-0 | C ₆ H ₁₁ OH | 410 |
| 19 | Cyclohexanon | 108-94-1 | C ₆ H ₁₀ O | 400 |
| 20 | Cyclohexen | 110-83-8 | C ₆ H ₁₀ | 1350 |
| 21 | Dietylamin | 109-89-7 | (C ₂ H ₅) ₂ NH | 75 |
| 22 | Diflodibrommetan | 75-61-6 | CF ₂ BR ₂ | 860 |
| 23 | o-diclobenzen | 95-50-1 | C ₆ H ₄ Cl | 300 |
| 24 | 1,1-Dicloetan | 75-34-3 | CHCl ₂ CH ₃ | 400 |
| 25 | 1,2-Dicloetylen | 540-59-0 | ClCH=CHCl | 790 |
| 26 | 1,4-Dioxan | 123-91-1 | C ₄ H ₈ O ₂ | 360 |

| | | | | |
|----|---------------------------|------------|---------------------|------|
| 27 | Dimetylanilin | 121-69-7 | $C_6H_5N(CH_3)_2$ | 25 |
| 28 | Dicloetyl ete | 111-44-4 | $(ClCH_2CH_2)_2O$ | 90 |
| 29 | Dimetylfomamit | 68-12-2 | $(CH_3)_2NOCH$ | 60 |
| 30 | Dimetylsunfat | 77-78-1 | $(CH_3)_2SO_4$ | 0,5 |
| 31 | Dimetylhydrazin | 57-14-7 | $(CH_3)_2NNH_2$ | 1 |
| 32 | Dinitrobenzen | 25154-54-5 | $C_6H_4(NO_2)_2$ | 1 |
| 33 | Etylaxetat | 141-78-6 | $CH_3COOC_2H_5$ | 1400 |
| 34 | Etylamin | 75-04-7 | $CH_3CH_2NH_2$ | 45 |
| 35 | Etylbenzen | 100-41-4 | $CH_3CH_2C_6H_5$ | 870 |
| 36 | Etylendiamin | 74-96-4 | C_2H_5Br | 890 |
| 37 | Etylacrilat | 107-15-3 | $NH_2CH_2CH_2NH_2$ | 30 |
| 38 | Etylendibromua | 106-93-4 | $CHBr = CHBr$ | 190 |
| 39 | Etylacrilat | 140-88-5 | $CH_2 = CHOOC_2H_5$ | 100 |
| 40 | Etylen clohydrin | 107-07-3 | CH_2ClCH_2OH | 16 |
| 41 | Etylen oxyt | 75-21-8 | CH_2OCH_2 | 20 |
| 42 | Etyl ete | 60-29-7 | $C_2H_5OC_2H_5$ | 1200 |
| 43 | Etyl clorua | 75-00-3 | CH_3CH_2Cl | 2600 |
| 44 | Etylsilicat | 78-10-4 | $(C_2H_5)_4SiO_4$ | 850 |
| 45 | Etanolamin | 141-43-5 | $NH_2CH_2CH_2OH$ | 45 |
| 46 | Fufural | 98-01-1 | C_4H_3OCHO | 20 |
| 47 | Fomaldehyt | 50-00-0 | $HCHO$ | 20 |
| 48 | Fufuryl (2-furylmethanol) | 98-00-0 | $C_4H_3OCH_2OH$ | 120 |
| 49 | Flotriclometan | 75-69-4 | CCl_3F | 5600 |
| 50 | n-Heptan | 124-82-5 | C_7H_{16} | 2000 |
| 51 | n-Hexan | 110-54-3 | C_6H_{14} | 450 |
| 52 | Isopropylamin | 75-31-0 | $(CH_3)_2CHNH_2$ | 12 |
| 53 | n-butanol | 71-36-3 | $CH_3(CH_2)_3OH$ | 360 |
| 54 | Metyl mercaptan | 74-93-1 | CH_3SH | 15 |
| 55 | Metylaxetat | 79-20-9 | CH_3COOCH_3 | 610 |
| 56 | Metylacrylat | 96-33-3 | $CH_2 = CHCOOCH_3$ | 35 |
| 57 | Metanol | 67-56-1 | CH_3OH | 260 |
| 58 | Metylaxetylen | 74-99-7 | $CH_3C = CH$ | 1650 |
| 59 | Metylbromua | 74-83-9 | CH_3Br | 80 |
| 60 | Metylcyclohexan | 108-87-2 | $CH_3C_6H_{11}$ | 2000 |

| | | | | |
|----|------------------------|------------|--|------|
| 61 | Metylcyclohexanol | 25639-42-3 | $\text{CH}_3\text{C}_6\text{H}_{10}\text{OH}$ | 470 |
| 62 | Metylcyclohexanon | 1331-22-2 | $\text{CH}_3\text{C}_6\text{H}_9\text{O}$ | 460 |
| 63 | Metylclorua | 74-87-3 | CH_3Cl_2 | 210 |
| 64 | Metylen clorua | 75-09-2 | CH_2Cl_2 | 1750 |
| 65 | Metyl clorofom | 71-55-6 | CH_3CCl_3 | 2700 |
| 66 | Monometylanilin | 100-61-8 | $\text{C}_6\text{H}_5\text{NHCH}_3$ | 9 |
| 67 | Metanolamin | 3088-27-5 | HOCH_2NH_2 | 31 |
| 68 | Naphtalen | 91-20-3 | C_{10}H_8 | 150 |
| 69 | Nitrobenzen | 98-95-3 | $\text{C}_6\text{H}_5\text{NO}_2$ | 5 |
| 70 | Nitroetan | 79-24-3 | $\text{CH}_3\text{CH}_2\text{NO}_2$ | 310 |
| 71 | Nitroglycerin | 55-63-0 | $\text{C}_3\text{H}_5(\text{ONO}_2)_3$ | 5 |
| 72 | Nitrometan | 75-52-5 | CH_3NO_2 | 250 |
| 73 | 2-Nitropropan | 79-46-9 | $\text{CH}_3\text{CH}(\text{NO}_2)\text{CH}_3$ | 1800 |
| 74 | Nitrotoluen | 1321-12-6 | $\text{NO}_2\text{C}_6\text{H}_4\text{CH}_3$ | 30 |
| 75 | 2-Pentanom | 107-87-9 | $\text{CH}_3\text{CO}(\text{CH}_2)_2\text{CH}_3$ | 700 |
| 76 | Phenol | 108-95-2 | $\text{C}_6\text{H}_5\text{OH}$ | 19 |
| 77 | Phenylhydrazin | 100-63-0 | $\text{C}_6\text{H}_5\text{NHNH}_2$ | 22 |
| 78 | n-Propanol | 71-23-8 | $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ | 980 |
| 79 | n-Propylaxetat | 109-60-4 | $\text{CH}_3\text{-COO-C}_3\text{H}_7$ | 840 |
| 80 | Propylendiclorua | 78-87-5 | $\text{CH}_3\text{-CHCl-CH}_2\text{Cl}$ | 350 |
| 81 | Propylenoxyt | 75-56-9 | $\text{C}_3\text{H}_6\text{O}$ | 240 |
| 82 | Pyridin | 110-86-1 | $\text{C}_5\text{H}_5\text{N}$ | 30 |
| 83 | Pyren | 129-00-0 | $\text{C}_{16}\text{H}_{10}$ | 15 |
| 84 | p-Quinon | 106-51-4 | $\text{C}_6\text{H}_4\text{O}_2$ | 0,4 |
| 85 | Styren | 100-42-5 | $\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$ | 100 |
| 86 | Tetrahydrofural | 109-99-9 | $\text{C}_4\text{H}_8\text{O}$ | 590 |
| 87 | 1,1,2,2-tetraclöetan | 79-34-5 | $\text{Cl}_2\text{HCCHCl}_2$ | 35 |
| 88 | Tetraclöetylen | 127-18-4 | $\text{CCl}_2=\text{CCl}_2$ | 670 |
| 89 | Tetraclömetan | 56-23-5 | CCl_4 | 65 |
| 90 | Tetracnitrometan | 509-14-8 | $\text{C}(\text{NO}_2)_4$ | 8 |
| 91 | Toluen | 108-88-3 | $\text{C}_6\text{H}_5\text{CH}_3$ | 750 |
| 92 | o-Toluidin | 95-53-4 | $\text{CH}_3\text{C}_6\text{H}_4\text{NH}_2$ | 22 |
| 93 | Toluen-2,4-diisocyanat | 584-84-9 | $\text{CH}_3\text{C}_6\text{H}_3(\text{NCO})_2$ | 0,7 |
| 94 | Trietylamin | 121-44-8 | $(\text{C}_2\text{H}_5)_3\text{N}$ | 100 |

| | | | | |
|-----|------------------|------------|---|------|
| 95 | 1,1,2-Tricloetan | 79-00-5 | CHCl ₂ CH ₂ Cl | 1080 |
| 96 | Trietylamin | 79-01-6 | ClCH=CCl ₂ | 110 |
| 97 | Xylen | 1330-20-7 | C ₆ H ₄ (CH ₃) ₂ | 870 |
| 98 | Xylidin | 1300-73-8 | (CH ₃) ₂ C ₆ H ₃ NH ₂ | 50 |
| 99 | Vinylclorua | 75-01-4 | CH ₂ =CHCl | 20 |
| 100 | Vinyltoluen | 25013-15-4 | CH ₂ =CHC ₆ H ₄ CH ₃ | 480 |

CHÚ THÍCH:

1) Mét khối khí thải chuẩn nói trong tiêu chuẩn này là một mét khối khí thải ở điều kiện nhiệt độ 0^{0C} và áp suất tuyệt đối 760mm thủy ngân.

2) Số CAS: Số đăng ký hóa chất theo quốc tế (Chemical Abstracts Service Registry Number) dùng để phân định các hóa chất.

8. TCVN 5945:2005. Tiêu chuẩn Việt nam. Nước thải công nghiệp – Tiêu chuẩn thải

Bảng 1 – Giá trị giới hạn các thông số và nồng độ các chất ô nhiễm trong nước thải công nghiệp.

| TT | Thông số | Đơn vị | Giá trị giới hạn | | |
|----|-------------------------|--------|------------------|----------------|---------|
| | | | A | B | C |
| 1 | Nhiệt độ | °C | 40 | 40 | 45 |
| 2 | pH | - | 6 đến 9 | 5,5 đến 9 | 5 đến 9 |
| 3 | Mùi | - | Không khó chịu | Không khó chịu | - |
| 4 | Màu sắc, Co-Pt ở pH=7 | | 20 | 50 | - |
| 5 | BOD ₅ (20°C) | mg/l | 30 | 50 | 100 |
| 6 | COD | mg/l | 50 | 80 | 400 |
| 7 | Chất rắn lơ lửng | mg/l | 50 | 100 | 200 |
| 8 | Asen | mg/l | 0,05 | 0,1 | 0,5 |
| 9 | Thủy ngân | mg/l | 0,005 | 0,01 | 0,01 |
| 10 | Chì | mg/l | 0,1 | 0,5 | 1 |
| 11 | Cadimi | mg/l | 0,005 | 0,01 | 0,5 |
| 12 | Crom (IV) | mg/l | 0,05 | 0,1 | 0,5 |
| 13 | Crom (III) | mg/l | 0,2 | 1 | 2 |
| 14 | Đồng | mg/l | 2 | 2 | 5 |
| 15 | Kẽm | mg/l | 3 | 3 | 5 |
| 16 | Niken | mg/l | 0,2 | 0,5 | 2 |
| 17 | Mangan | mg/l | 0,5 | 1 | 5 |
| 18 | Sắt | mg/l | 1 | 5 | 10 |

| | | | | | |
|----|---|-----------|--|------|------|
| 19 | Thiếc | mg/l | 0,2 | 1 | 5 |
| 20 | Xianua | mg/l | 0,07 | 0,1 | 0,2 |
| 21 | Phenol | mg/l | 0,1 | 0,5 | 1 |
| 22 | Dầu mỡ khoáng | mg/l | 5 | 5 | 10 |
| 23 | Dầu động thực vật | mg/l | 10 | 20 | 30 |
| 24 | Clo dư | mg/l | 1 | 2 | - |
| 25 | PCBs | mg/l | 0,003 | 0,01 | 0,05 |
| 26 | Hóa chất bảo vệ thực vật: Lân hữu cơ | mg/l | 0,3 | 1 | |
| 27 | Hóa chất bảo vệ thực vật: Clo hữu cơ | mg/l | 0,1 | 0,1 | |
| 28 | Sunfua | mg/l | 0,2 | 0,5 | 1 |
| 29 | Florua | mg/l | 5 | 10 | 15 |
| 30 | Clorua | mg/l | 500 | 600 | 1000 |
| 31 | Amoni (tính theo Nitơ) | mg/l | 5 | 10 | 15 |
| 32 | Tổng nitơ | mg/l | 15 | 30 | 60 |
| 33 | Tổng phôtpho | mg/l | 4 | 6 | 8 |
| 34 | Coliform | MPN/100ml | 3000 | 5000 | - |
| 35 | Xét nghiệm sinh học (Bioassay) | | 90% cá sống sót sau 96 giờ trong 100% nước thải | | - |
| 36 | Tổng hoạt độ phóng xạ á | Bq/l | 0,1 | 0,1 | - |
| 37 | Tổng hoạt độ phóng xạ â | Bq/l | 1,0 | 1,0 | - |

RESULTS OF INVESTIGATION OF PUBLIC OPINIONS

QUẬN BÌNH THẠNH
ỦY BAN NHÂN DÂN
PHƯỜNG 2

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Số: 139/UBND

Phường 2, ngày 17 tháng 1 năm 2007.

Về việc tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP.

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh.

Theo công văn số: 669/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của ban Quản lý dự án nâng cấp Đô thị Thành phố Hồ Chí Minh về việc “ Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2 ” Dự án nâng cấp đô thị. Ủy Ban Nhân Dân phường 2 có ý kiến sau:

1. Ý kiến các vấn đề môi trường do hoạt động dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, chúng tôi nhận thấy ngoài việc ô nhiễm do các loại bụi từ việc vận chuyển các loại vật tư, chất thải từ công trường còn có các vấn đề phát sinh như sau:

- Việc tập kết vật tư có thể là điều kiện phát sinh các loại dịch bệnh: Sốt xuất huyết, BQL dự án nên có kế hoạch cùng y tế địa phương để xử lý.

Tiếng ồn: Khi vận hành máy móc chắc chắn sẽ gây ra tiếng ồn, BQL dự án cũng nên nghiên cứu hạn chế đến mức thấp nhất việc phát sinh tiếng ồn làm ảnh hưởng đến sinh hoạt của cộng đồng địa phương.

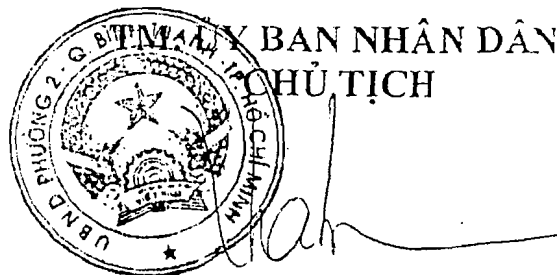
Nhìn chung, các vấn đề có thể xảy ra trong báo cáo đã thể hiện khá chi tiết. Tuy nhiên ngoài các vấn đề môi trường còn có các vấn đề xã hội kèm theo nếu như công trình có người ở.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng.

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi nhận thấy khá chặt chẽ. Tuy nhiên, việc giám sát tại cộng đồng không phải chỉ có hộ gia đình và đại diện khu phố; nên có hệ thống thanh tra nhân dân được phân bố tại từng khu phố; nên có sự phối hợp với chính quyền địa phương để được giới thiệu nhân sự thực hiện đúng chức năng giám sát của cộng đồng theo hướng dẫn của thành phố.

Nơi nhận:

- Như trên;
- Lưu.(VP).



Bùi Thanh Loan

QUẬN BÌNH THẠNH
UBMT TỔ QUỐC PHƯỜNG 2

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số .../....

TPHCM, ngày tháng năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc phường 2, quận Bình Thạnh có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, chúng tôi nhận thấy khi thực hiện dự án cần lưu ý những vấn đề sau:

- Khi vận chuyển vật liệu xây dựng (cát, đá) cần che chắn cẩn thận tránh rơi vãi xuống đường và phải sẵn sàng khắc phục hậu quả nếu xảy ra.

- Thực hiện thi công công trình theo hình thức cuốn chiếu, làm đến đâu chấm dứt đến đó, không thực hiện tràn lan làm ảnh hưởng đến môi sinh, môi trường xung quanh khu vực.

- Phải thành lập Ban giám sát tại từng địa bàn thi công; thành phần bao gồm là người dân điển hình và thành viên MTTQ tại nơi đó.

2. Ý kiến về kế hoạch quản lý môi trường cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi thống nhất với kế hoạch quản lý môi trường của cộng đồng trong giai đoạn thi công và trong giai đoạn đưa vào sử dụng. Tuy nhiên cần đưa thêm vào thiết bị kiểm tra tiếng ồn, khói bụi và phải đưa ra biện pháp khắc phục, thời gian khắc phục, người chịu trách nhiệm cụ thể, số điện thoại liên lạc cụ thể đến bộ phận, cá nhân chịu trách nhiệm khắc phục hậu quả.

TM. ỦY BAN MẶT TRẬN TỔ QUỐC

CHỦ TỊCH

Nơi gửi
- Như trên
- Lưu



**QUẬN BÌNH THẠNH
UBMT TỔ QUỐC PHƯỜNG 15**

**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc**

Số : ... /.....

TPHCM, ngày tháng năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc phường 15, quận Bình Thạnh có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, chúng tôi nhận thấy ngoài việc ô nhiễm do các hoạt động do các loại bụi từ việc vận chuyển các loại vật tư, chất thải từ công trường còn có các vấn đề phát sinh như sau:

+ Việc tập kết vật tư có thể là điều kiện phát sinh các loại dịch bệnh: sốt xuất huyết. Do đó, BQL dự án nên có kế hoạch cùng y tế địa phương để xử lý.

+ Tiếng ồn: Khi vận hành máy móc chắc chắn sẽ gây ra tiếng ồn, tuy nhiên người dân sẽ thông cảm nhưng BQL dự án cũng nên nghiên cứu hạn chế đến mức thấp nhất việc phát sinh tiếng ồn làm ảnh hưởng đến sinh hoạt của cộng đồng địa phương.

Nhìn chung các vấn đề có thể xảy ra trong báo cáo đã dự trù khá chi tiết. Tuy nhiên, các góp ý trên cần bổ sung vào báo cáo. Ngoài các vấn đề môi trường còn có các vấn đề xã hội kèm theo nếu như công trình có người ở lại.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi nhận thấy khá chặt chẽ. Tuy nhiên, việc giám sát tại cộng đồng không phải chỉ có hộ gia đình và đại diện khu phố mà còn có hệ thống thanh tra nhân dân được phân bổ tại từng khu phố; nên có sự phối hợp với chính quyền địa phương để được giới thiệu nhân sự thực hiện đúng chức năng giám sát của cộng đồng theo hướng dẫn của thành phố.

TM. ỦY BAN MẶT TRẬN TỔ QUỐC



Nơi gửi
- Như trên
- Lưu

Số :..... /.....

TPHCM, ngày tháng năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường 15, Quận Bình Thạnh có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, UBND nhận thấy:

- Về tác động của dự án đến môi trường:
 - Ô nhiễm do bụi: phát sinh nơi tại thi công.
 - Ô nhiễm chất thải rắn: do các hộ và khách vãng lai thiếu ý thức xả rác bừa bãi.
 - Ô nhiễm kênh rạch: có thể bị tắc nghẽn do thi công làm nước ứ đọng gây mùi hôi và phát sinh muỗi.
 - Ô nhiễm do nước thải chảy tràn từ các hộ dân không có hệ thống thoát nước ra cống thoát.
- Đề xuất biện pháp giảm thiểu:
 - Đề xuất quận hỗ trợ kinh phí nạo vét, khai thông cống, kênh rạch.
 - Phân công tổ QLTTĐT của phường thường xuyên tăng cường công tác kiểm tra địa bàn, kiên quyết xử lý các vụ việc vi phạm gây ô nhiễm môi trường trên mọi hình thức.

2. Ý kiến về kế hoạch quản lý môi trường cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng trong giai đoạn thi công, chúng tôi đồng ý đề xuất:

- UBND phường có kế hoạch tổ chức tuyên truyền vận động nhân dân có trách nhiệm giữ gìn vệ sinh môi trường hàng tháng.
 - Chỉ đạo BÐH tổ dân phố thành lập tổ kiểm tra và xử lý môi trường của từng tổ.
- Kịp thời khen thưởng những tấm gương chấp hành và tham gia tốt công tác bảo đảm vệ sinh môi trường.

Nơi gửi
- Như trên
- Lưu



QUẬN GÒ VẤP
UBND PHƯỜNG 5

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số : 16.41.C.V.- UB

TPHCM, ngày 08 tháng 10 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường 5, Quận Tân Bình có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua báo cáo tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, UBND phường 5 đồng ý thống nhất với các nội dung của báo cáo đánh giá tác động môi trường.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi thống nhất hoàn toàn, không có ý kiến gì thêm.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN NHÂN DÂN



KT. CHỦ TỊCH
PHÓ CHỦ TỊCH

Phạm Thị Hạnh

QUẬN GÒ VẤP
ỦY BAN MẶT TRẬN TỔ QUỐC
PHƯỜNG 5

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 17. I.C.V.MT

Phường 5, ngày 08 tháng 10 năm 2007

V/v: Trả lời ý kiến về dự án nâng cấp đô thị
Giai đoạn 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về thực hiện Dự án Nâng cấp Đô thị - Dự án Thành phần số 2 - Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 - Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa – Lò Gốm. Ủy Ban Mặt trận tổ quốc phường 5, quận Gò Vấp có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Sau khi xem qua bản tóm tắt nội dung báo cáo tác động môi trường, chúng tôi đề nghị khi thực hiện dự án nên đảm bảo, khói bụi, đất cát,... đảm bảo không kéo dài gây ảnh hưởng đến người dân trong khu vực.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi đề nghị phải lắng nghe ý kiến của người dân trong khu vực để không gây ảnh hưởng lớn đến người dân và công trình đạt chất lượng tốt.

TM. ỦY BAN MẶT TRẬN TỔ QUỐC

Nơi gửi
- Như trên
- Lưu



Hoàng Ngọc Văng

ỦY BAN MẶT TRẬN TỔ QUỐC
PHƯỜNG 14

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Số: 06...../Đ.V. MT

Phường 14, ngày 18 tháng 09 năm 2007

V/v : Trả lời ý kiến về dự án nâng cấp đô thị
Giai đoạn 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh.

Theo công văn số 669/NCĐT – KHĐT ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành phố Hồ Chí Minh về thực hiện Dự án Nâng cấp Đô thị - Dự án Thành phần số 2 - Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 – Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hoá – Lò Gốm. Ủy Ban Mặt trận tổ quốc phường 14 có những ý kiến như sau:

Về các vấn đề môi trường do hoạt động của dự án: Trong quá trình tổ chức thi công công trình thi sẽ phát sinh một số tác động làm ảnh hưởng đến môi trường cũng như chất lượng cuộc sống của người dân phát sinh khói bụi khí thải, tiếng ồn, tắc nghẽn cống thoát nước thải sinh hoạt, trật tự giao thông. Vì vậy chủ đầu tư cần có những phương án và biện pháp khắc khắc phục nhằm đảm bảo vệ sinh môi trường

Chủ đầu tư cần lưu ý:

Nên thiết kế lộ trình cho các phương tiện vận chuyển vật tư trang thiết bị trong quá trình thi công tránh lưu thông trong giờ cao điểm, giờ nghỉ làm ảnh hưởng đến trật tự giao thông và sự nghỉ ngơi của nhân dân. Trong vận chuyển tránh rơi vãi vật tư (che phủ bạt). Trong thi công đào đắp hệ thống cống thoát nước chú ý việc chiếm dụng mặt bằng, tắc nghẽn hệ thống thoát nước cần thiết lập lối đi tạm để không ảnh hưởng đến việc đi lại sinh hoạt của nhân dân.

Về kế hoạch quản lý môi trường của cộng đồng:

Tổ chức ban đại diện cộng đồng, triển khai kế hoạch quản lý môi trường trong cộng đồng dân cư khu vực thực hiện dự án và kiểm tra việc chấp hành các qui định của chủ đầu tư và các tác động tiêu cực của dự án đến môi trường cộng đồng trong giai đoạn thi công và khi đưa vào sử dụng.

Nơi gửi:

- Như trên;
- Lưu.

TM. ỦY BAN MẶT TRẬN TỔ QUỐC
CHỦ TỊCH



Số: 22/...UBND

TPHCM, ngày 24 tháng 9 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường 14, Quận Gò Vấp có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, UBND phường 14 nhận thấy:

- Về vị trí: dự án là khu dân cư thu nhập thấp, hẻm nối liền với trục giao thông chính của quận và thành phố. Đường Quang Trung – Phan Huy Ích gần ngã tư và cầu Chợ Cầu. Do đó, việc vận chuyển nguyên vật liệu cần lưu ý để không xảy ra tắc nghẽn giao thông trên trục lộ chính, cần xác định lối đi tạm trước khi lưu thông hẻm, phục hồi hẻm thi công sớm nhất để thuận tiện cho việc đi lại của các hộ dân trong hẻm. Phải duy trì hệ thống rào chắn quanh các khu vực thi công.
- Ô nhiễm do bụi: sử dụng thiết bị thi công công trình phù hợp nhằm giảm thiểu các tác động ô nhiễm cho môi trường xung quanh. Các thiết bị có xả khí nên bố trí xa nhà dân; thiết bị; phương tiện sử dụng phải đạt tiêu chuẩn về khí thải; thực hiện việc che phủ, nhà kho tạm để nguyên vật liệu tránh phán tán bụi vào môi trường xung quanh. Tưới nước công trình khi cần thiết.
- Ô nhiễm nước thải: cần lưu ý nước thải sinh hoạt các hộ dân khi thi công cải tạo cống thoát nước. Khi đào đường đặt ống thoát nước tránh để nước tràn ra ngoài đường.
- Về thời gian: đảm bảo giờ nghỉ trưa và đêm cho khu dân cư.

2. Ý kiến về kế hoạch quản lý môi trường cộng đồng:

UBND phường 14 đề nghị ban đại diện cộng đồng cử người tham gia công tác giám sát nâng cấp hệ thống cấp thoát nước, nâng cấp hẻm.

Nơi gửi
- Như trên
- Lưu



TM. ỦY BAN NHÂN DÂN
CHỦ TỊCH
CHỦ TỊCH

Số : 227/1.C.M. UB

TPHCM, ngày 27 tháng 10 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường 15, Quận Gò Vấp có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bảng tóm tắt các nội dung cơ bản của bảng báo cáo đánh giá tác động môi trường, UBND phường 15 nhận thấy ô nhiễm do bụi và biện pháp khắc phục đối với phường là cơ bản nhất trí. Bên cạnh đó cũng có những ý kiến như sau:

- Đường hẻm nhỏ nên sử dụng xe ba gác máy hoặc xe tải nhẹ từ 1 – 1,5 tấn để chuyên chở và có bao phủ.
- Các loại đất đá khi đào lên và vận chuyển đi nơi khác ngay vì để bốc mùi hôi thối do ô nhiễm sông Tham Lương trong lòng đất và tái lập mặt bằng tạo lối đi cho dân.
- Giờ thi công không quá 21 giờ đêm vì Khu dân cư đa số là người lao động, học sinh cần phải học tại nhà, nên sự nghỉ ngơi là rất cần thiết.
- Về tắc nghẽn giao thông: là không thể tránh khỏi, do vậy cần thi công tránh giờ cao điểm.
- Vật tư, thiết bị và nguồn nước thải cần phải thu gom vì không có những hẻm ra.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, UBND phường thống nhất hoàn toàn theo biện pháp của Ban quản lý Dự án Nâng cấp Đô thị.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN NHÂN DÂN

KT. CHỦ TỊCH
PHÓ CHỦ TỊCH



LÊ VĂN KÝ

QUẬN GÒ VẤP
ỦY BAN MẶT TRẬN TỔ QUỐC
PHƯỜNG 15

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 22 / Q.V.-MT

Phước Yên, ngày 21 tháng 9 năm 2007

V/v: Trả lời ý kiến về dự án nâng cấp đô thị
Giai đoạn 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về thực hiện Dự án Nâng cấp Đô thị - Dự án Thành phần số 2 - Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 - Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa – Lò Gốm. Ủy Ban Mặt trận tổ quốc phường 15, quận Gò Vấp có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Sau khi xem qua bản tóm tắt nội dung báo cáo tác động môi trường của Ban quản lý Dự án Nâng cấp Đô thị, phần II: tác động chính đến môi trường và các biện pháp giảm thiểu ô nhiễm. UBNDTTQ phường nhất trí với các đánh giá môi trường từ mức độ tác động, biện pháp khắc phục khi thực hiện công trình qua từng giai đoạn thi công, cần thực hiện đúng các biện pháp đã dự kiến.

Phía địa phương MTTQ có trách nhiệm tác động nhân dân cùng thực hiện công trình đem lại lợi ích chung cho nhân dân, cho cộng đồng.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi tán thành với các nội dung của Ban quản lý Dự án.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN MẶT TRẬN TỔ QUỐC



Trần Thị Tuyết

QUẬN PHÚ NHUẬN
ỦY BAN MẶT TRẬN TỔ QUỐC
PHƯỜNG 8

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số : SA /MT.....

TP.HCM, ngày 17 tháng 10 năm 2007

V/v: Trả lời ý kiến về dự án nâng cấp đô thị
Giai đoạn 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về thực hiện Dự án Nâng cấp Đô thị - Dự án Thành phần số 2 - Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 - Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa – Lò Gốm. Ủy Ban Mặt trận tổ quốc phường 8, quận Phú Nhuận có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Đề nghị chủ đầu tư quan tâm khi nâng cấp đường tránh mặt đường sẽ cao hơn nhà dân. Đề nghị xử lý hệ thống thoát nước đảm bảo không ứ đọng.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Sẽ thành lập ban giám sát cộng đồng theo QĐ 80 TTg và thông tư liên tịch 04.

TM. ỦY BAN MẶT TRẬN TỔ QUỐC

Nơi gửi
- Như trên
- Lưu



Đường Văn Hùng

QUẬN PHÚ NHUẬN
UBND PHƯỜNG 7

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 187/UBND

Phường 7, ngày 24 tháng 09 năm 2007

V/v trả lời ý kiến dự án nâng cấp đô thị
giai đoạn 2

CÔNG VĂN BẢN
Số: 239
26/09/07

Chuyển Phòng Kế hoạch

Kính gửi: Ban Quản Lý Dự Án Nâng Cấp Đô Thị thành phố Hồ Chí Minh

Theo công văn số: 669/NCĐT-KHĐT ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành phố Hồ Chí Minh về thực hiện Dự án Nâng cấp Đô thị – Dự án thành phần số 2 – Hạng mục 1: nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 – Các khu dân cư thu nhập thấp ngoài khu vực Tân Hóa – Lò Gốm. Ủy ban nhân dân phường 7 quận Phú Nhuận có ý kiến như sau:

1/ Về các vấn đề môi trường do hoạt động của dự án:

Thống nhất theo bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động của môi trường.

Yêu cầu Trong quá trình thi công cần có biện pháp xử lý nước triều cường, nước mưa do khu vực phường 7, quận Phú Nhuận là khu vực tương đối thấp.

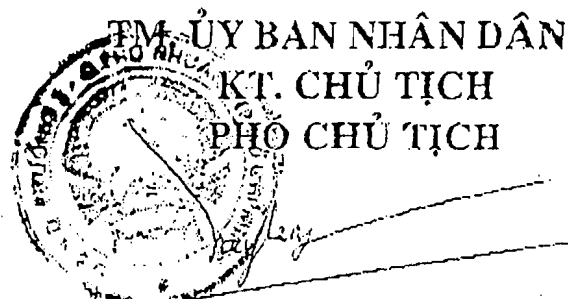
2/ Kế hoạch quản lý môi trường của cộng đồng:

Thống nhất theo bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động của môi trường.

Đề nghị thực hiện đúng bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động của môi trường.

Nơi nhận

- Như trên;
- Lưu: VT.



Nguyễn Vũ Hậu Giang

MTTQ QUẬN PHÚ NHUẬN CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
MTTQ PHƯỜNG 07

Độc lập – Tự do – Hạnh phúc

Số: 02/CV-MTTQ

Phường 07, ngày 20 tháng 09 năm 2007

Trả lời về dự án nâng cấp đô thị
giai đoạn 2

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
228
26/09/07

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị thành phố Hồ Chí Minh

Theo công văn số 668/NCĐT-KHĐT ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị thành phố Hồ Chí Minh về thực hiện dự án Nâng cấp Đô thị thành phần số 2 – Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 – Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hòa – Lò Gốm. UBND Mặt trận Tổ quốc phường 07, quận Phú Nhuận có những ý kiến sau:

Về các vấn đề môi trường do hoạt động của dự án:

Chúng tôi thống nhất về một số dự báo chính, mức độ, biện pháp khắc phục (như: ô nhiễm do bụi, tắc nghẽn giao thông tạm thời).

Cần bổ sung thêm: ô nhiễm do triều cường (địa bàn phường 07, quận Phú Nhuận).

Biện pháp khắc phục: sử dụng máy bơm nước để hút nước thải trong quá trình thi công, vận chuyển nước thải đến nơi xử lý, tránh ô nhiễm môi trường.

Về kế hoạch quản lý:

Chúng tôi thống nhất về kế hoạch quản lý môi trường của cộng đồng:

1. Kế hoạch quản lý môi trường của cộng đồng trong giai đoạn thi công (gồm: hạng mục, nội dung, tần suất, phương pháp, chịu trách nhiệm thực hiện).

2. Nhất trí với các hạng mục: nâng cấp hệ thống cấp nước, nâng cấp hệ thống thoát nước, nâng cấp hầm.

3. Cần thêm hạng mục: công trình xử lý nước thải, hệ thống máy bơm thoát nước khi triều cường.

4. Phần “chịu trách nhiệm thực hiện” thay vào là câu: “chịu trách nhiệm giám sát” ghi: đại diện Ban giám sát đầu tư cộng đồng thực hiện, (trong đó có đại diện khu phố, tổ dân phố và người dân được đề cử).

5. Cần cho dân biết số điện thoại cần thiết của Ban quản lý dự án nâng cấp đô thị (người được trực tiếp quản lý công trình thi công). Số điện

Ủy ban
26/9
Ủy ban
Thư

thoại của chủ đầu tư, địa chỉ, điện thoại cơ quan, điện thoại di động của các vị phụ trách trực tiếp công trình đang thi công) để Ban giám sát đầu tư cộng đồng của phường 07 thuận tiện trong việc liên lạc.

TM. MẶT TRẬN TỔ QUỐC



Phạm Xuân Tám

**QUẬN PHÚ NHUẬN
UBND PHƯỜNG 8**

**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc**

Số 318 /.../ND

TPHCM, ngày 21 tháng 9 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường 8, Quận Phú Nhuận có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bảng tóm tắt các nội dung cơ bản của bảng báo cáo đánh giá tác động môi trường, chúng tôi ưu cầu thực hiện đầy đủ các bước hợp lý để bảo vệ môi trường trong và ngoài công trường nhằm hạn chế thiệt hại phiền hà cho người dân; hạn chế những ảnh hưởng do ô nhiễm môi trường, tiếng ồn hoặc những phát sinh nào khác do hậu quả của phương pháp thực hiện của nhà thầu. Cụ thể:

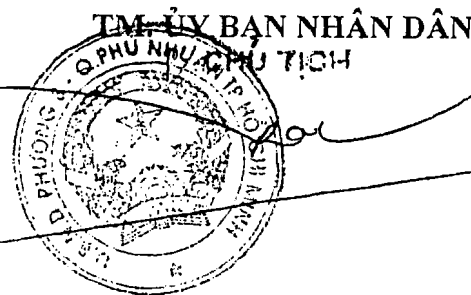
+ Công trình xây dựng trong khu dân cư phải có biện pháp đảm bảo không phát tán bụi, tiếng ồn, độ rung, ánh sáng vượt quá tiêu chuẩn cho phép.

+ Vận chuyển vật liệu xây dựng phải được thực hiện bằng các phương pháp bảo đảm ưu cấu kĩ thuật ... không gây ô nhiễm môi trường.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi đề nghị tuyên truyền vận động nhân dân có trách nhiệm trong việc giữ gìn vệ sinh môi trường.

Nơi gửi
- Như trên
- Lưu



Phạm Ngọc Trang

Số : 051.9.V. - UB MTTQ.

TPHCM, ngày 22 tháng 10 năm 20

V/v: Tham vấn ý kiến cộng đồng phục vụ công tác
lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc Phường Phước Long A, Quận 9 có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, chúng tôi thống nhất với việc dự báo một số tác động có ảnh hưởng đến môi trường trong quá trình thực hiện dự án; và các biện pháp khắc phục đề ra để giảm thiểu được tình trạng ô nhiễm môi trường.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi nhất trí với nội dung, kế hoạch quản lý môi trường của cộng đồng trong báo cáo tóm tắt các nội dung cơ bản của đánh giá tác động môi trường.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN MẶT TRẬN TỔ QUỐC



Huỳnh Hữu Phước

QUẬN 9
ỦY BAN NHÂN DÂN
PHƯỜNG PHƯỚC LONG A
Số: 192/UBND

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Phước Long A, ngày 22 tháng 10 năm 2007

V/v: Trả lời ý kiến về dự án nâng cấp
đô thị GD2.

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc "Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2" Dự án nâng cấp đô thị UBND phường Phước Long A có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Các biện pháp khắc phục trong giai đoạn thi công do ô nhiễm không khí, tắc nghẽn giao thông do đơn vị tư vấn đưa ra là phù hợp. Còn trong giai đoạn đưa vào sử dụng các biện pháp giữ gìn vệ sinh là do ý thức của người dân và trách nhiệm tuyên truyền của ban đại diện cộng đồng khu vực nâng cấp, đơn vị tư vấn có đưa ra các biện pháp là có thể sử dụng được.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Ban đại diện cộng đồng tại khu vực nâng cấp sẽ vận động người dân thực hiện các biện pháp mà đơn vị đề xuất..

Nơi nhận :

-Như trên;

-Lưu : VPUB.

TM. UBND PHƯỜNG PHƯỚC LONG A

KT. CHỦ TỊCH

PHÓ CHỦ TỊCH



Nguyễn Thị Ngọc Bích

QUẬN 12 · CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
UBMTTQ PHƯỜNG TÂN THỚI NHẤT Độc lập - Tự do - Hạnh phúc

Số: .../.../.../.../.../...

Tân Thới Nhất, ngày 25 tháng 10 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ công
tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý dự án Nâng cấp đô thị Tp. Hồ Chí Minh

Theo công văn số : 669, ngày 13/09/2007 của Ban Quản lý dự án Nâng cấp đô thị Thành phố Hồ Chí Minh về việc "Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2" Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc phường Tân Thới Nhất, Quận 12 có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, chúng tôi thống nhất với nội dung các biện pháp giảm thiểu môi trường đưa ra. Tuy nhiên, trong quá trình thi công cần phải lắp đặt các bảng hiệu công bố công trình thi công gồm : chủ đầu tư, đơn vị thi công, đơn vị tư vấn giám sát, thời gian khởi công, thời gian hoàn thành. Thường xuyên tăng cường kiểm tra thực hiện các biện pháp nêu trên.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi nhất trí với kế hoạch quản lý môi trường của cộng đồng trong báo cáo tóm tắt các nội dung cơ bản của đánh giá tác động môi trường.

3. Ý kiến :

Đề nghị Ban QLDA NCĐT Tp.HCM xem xét lại mức đóng góp 10% của các hộ dân.

Nơi nhận:

- Như trên;
- Lưu VPUB;

TM. ỦY BAN MẶT TRẬN TỔ QUỐC
CHỦ TỊCH



Phạm Văn Mỹ

QUẬN 12 CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
UBND PHƯỜNG TÂN THỜI NHẤT Độc lập - Tự do - Hạnh phúc

Số: 434/UBND-ĐT Phường Tân Thời Nhất, ngày 27 tháng 09 năm 2007
V/v: Trả lời ý kiến về dự án nâng cấp đô thị
Giai đoạn 2

Kính gửi: Ban Quản lý dự án Nâng cấp đô thị Tp. Hồ Chí Minh

Theo công văn số 669/NCĐT-KHĐT ngày 13/09/2007 của Ban Quản lý dự án Nâng cấp đô thị Thành phố Hồ Chí Minh về thực hiện dự án Nâng cấp đô thị - Dự án Thành phần số 2 - Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 - Giai đoạn 2 - Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa - Lò Gốm. Ủy ban nhân dân phường Tân Thời Nhất có những ý kiến sau:

Về các vấn đề môi trường do hoạt động của dự án : Thống nhất với bản tóm tắt các nội dung cơ bản của Báo cáo đánh giá tác động môi trường của Ban QLDA NCĐT Thành phố. Đề nghị Ban QLDA NCĐT cho lắp đặt các biển báo hiệu tại công trường đang thi công. Đối với việc vận chuyển bùn, đất, cát cần đảm bảo vệ sinh môi trường.

Về kế hoạch quản lý môi trường của cộng đồng : Thống nhất với kế hoạch quản lý môi trường của cộng đồng do Ban QLDA NCĐT Tp. Hồ Chí Minh đề xuất.

Nơi nhận:

- Như trên;
- TT. UBND phường (CT/PCT-ĐT);
- Lưu VPUB;

TM.ỦY BAN NHÂN DÂN
KT.CHỦ TỊCH
PHÓ CHỦ TỊCH



Thân Thế Hùng

QUẬN 12
UBND PHƯỜNG TÂN HƯNG THUẬN

Số 42/UBND-ĐC

V/v tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Tân Hưng Thuận, ngày 22 tháng 10 năm 2007

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị TP. Hồ Chí Minh

Theo công văn số :669/NCĐT-KHĐT ngày 13 tháng 9 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án Nâng cấp Đô thị. Ủy ban Nhân dân Phường Tân Hưng Thuận, Quận 12 có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án :

- + Ô nhiễm bụi, không khí từ hoạt động vận chuyển nguyên vật liệu và chất thải từ công trường trong giai đoạn thi công
- + Cần tổ chức công tác thi công hợp lý phù hợp tạo điều kiện đi lại sinh hoạt cho nhân dân địa phương, có kế hoạch xử lý ngập úng, lầy lội trong mùa mưa.

2. Ý kiến về kế hoạch quản lý môi trường cộng đồng

Thông nhất kế hoạch quản lý môi trường của Ban Dự án giao trách nhiệm cho ban giám sát cộng đồng, đề nghị xem xét hỗ trợ chi phí hoạt động và phụ cấp Ban giám sát

Nơi nhận:

- Như trên;
- Lưu.



Èo Văn Kiêm

QUẬN 12
UB.MTTQ P. TÂN HƯNG THUẬN

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Số: 21/ CV-MT

Tân Hưng Thuận, ngày 10 tháng 10 năm 2007

V/v Tham vấn ý kiến cộng đồng
Phục vụ công tác lập báo cáo
ĐTM của DA TP số 2

Kính gửi : Ban Quản lý Dự án Nâng cấp Đô thị thành phố Hồ Chí Minh

Theo công văn số : 699/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành phố Hồ Chí Minh về việc “ Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2 ” Dự án nâng cấp đô thị Ban Thường Thực Ủy Ban Mặt trận Tổ quốc phường Tân Hưng Thuận, quận 12 có ý kiến sau :

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án :

Qua tóm tắt các nội dung của bản đánh giá tác động đến môi trường và biện pháp khắc phục tác hại môi trường sẽ xảy ra trong thi công, UB/MTTQ phường Tân Hưng Thuận đồng ý với các biện pháp giảm thiểu môi trường đã đề ra. Tuy nhiên, trong quá trình thi công tránh kéo dài thời gian, không đúng theo bản thiết kế làm ảnh hưởng đến sinh hoạt và đời sống người dân trong khu vực thi công. Tránh gây ra hiện tượng ngập úng cục bộ làm khó khăn việc đi lại cho người dân. Cần thường xuyên tăng cường giám sát kiểm tra thực hiện các biện pháp nêu ra để xử lý kịp thời các sự cố có thể xảy ra. Tuy nhiên cần có sự phối hợp chặt chẽ của các cơ quan hữu quan để thực hiện tốt nội dung đề ra.

2. Ý kiến về giải toả nâng cấp đường:

Qua khảo sát thực tế tại khu vực dự án một số hộ dân bị ảnh hưởng trong tuyến đường nâng cấp đô thị có hoàn cảnh gia đình khó khăn không tự giải toả được, đề nghị Ban quản lý dự án có hướng hỗ trợ các hộ dân bị ảnh hưởng để thực hiện theo tiến độ thi công công trình.

Trên cơ sở các bản đánh giá tình hình ảnh hưởng và các biện pháp khắc phục các tác hại về môi trường. Chúng tôi đã có ý kiến trên và đề nghị Ban quản lý dự án phối hợp các cơ quan hữu quan tổ chức thực hiện theo các nội dung đã đề ra.

Nơi nhân:

- Như trên;
- Lưu.

TM/UB.MẶT TRẬN TỔ QUỐC PHƯỜNG



CHỦ TỊCH

Nguyễn Phạm Bảo Minh

QUẬN 12
ỦY BAN NHÂN DÂN
PHƯỜNG THANH LỘC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 523/UBND

Thanh Lộc, ngày 21 tháng 9 năm 2007

V/v: Trả lời ý kiến về dự án nâng cấp đô thị
giai đoạn 2.

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về thực hiện Dự án nâng cấp đô thị - Dự án Thành phần số 2- Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3- Giai đoạn 2- Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa- Lò Gốm. Ủy ban Nhân dân Phường Thanh Lộc có những ý kiến như sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

- Quá trình vận chuyển vật tư, tập kết vật tư, thi công công trình sẽ gây ảnh hưởng bụi đến môi trường.
- Quá trình đặt công thoát nước thải cần tính đến triều cường và cần phải xử lý van một chiều, nếu không sẽ ngập cục bộ toàn khu vực dự án.

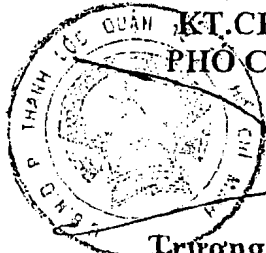
2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

- Khi vận chuyển vật tư phải có bạt che, tập kết vật tư phải được đậy kín, thi công phải có biện pháp hạn chế tác hại cho môi trường.
- Nghiên cứu thủy triều do mặt bằng thi công của dự án thấp hơn mặt nước cao nhất khoảng 0,8m- 1m.

Nơi gửi:

- Như trên;
- Lưu.

TM. ỦY BAN NHÂN DÂN
KT. CHỦ TỊCH
PHÓ CHỦ TỊCH



Trương Thanh Tú

QUẬN 12
ỦY BAN MẶT TRẬN TỔ QUỐC
PHƯỜNG THẠNH LỘC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 20 / MT-CV

Thanh Lộc, ngày 24 tháng 9 năm 2007

V/v: Trả lời ý kiến về dự án nâng cấp đô thị
Giai đoạn 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về thực hiện Dự án Nâng cấp Đô thị - Dự án Thành phần số 2 - Hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – Giai đoạn 2 - Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa – Lò Gốm. Ủy Ban Mặt trận tổ quốc phường Thạnh Lộc có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Tác động môi trường:

- Hầu hết các khu dân cư chưa có hệ thống cấp, thoát nước đúng tiêu chuẩn.
- Hệ thống sông rạch không được thường xuyên nạo vét, ô nhiễm nặng.
- Hệ thống giao thông nội đồng chưa được thi công đồng bộ, thường xuyên bị ngập lụt do triều cường (đường cấp theo các kênh rạch).
- Công tác thu gom rác thải còn bất cập, chông chéo gây ô nhiễm.
- Các công trình thi công kéo dài, vật tư, đất đá rơi vãi, ô nhiễm không khí, cản trở trong giao thông.

Các biện pháp giảm thiểu:

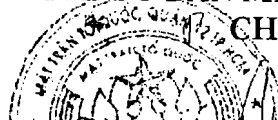
- Các cơ quan chức năng lập kế hoạch duy tu các hẻm, nạo vét kênh rạch, thu gom rác, xử lý các đơn vị, cá nhân vi phạm.
- Các tổ giám sát cộng đồng thường xuyên giám sát, kịp thời báo cáo MTTQ-chính quyền, các ngành chức năng có biện pháp xử lý các vi phạm liên quan đến lĩnh vực môi trường.

2. Về kế hoạch quản lý môi trường của cộng đồng:

- Kiến nghị UBND phường- tổ quản lý TTĐT thường xuyên kiểm tra, xử phạt các đơn vị, cá nhân vi phạm.
- MTTQ phường thành lập các tổ giám sát cộng đồng phối hợp với các đơn vị thi công đề xuất các biện pháp khắc phục các tác động xấu đến môi trường (nếu có).
- Tuyên truyền vận động nhân dân tham gia tốt việc gìn giữ, bảo vệ môi trường.

Nơi gửi:
- Như trên;
- Lưu.

TM. ỦY BAN MẶT TRẬN TỔ QUỐC
CHỦ TỊCH



Quận 12
UBND P. ĐÔNG HƯNG THUẬN

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 120 /CV-UB.

Đông Hưng Thuận, ngày 03 tháng 10 năm 2007

V/v trả lời ý kiến về dự án
nâng cấp đô thị Giai đoạn 2

Kính gửi: Ban Quản lý dự án Nâng cấp đô thị Tp. Hồ Chí Minh.

Theo công văn số 668/ NCDT-KHĐT ngày 13 tháng 09 năm 2007 của Ban Quản lý dự án nâng cấp đô thị Thành phố Hồ Chí Minh về thực hiện Dự án nâng cấp đô thị dự án Thành phần số 2 – hạng mục 1: Nâng cấp cơ sở hạ tầng cấp 3 – giai đoạn 2 – Các khu dân cư thu nhập thấp ngoài lưu vực Tân Hóa – Lò Gốm. Ủy Ban Nhân Dân phường Đông Hưng Thuận có những ý kiến sau:

1. Về các vấn đề môi trường do hoạt động của dự án:

Thống nhất về đề xuất biện pháp khắc phục ô nhiễm môi trường do Ban quản lý dự án đề xuất, tuy nhiên để thực hiện công tác được tốt hơn, đề nghị khi tiến hành thi công công trình cần thi công cuốn chiếu, từng hẻm này đến hẻm khác, tránh triển khai thi công đồng bộ cùng một lúc nhiều công trình làm ảnh hưởng đến sinh hoạt cũng như đời sống của khu dân cư và môi trường xung quanh.

2. Về kế hoạch quản lý môi trường của cộng đồng:

Đề nghị bổ sung công tác giám sát tác nghẽn giao thông. Yêu cầu phải có sự hỗ trợ của cảnh sát khu vực tại những khu vực triển khai thi công.

Nơi nhận:

- Như trên,
- Lưu

TM.UBND PHƯỜNG

KT.Chủ tịch

Phó chủ tịch



Nguyễn Thanh Tuấn

QUẬN 12
UB MTTQ P. ĐÔNG HƯNG THUẬN

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số : 011/.....

TPHCM, ngày 05 tháng 11 năm 2007

V/v: *Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2*

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “*Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2*” Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc phường Đông Hưng Thuận, Quận 12 có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, UBMT TQ Phường Đông Hưng Thuận nhận thấy các biện pháp giảm thiểu môi trường đưa ra là hợp lý, khá chặt chẽ. Tuy nhiên, trong quá trình thi công tránh kéo dài thời gian làm ảnh hưởng đến sinh hoạt người dân xung quanh. Thường xuyên tăng cường kiểm tra thực hiện các biện pháp nêu trên.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi nhất trí với nội dung, kế hoạch quản lý môi trường của cộng đồng trong báo cáo tóm tắt các nội dung cơ bản của đánh giá tác động môi trường. Cần thực hiện công khai, vận động người dân cùng tham gia.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN MẶT TRẬN TỔ QUỐC



Phạm Văn Điền

QUẬN THỦ ĐỨC
UBND PHƯỜNG LINH TÂY

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số : 160 /L.LP...

TPHCM, ngày 25 tháng 10 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường Linh Tây, Quận Thủ Đức có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

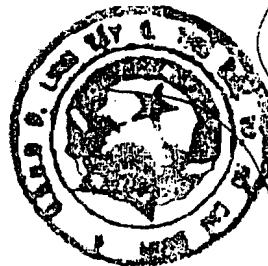
- + Về tiếng ồn : do tác động từ các phương tiện máy móc cơ giới trong quá trình thi công.
- + Khói bụi: trong thi công lượng khí thải của các phương tiện cơ giới, nhựa nóng và quá trình đào đất, đường thi công.
- + Rác xà bần : do đào đất, tháo dỡ các vật kiến trúc để mở rộng hẻm.
- + Nước thải: thi công xây dựng cống thoát nước và hệ thống nước máy.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

- + Giải phóng mặt bằng đến đâu thi công đến đó và dứt điểm tồn đọng đất, xà bần trên mặt đường.
- + Hạn chế đến mức thấp nhất khói bụi, tiếng ồn trong thi công.

TM. ỦY BAN NHÂN DÂN

Nơi gửi
- Như trên
- Lưu



PHÓ CHỦ TỊCH

Hồ Tấn Hoàng

QUẬN THỦ ĐỨC
UBMT TỔ QUỐC P. LINH TÂY

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 131/CS.ĐT. KT

TPHCM, ngày 22 tháng 07 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 668/NCĐT-KHĐT, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc phường Linh Tây, quận Thủ Đức có những ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, UBMTTQ phường Linh Tây có ý kiến sau:
cần hạn chế mức độ ô nhiễm do khí thải các loại động cơ khi thi công. Tránh chiếm dụng lòng lề đường để vật tư, xà bần và hạn chế tiếng ồn, bụi, nước thải.

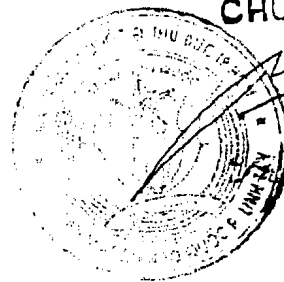
2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Vận động nhân dân cùng hưởng ứng, tham gia bảo vệ môi trường và quản lý công trình thi công.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN MẶT TRẬN TỔ QUỐC

CHỦ TỊCH



Phan Văn Phương

QUẬN THỦ ĐỨC
UBND PHƯỜNG LINH CHIỂU

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số 176/UBND

TPHCM, ngày 22 tháng 10 năm 2007

V/v: Tham vấn ý kiến cộng đồng phục vụ
công tác lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Nhân dân Phường Linh Chiểu, Quận Thủ Đức có ý kiến sau:

1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, UBND Phường Linh Chiểu thống nhất với biện pháp giảm thiểu ô nhiễm môi trường do BQLDA đưa ra.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Sau khi xem qua nội dung kế hoạch quản lý môi trường của cộng đồng, UBND phường Linh Chiểu thống nhất với kế hoạch đề ra.

Nơi gửi
- Như trên
- Lưu

TM. ỦY BAN NHÂN DÂN



KT. CHỦ TỊCH
HỒ CHỦ TỊCH

Hồ Hoàng Chính

Số : 17/.....

TPHCM, ngày tháng năm 20

V/v: Tham vấn ý kiến cộng đồng phục vụ công tác
lập báo cáo ĐTM của DATP số 2

Kính gửi: Ban Quản lý Dự án Nâng cấp Đô thị Tp. Hồ Chí Minh

Theo công văn số: 669, ngày 13 tháng 09 năm 2007 của Ban Quản lý Dự án Nâng cấp Đô thị Thành Phố Hồ Chí Minh về việc “Tham vấn ý kiến cộng đồng phục vụ công tác lập báo cáo ĐTM của DATP số 2” Dự án nâng cấp đô thị. Ủy ban Mặt trận Tổ quốc Phường Linh Chiểu, Quận Thủ Đức có ý kiến sau:

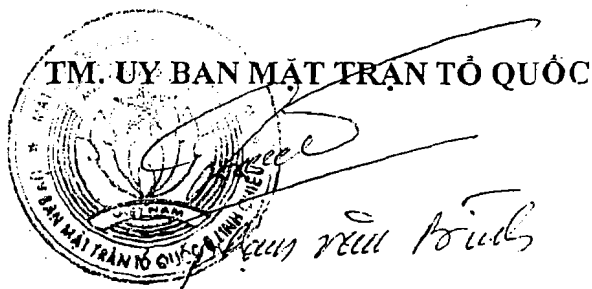
1. Ý kiến về các vấn đề môi trường do hoạt động của dự án:

Qua bản tóm tắt các nội dung cơ bản của báo cáo đánh giá tác động môi trường, chúng tôi thống nhất với việc dự báo một số tác động có ảnh hưởng đến môi trường trong quá trình thực hiện dự án; và các biện pháp khắc phục đề ra để giảm thiểu được tình trạng ô nhiễm môi trường.

2. Ý kiến về kế hoạch quản lý môi trường của cộng đồng:

Về kế hoạch quản lý môi trường của cộng đồng, chúng tôi nhất trí với nội dung, kế hoạch quản lý môi trường của cộng đồng trong báo cáo tóm tắt các nội dung cơ bản của đánh giá tác động môi trường.

Nơi gửi
- Như trên
- Lưu



SOCIO-ECONOMIC INVESTIGATION SAMPLE

Mã số khu vực:

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

Mã số gia đình:

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

GIỚI THIỆU

Đây là dự án nhằm dẫn tư nâng cấp hộ tăng (tạo rặng hồ sơ, cấp nước, thoát nước, chiếu sáng ...) trong khu vực dân cư có thu nhập thấp và có sự tham gia của người dân. Ý kiến của người dân là rất quan trọng góp phần cho dự án thành công tốt đẹp. Vì vậy, trước tiên chúng tôi xin cảm ơn sự cộng tác của các hộ đã cùng tham gia cuộc khảo sát này.

Ngày tháng năm 2006

Quận: ... Quận Thủ Đức Phường: ... Phường Thủ Đức

Nhà số: ... 17/17 Tổ dân phố: ... 19 ... Khu phố: ... Đường Thủ Đức Hòa Thuận

Tên chủ hộ: ... Trương Thị Ngọc Nam (Nữ) ; Số DT: ... 0000000000

PHẦN CÂU HỎI

A. TỔNG QUÁT

1. Số hộ cùng chung sống trong nhà:

- a. 1 hộ b. 2 hộ c. > 2 hộ

2. Các thành viên trong gia đình:

| Số | Họ và tên | Nam | nữ | Tuổi | Quan hệ với chủ hộ | Trình độ học vấn | Tình trạng cư trú | Nghề nghiệp |
|----|---------------------|-----|----|------|--------------------|------------------|-------------------|-------------|
| a | b | c | d | e | | g | h | i |
| 1 | Trương Thị Ngọc Nam | x | | 52 | | 6 | | Chủ hộ |
| 2 | Trương Thị Ngọc | | x | 50 | Vợ | 12, Tiểu học | | Chủ hộ |
| 3 | Trương Thị Ngọc | x | | 27 | Con | 5 | | Chủ hộ |
| 4 | Trương Thị Ngọc | | x | 22 | Con | 5 | | Chủ hộ |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |

Cách ghi: Trình độ học vấn

- | | | | |
|----------------------------|-----|-----------------------------|-----|
| Chưa hoàn tất bậc tiểu học | = 1 | Trung học chuyên sâu nghiệp | = 5 |
| Tiểu học (tập 1-5) | = 2 | Cao đẳng, Đại học | = 6 |
| Cấp 2 (tập 6-8) | = 3 | Trên Đại học | = 7 |
| Cấp 3 (tập 10-12) | = 4 | Không biết chữ | = 8 |

Tình trạng cư trú:

- KT1 (NK1) = 1 KT2 (NK2) = 2 KT3 (NK3) = 3 KT4 (NK4) = 4

PHẦN B. THU NHẬP VÀ VIỆC LÀM

3. Bao nhiêu người trong gia đình có thu nhập?

| Số | Tên | Nghề/công việc | Mức nghề | Phương tiện đi làm | Thu nhập thường xuyên(đồng/tháng)đ | Thu nhập không thường xuyên(đồng/.....) | Giới tính Lý do |
|-----------|--------------|----------------|-------------|-----------------------|---|--|--------------------|
| a | b | c | d | e | f | g | h |
| 1 | Nguyễn Văn A | Thợ xây | 4 | 2 | 2.000.000 | | Ch. Nam |
| 2 | Nguyễn Thị B | Đội công nhân | 4 | 3 | 1.500.000 | | Ch. Nữ |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| Tổng cộng | | | | | | | |

* Cách chỉ mã nghề:

- 1 = Công chức nhà nước; 2 = Bộ đội/Công an; 3 = Bác sĩ, Kiến trúc sư, kỹ sư, Giáo viên,
 4 = Công nhân xi nghiệp; 5 = Kinh doanh, thương mại; 6 = Sản xuất thủ công CN;
 7 = Dịch vụ; 8 = Lao động làm thuê; 9 = Hưu trí; 10 = Nghề khác

* Cách chỉ mã Phương tiện đi làm:

- 1 = Đi bộ 2 = Xe đạp 3 = Xe gắn máy
 4 = Xe buýt 5 = Xe đưa rước công nhân 6 = Phương tiện khác (giữ rõ)

4. Bao nhiêu người trong gia đình hiện đang không có việc làm?

| Số | Tên | Công việc trước đây | Thời gian không có việc làm tích đến nay | Lý do không có việc làm |
|----|--------------|---------------------|---|----------------------------|
| a | b | c | d | e |
| 1 | Nguyễn Văn A | Thợ xây | 8/2016 | Đã nghỉ hưu |
| 2 | Nguyễn Thị B | Đội công nhân | | Chưa bắt đầu |
| 3 | | | | |
| 4 | | | | |

5. Mức chi tiêu trung bình hàng tháng của gia đình là:

| Stt | Các khoản chi | Số tiền (đồng)/ tháng..... | Chi chú |
|-----|-------------------------|----------------------------|---------|
| 1 | Lương thực, thực phẩm | 1.500.000 | |
| 2 | Điện | 110.000 | |
| 3 | Nước | 40.000 | |
| 4 | Chất đốt | 200.000 | (100) |
| 5 | Điện thoại/ Internet | 150.000 | (0) |
| 6 | Tiền đồ rác | 15.000 | |
| 7 | Di chuyển, đi lại/ xăng | 500.000 | (100) |
| 8 | Thuê nhà (nếu có) | | |
| 9 | Học hành | 120.000 | |
| 10 | Khám chữa bệnh | | |
| 11 | Giải trí | | |
| 12 | Đám tiệc | 100.000/1 lần | |
| 13 | Chi phí khác | | |
| | TỔNG | | |

2. Thời gian xây dựng:

- a. Trước năm 1975
 b. Từ năm 1975-1980
 c. Sau 10/10/1993
 d. Sau 2003

7. Trước kia gia đình sống ở đâu?

- a. TP. HCM
 b. Ngoài TP. HCM (ou thể)... *Xã... Huyện... Tỉnh... Quận... Huyện... Quận... Tỉnh...*

8. Diện tích

- a. Diện tích nhà (dài x rộng): *13,5* m x *3,6* m = *54* m²
 b. Diện tích đất (dài x rộng): *13,5* m x *3,6* m = *54* m²

9. Dạng nhà:

- a. Kiên cố
 b. Bán kiên cố
 c. Khung gỗ
 d. Mái lá
 e. Nhà tạm
 e.Loại khác(ghi rõ)

10. Gia đình có giấy tờ chứng nhận nhà đất nào?

- a. Giấy chứng nhận QSD đất
 c. Giấy chứng nhận tạm thời
 b. Giấy chứng nhận QSH nhà
 d. Giấy tờ khác
 e. Không có giấy tờ

Lý do không có giấy tờ:

- e1. Quá mướn
 e2. Không đủ thủ tục pháp lý
 e3. Nhà đất thuê
 e4. Lý do khác

11. Tình trạng sở hữu của nhà

- a. Nhà riêng
 b. Thuê của tư nhân
 c. Thuê của nhà nước
 d. Tập thể/ nhà tôn giáo
 e. Lý do khác (ghi rõ)

12. Vị trí nhà

- a. Mặt tiền
 b. Nhà trong hẻm > 5m
 c. Nhà trong hẻm từ 2-5m
 d. Nhà trong hẻm < 2m
 e. Nhà ven kênh
 f. Nhà trên kênh

PHẦN IV. ĐIỀU KIỆN SINH HOẠT VÀ VỆ SINH MÔI TRƯỜNG

13. Nước ăn, uống/ sinh hoạt của gia đình từ đâu?

- | Nguồn nước | Nước ăn, uống | Nước sinh hoạt |
|-------------------------------|-------------------------------------|-------------------------------------|
| a. Nước máy qua đồng hồ riêng | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Nước máy qua cầu lợi | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Nước sông, rạch, ao, | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Nước mưa | <input type="checkbox"/> | <input type="checkbox"/> |

- e. Nước giếng máy
- f. Nước giếng
- g. Đổ nước
- h. Nguồn khác

14. Nước thải, thoát nước gia đình sử dụng là:

- a1. Bể tự hoại a2. Nối trực tiếp vào hệ thống thoát nước thải
- a3. Tự thấm a4. a5. Cách khác:.....

Khác:.....

15. Nhà vệ sinh gia đình sử dụng:

- a1. Nhà vệ sinh cơ bể tự hoại a2. Nhà vệ sinh thoát ra cống thoát nước
- a3. Nhà vệ sinh công cộng a4. Nhà vệ sinh trên kênh rạch, ao
- a5. Cách khác:.....

16. Gia đình tham gia dịch vụ thu gom rác nào?

- a1. Nhà nước a2. Dân lập a3. Đổ vào bể rác công cộng
- a4. Đổ xuống kênh rạch a5. Đổ ngoài đường
- a6. Đốt a7. Cách khác (nếu cụ thể).....

17. Gia đình sử dụng nguồn điện từ đâu?

- a1. Có đồng hồ riêng a2. Cầu chì hàng xóm
- a3. Dùng nguồn khác (cụ thể)..... a4. Không có điện

18. Các phương tiện sinh hoạt khác của gia đình là:

- a1. Có Điện thoại riêng
- a2. Có Truyền hình cáp, laptop, đặt cửa đôn vị... HIV.....
- a3. Có máy vi tính

19. Đường đi vào nhà của gia đình hiện nay là:

- a. Đường nhựa b. Đường bê tông c. Đường đá sỏi d. Đường đất

20. Trong năm, đường vào nhà có bị ngập không?

- a. Có b. Không

20a. Nếu có xin cho biết thời điểm ngập:

- a1. Một năm?..... 03..... lần
- a2. Một tháng?..... lần

20b. Ngập sâu khoảng bao nhiêu?..... 0,50..... cm

20c. Nguyên nhân ngập lụt từ đâu?

- a1. Mưa lớn a2. Triều cường
- a3. Không có hệ thống thoát nước a4. Hệ thống thoát nước kém

27. Gia đình có dự định sửa chữa nhà khi mở rộng hẻm thì:

- a. Cải thiện hệ thống thoát nước
- b. Lắp đặt đường ống cấp nước
- c. Trang bị hệ thống thu gom rác
- d. Nhiều đường sá hơn
- e. Mở rộng hẻm/ đường
- f. Không còn ngập lụt
- g. Được vay vốn làm ăn
- h. Chỉ quy 5/ tạo thêm việc làm
- i. Điều kiện học chữ/ học nghề tốt hơn
- j. Xây dựng và sửa chữa nhà
- k. Làm cho khu vực an toàn hơn
- l. Dịch vụ y tế/ vệ sinh tốt hơn
- m. Ý kiến khác.....

28. Trường hợp công nhân, đường sá, điện nước và khu vực của cải tạo, nâng cấp tại học tại gia đình có sẵn sàng đóng góp kinh phí không ?

- a. Có
Trường hợp đóng góp, khả năng gia đình đóng góp được bao nhiêu?
 - a1. 100.000đ
 - a2. từ 100.000đ đến 200.000đ
 - a3. từ 200.000đ đến 300.000đ
 - a4. từ 300.000đ đến 400.000đ
 - a5. từ 400.000đ đến 500.000đ
 - a6. từ 500.000đ đến 1.000.000đ
 - a7. số. Trên 1.000.000đ, cụ thể là..... đồng
- b. Không

29. Nếu gia đình có nhu cầu sửa nhà khi mở rộng hẻm thì:

- a. Khả năng gia đình tự lo toàn bộ
- b. Gia đình chỉ lo được một phần

30. Nếu không đủ khả năng gia đình có dự định vay vốn để sửa nhà không?

- a. Có
 - a1. Nếu vay 5 triệu, Khả năng trả góp hàng tháng của gia đình là..... đồng
 - a2. Nếu vay 10 triệu, Khả năng trả góp hàng tháng của gia đình là..... đồng
 - a3. Nếu vay 15 triệu, Khả năng trả góp hàng tháng của gia đình là..... đồng
 - a4. Nếu vay 20 triệu, Khả năng trả góp hàng tháng của gia đình là..... đồng
- b. Không.

31. Gia đình có muốn kênh rạch được dọn sạch trở thành khu vực thoáng đãng không?

- a. Có
- b. Không
- * Nếu có gia đình muốn khu vực kênh trở thành :*
 - a1 Vườn hoa/ Công viên và nơi giải trí
 - a2 Một con đường mới
 - a3 Cửa hàng, quán ăn
 - a4 Công trình khác (Nếu.....)

.....

a.

b.

c.


d.

e.

Xin chân thành cảm ơn gia đình đã tham gia trả lời

Ngày 11 tháng 11 năm 2005
(Người trả lời ký tên và ghi rõ họ tên)

Người kiểm phiếu,
(ký tên và ghi rõ họ tên)

 Bùi Quang Phương

RESULTS OF MEASUREMENT AND ANALYSIS OF ENVIRONMENTAL QUALITY

CEECO

TRUNG TÂM MÔI TRƯỜNG VÀ SINH THÁI ỨNG DỤNG
CENTER OF ENVIRONMENT AND APPLIED ECOLOGY
26 Đinh Bộ Lĩnh, P.24, Q. Bình Thạnh, Tp. Hồ Chí Minh
Tel: (08) 5117321, 5117588 Fax: (08) 5117320

PHIẾU KẾT QUẢ KIỂM NGHIỆM

Số: 036/10-07 Trang: 1/1

- Đơn vị yêu cầu: Ban Quản lý Dự án Nâng cấp Đô thị
- Ngày thu mẫu: Ngày 19 tháng 9 năm 2007 đến ngày 29 tháng 9 năm 2007
- Ngày trả kết quả: Ngày 10 tháng 10 năm 2007
- Cán bộ thu mẫu: Ngô Đình Tuấn, Phạm Thanh Toàn, Nguyễn Văn Phụng, Võ Phương Hoài
- Cán bộ phân tích: Ngô Đình Tuấn, Phạm Thanh Toàn
- Thời gian lưu mẫu: 5 ngày kể từ ngày trả kết quả
- Vị trí thu mẫu:
 - BTH-02: 280/110/2 Bùi Hữu Nghĩa, Phường 2
 - BTH-15: 3/53 Điện Biên Phủ, Phường 15
 - PN- 07: 33/2 Cẩm Bá Thước-Phường 7
 - PN-08: 270/9 Nguyễn Trọng Tuyển-Phường 8
 - Q9-01: 345 Nam Hòa-Phước Long A
 - TĐ-01: 763/18/1 Kha Vạn Cân, KP 2, Phường Linh Tây
 - TĐ-02: 51/17 Đường số 10, KP 4, Phường Linh Chiểu
 - GV-5: 174/44/A3 Kp 7, P.5
 - GV-15: 20/220 Đường Thống Nhất
 - GV-14: 51/6A Phạm Văn Chiêu
 - Q12-01: A162 Tô 15-Kp2, Phường Đông Hưng Thuận
 - Q12-02: 134 Kp 3 Tô 2, Phường Thạnh Lộc
 - Q12-03: 63/7 Kp 7, Tân Thới Nhất
- Phương pháp phân tích
 - SO₂ : TCVN 5971 – 1995
 - NO₂ : TCVN 6137 – 1996
 - Bụi : TCVN 5067 – 1995
 - Ồn : Thiết bị chuyên dụng

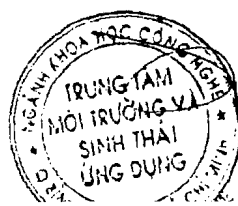
KẾT QUẢ PHÂN TÍCH

| Ký hiệu mẫu | Kết Quả | | | |
|-------------|--------------------------------------|--------------------------------------|----------|--------------------------|
| | SO ₂ (mg/m ³) | NO ₂ (mg/m ³) | Ồn (dBA) | Bụi (mg/m ³) |
| BTH-02 | 0,085 | 0,066 | 68,7 | 0,18 |
| BTH-15 | 0,162 | 0,107 | 62,4 | 0,27 |
| PN- 07 | 0,056 | 0,072 | 52,3 | 0,14 |
| PN-08 | 0,106 | 0,086 | 62,8 | 0,18 |
| Q9-01 | 0,068 | 0,049 | 65,0 | 0,23 |
| TĐ-01 | 0,042 | 0,068 | 72,0 | 0,33 |
| TĐ-02 | 0,098 | 0,078 | 68,2 | 0,21 |
| GV-5 | 0,069 | 0,076 | 65,5 | 0,18 |
| GV-15 | 0,083 | 0,068 | 67,4 | 0,22 |
| GV-14 | 0,065 | 0,056 | 65,9 | 0,13 |
| Q12-01 | 0,067 | 0,098 | 63,1 | 0,11 |
| Q12-02 | 0,082 | 0,094 | 63,3 | 0,24 |
| Q12-03 | 0,056 | 0,074 | 61,2 | 0,17 |

PHÒNG PHÂN TÍCH

NGÔ ĐÌNH TUẤN

GIÁM ĐỐC



HOÀNG VĂN TÙNG

HIỆN TRẠNG CHẤT LƯỢNG MÔI TRƯỜNG KHÔNG KHÍ

1. Chất lượng không khí ven đường

Kết quả chất lượng không khí ven đường trong năm 2006

| Thông số | Trạm | Tổng giá trị | Tổng giá trị tin tưởng | % | Giá trị trung bình giờ lớn nhất | Thời gian | Giá trị trung bình năm 2006 | Giá trị trung bình năm 2005 |
|-----------------|-------|--------------|------------------------|-------|---------------------------------|---------------------|-----------------------------|-----------------------------|
| CO | TN | 8385 | 7540 | 89.92 | 23.4 | 01/10/2006 18:00 | 4.1 | 4.5 |
| | BC | 8701 | 6579 | 75.61 | 18.9 | 10/23/2006 10:00 | 4.7 | 3.2 |
| | HB | 6426 | 964 | 15.00 | 19.3 | 02/01/2006 19:00 | 4.8 | 4.2 |
| | DOSTE | 8735 | 465 | 5.32 | 28.1 | 02/15/2006 18:00 | 7.1 | 4.6 |
| NO ₂ | DOSTE | 8735 | 4250 | 48.65 | 289.6 | 09/29/2006 23:00 | 67.0 | 17.4 |
| | TN | 8385 | 4437 | 52.92 | 74.3 | 05/26/2006 08:00 | 20.4 | 33.6 |
| | BC | 8701 | 6271 | 72.07 | 138.7 | 11/04/2006 19:00 | 32.4 | 41.8 |
| O ₃ | DOSTE | 8735 | 7173 | 82.12 | 190.4 | 01/19/2006 12:00 | 19.8 | 26.5 |
| | HB | 6426 | 4921 | 76.58 | 166.4 | 01/11/2006 12:00 | 21.0 | 25.2 |
| PM10 | TN | 8385 | 4355 | 51.94 | 375.5 | 09/22/2006 02:00 | 47.9 | 65.3 |
| | BC | 8701 | 7179 | 82.51 | 361.9 | 06/22/2006 10:00 | 93.9 | 103.0 |
| SO ₂ | TN | 8385 | 7007 | 83.57 | 196.9 | 03/03/2006 08:00 | 25.0 | 29.3 |

Nguồn: Chi Cục Bảo vệ môi trường Tp. Hồ Chí Minh, 2006

Ghi chú:

TN: Trạm tại bệnh viện Thống Nhất, Quận Tân Bình

BC: Trạm tại Phòng giáo dục huyện Bình Chánh, Quận Tân Bình

HB: Trạm tại trường Hồng Bàng, Quận 5

DOSTE: Trạm tại Sở Khoa học Công nghệ, Quận 3

2. Chất lượng không khí khu dân cư

Chất lượng không khí khu dân cư trong năm 2006

| Thông số | Trạm | Tổng giá trị | Tổng giá trị tin tưởng | % | Giá trị trung bình giờ lớn nhất | Thời gian | Giá trị trung bình năm 2006 | Giá trị trung bình năm 2005 |
|-----------------|------|--------------|------------------------|-------|---------------------------------|---------------------|-----------------------------|-----------------------------|
| NO ₂ | D2 | 5958 | 4313 | 72.39 | 98.3 | 08/08/2006 01:00 | 18.7 | 20.7 |
| | ZO | 8329 | 6477 | 75.61 | 73.6 | 07/20/2006 20:00 | 18.3 | 27.1 |
| O ₃ | TS | 7720 | 5982 | 77.49 | 206.2 | 12/28/2006 13:00 | 34.6 | 22.7 |
| | D2 | 6565 | 5358 | 81.61 | 243.2 | 01/19/2006 13:00 | 40.9 | 40.0 |
| | QT | 3569 | 1838 | 51.50 | 246.4 | 02/01/2006 13:00 | 39.3 | 60.2 |
| | ZO | 8536 | 7289 | 85.39 | 243.1 | 10/14/2006 06:00 | 33.4 | 35.2 |
| PM10 | D2 | 6565 | 5656 | 86.06 | 385.4 | 01/19/2006 23:00 | 58.9 | 73.2 |
| | QT | 3569 | 2000 | 56.04 | 375.1 | 03/27/2006 18:00 | 88.3 | 92.5 |
| | ZO | 8536 | 7658 | 89.71 | 497.7 | 04/08/2006 08:00 | 94.5 | 79.0 |
| SO ₂ | D2 | 6565 | 3179 | 48.42 | 198.9 | 03/03/2006 09:00 | 18.6 | 65.1 |
| | QT | 3569 | 1446 | 40.52 | 137.8 | 10/30/2006 12:00 | 28.6 | 31.6 |

Nguồn: Chi Cục Bảo vệ môi trường Tp. Hồ Chí Minh, 2006

Ghi chú:

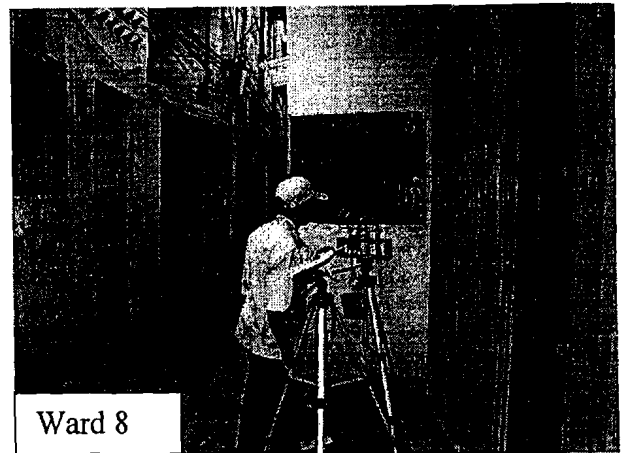
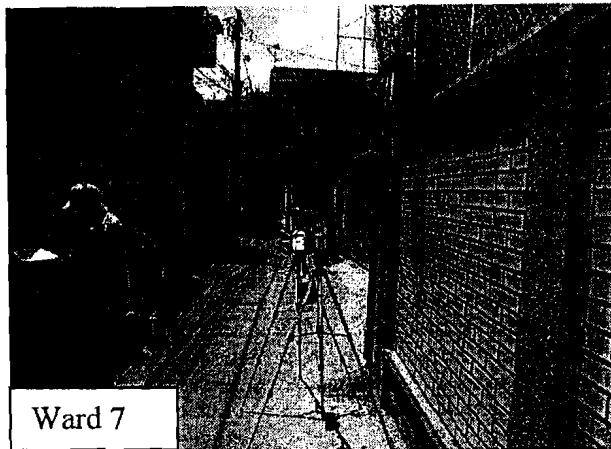
D2: Trạm tại UBND Quận 2

ZO: Trạm tại Thảo Cầm Viên, Quận 1

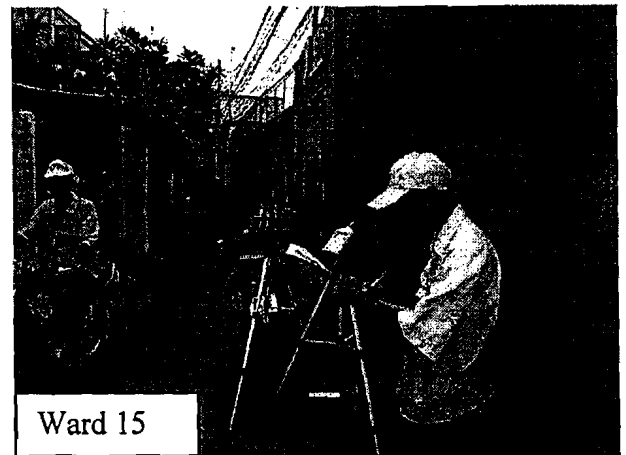
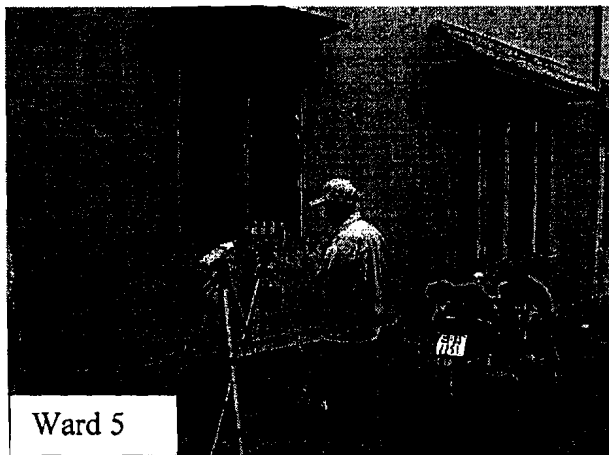
TS: Trạm tại Tân Sơn Hoà- Trương Quốc Dung, Quận Phú Nhuận

QT: Trạm tại Công viên phần mềm Quang Trung, Quận 12

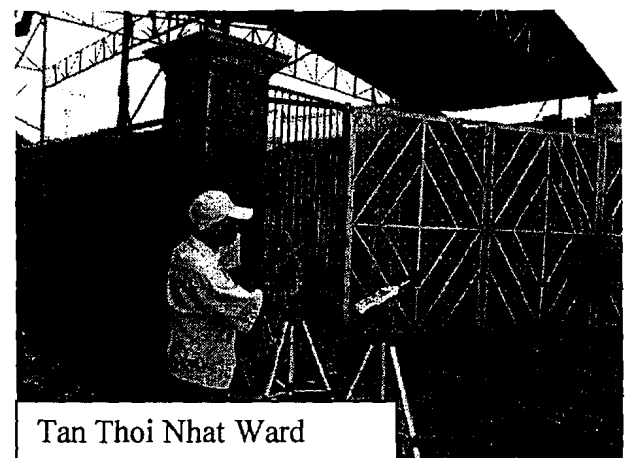
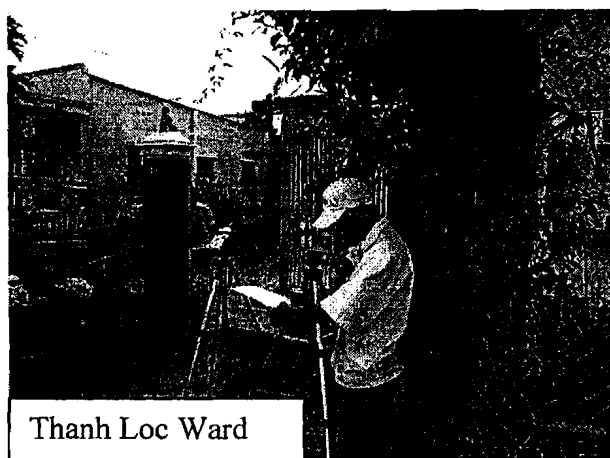
SOME PICTURES DURING IMPLEMENTATION OF EIA REPORT



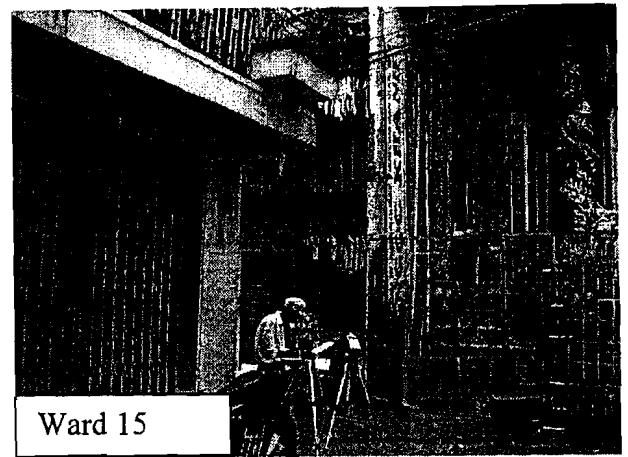
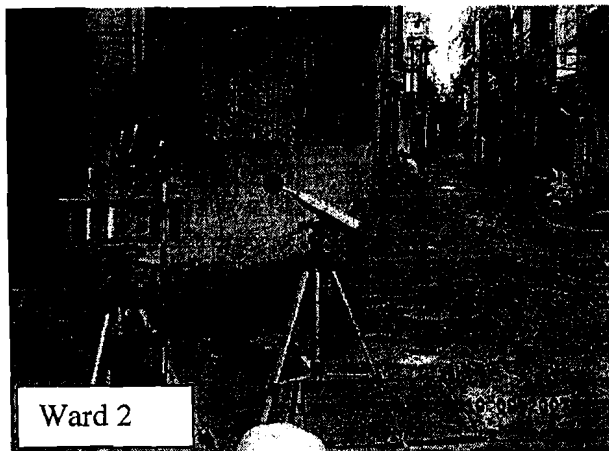
Figures of environmental sampling at Phu Nhuan District



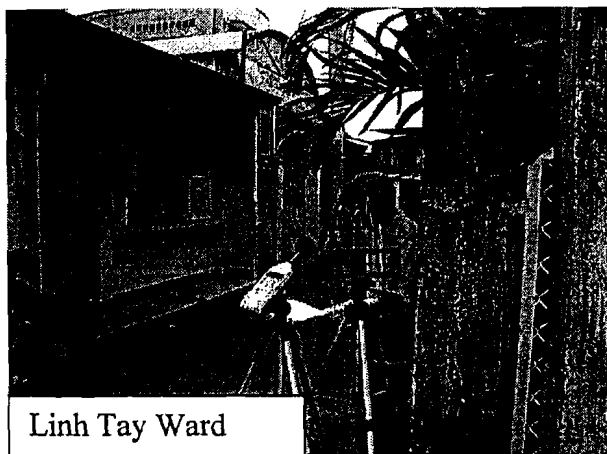
Figures of environmental sampling at Go Vap District



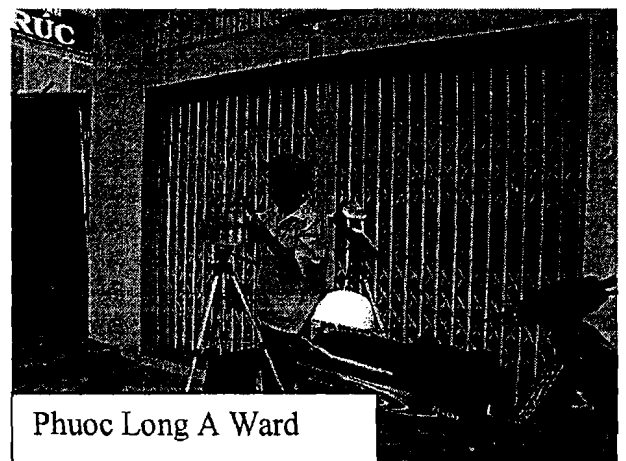
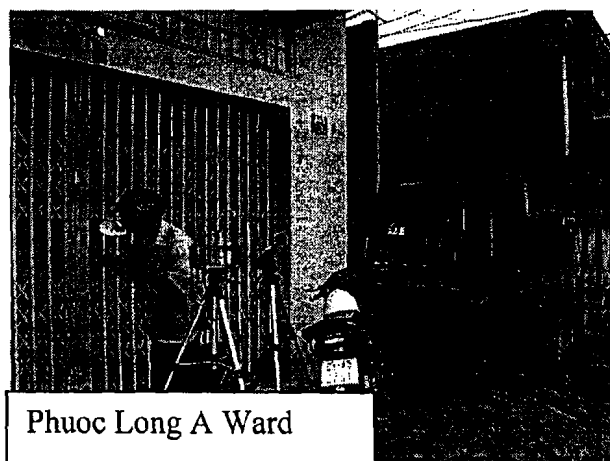
Figures of environmental sampling at District 12



Figures of environmental sampling at Binh Thanh District



Figures of environmental sampling at Thu Duc District



Figures of environmental sampling at District 9

HO CHI MINH CITY PEOPLE'S COMMITTEE
THE PMU OF HO CHI MINH CITY URBAN UPGRADING PROJECT

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VIET NAM URBAN UPGRADING PROJECT
HO CHI MINH CITY SUBPROJECT
COMPONENT 1 – PHASE 2

**ENVIRONMENTAL IMPACT ASSESSMENT
SUMMARY REPORT**

**SECTORAL PROJECT No.2
(COMPONENT 1 – PHASE 2)**

**TERTIARY INFRASTRUCTURE UPGRADING FOR LOW-
INCOME AREAS IN TAN HOA – LO GOM BASIN**

**GROUP 2:
FOR LOW INCOME AREAS IN DISTRICTS 9, 12, GO VAP, BINH
THANH, PHU NHUAN, AND THU DUC**

HO CHI MINH CITY, 01. 2008

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I. Introduction

Environmental Impact Assessment (EIA) of the Sectoral Project No.2 has been performed based on the information and the data collected up to 2006.

According to phase 2 task of the Sectoral Project No.2, EIA consultant will perform EIA report obeying requirements of Vietnamese Government and safe policies of World bank including Clause OP 4.01 on environmental impact assessment and Clause OP 4.11 on physical cultural heritage that may be affected by construction.

II. Objectives of Ho Chi Minh City Subproject

- Hunger eradication and poverty alleviation in urban areas
- Improvement of living and environmental conditions for low income communities and assistance for rearrangement of the city
- Soft loans for repairing houses and boosting income for the poor to be able to repay debts
- Assistance for municipal authorities' administration of houses and land for pushing forwards the grant of land use certificates (LUCs) to the poor

III. Scale and quantity of work of Sectoral Project No.2, Component 1, Phase 2, Group 2

Scale and quantity of work of Sectoral Project No.2, Component 1, Phase 2

Phase 2 includes upgrading tertiary infrastructure (that means alleys, drainage, electrical network and public lighting, etc.) of low income areas (LIAs) over 540 ha of 14 districts with 70,982 houses and 375,175 people as well as upgrading some grade-4 drainage systems which have been determined in the alleys that belong to the drainage region of Nhieu Loc – Thi Nghe. The regions to be upgraded in phase 2 can be divided into 3 groups as follows:

- Group 1 includes 17 LIAs of 5 districts: 4, 7, 8, Tan Phu, and Binh Tan.
- Group 2 includes 24 LIAs of 6 districts: 9, 12, Go Vap, Binh Thanh, Phu Nhuan, and Thu Duc.
- Group 3 includes 4-degree alleys of 5 districts: 1, 10, Binh Thanh, Phu Nhuan, and Tan Binh.

Investment content of the project include:

- Upgrading and raising up the road-bed
- Building and upgrading the drainage system
- Building and upgrading the water supplying system
- Installing and upgrading electricity system and lighting
- Installing fire hydrants

Scale and quantity of work of Component 1, Phase 2, Group 2

Scale and quantity of work of Component 1, Phase 2, Group 2 is presented in Table 1.

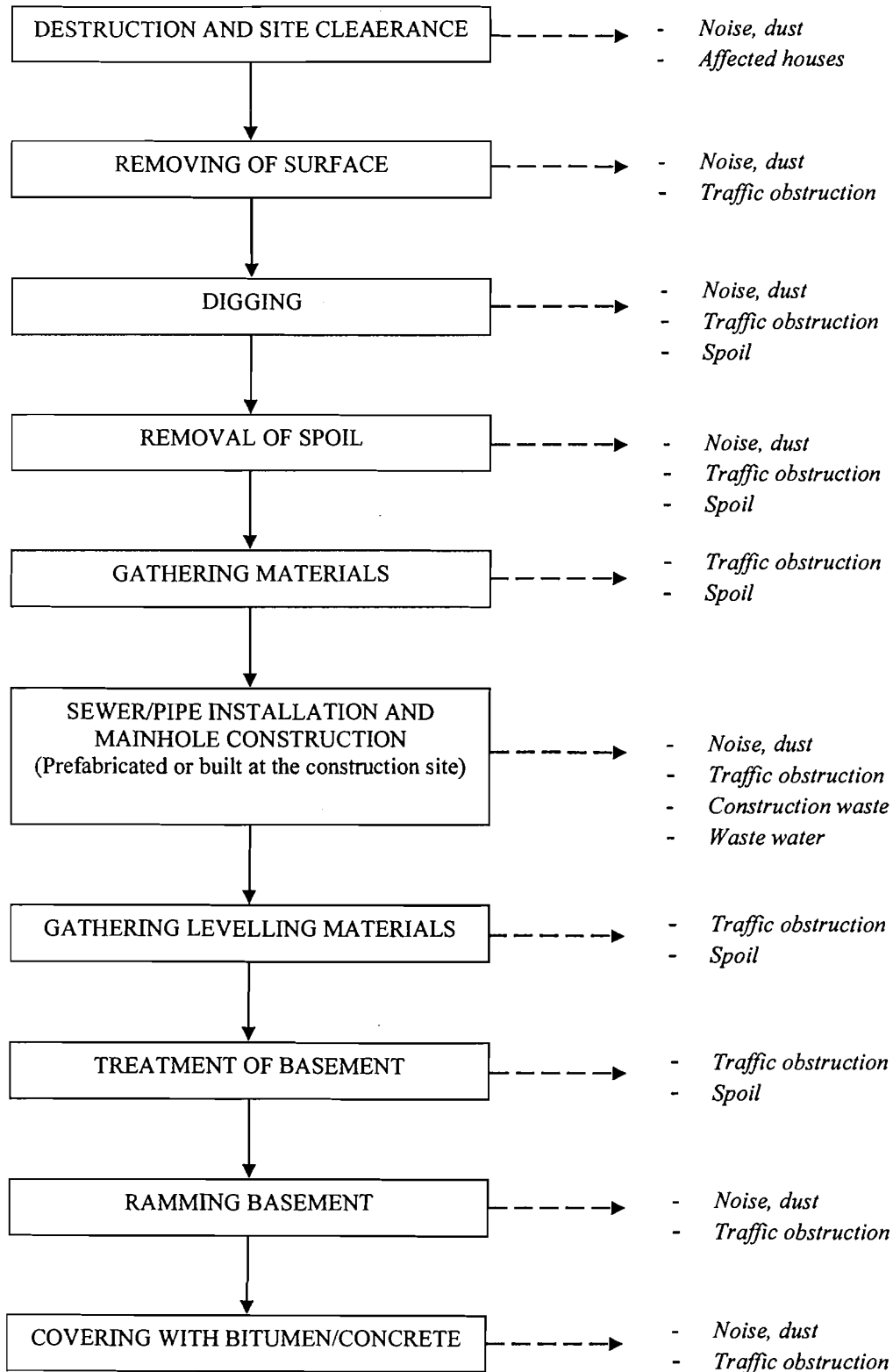
Table 1. Scale and quantity of work of Component 1, Phase 2, Group 2

| No | DISTRICT | UPGRADED AREA | UPGRADED ITEMS | | | | | | | | | | | | | | | | | | | |
|--------------|-------------|---------------|----------------|---------------|---------------|---------------|--------------|--------------|------------|------------|------------|---------------|-----------------|----------------------------|------------------------------|--|----------------------------------|------------------------------|--------------|---------------------|------------------------|--------------|
| | | | WATER SUPPLY | | | DRAINAGE | | | | | | TRANSPORT | | LIGHT & ELECTRICITY MOVING | | | | | FIRE-HYDRANT | WATER-CLOCK | | |
| | | | D50 (m) | D100 (m) | D150 (m) | D400 (m) | D600 (m) | D800 (m) | D1000 (m) | D1200 (m) | D1500 (m) | D2000 (m) | MAIN ALLEY (m2) | SUB-ALLEY (m2) | NEWLY INSTALLING LIGHT (SET) | NEWLY INSTALLING ELECTRICITY CABLE (m) | INSTALLING CONTROL STATION (PCS) | ELECTRICITY CABLE MOVING (m) | | GALVANO METER (PCS) | NEWLY INSTALLING (PCS) | MOVING (PCS) |
| 1 | DISTRICT 12 | 12.01 | | 2,997 | 911 | 1,529 | 1,152 | 252 | 148 | | | 8,712 | 12,037 | 149 | 4,475 | 6 | 3,373 | 198 | 4 | 874 | | |
| 2 | | 12.02 | | 1,470 | 1,500 | 664 | 219 | - | - | | | 2,112 | 4,263 | 37 | 2,248 | 4 | 1,800 | 52 | 5 | 361 | | |
| 3 | | 12.03 | | 501 | 242 | 374 | 171 | - | - | | | | 2,113 | 37 | 1,155 | 2 | 757 | 12 | 1 | 126 | | |
| 4 | | 12.04 | | 1,638 | 858 | 1,321 | 656 | 167 | 298 | | | 7,422 | 4,265 | 95 | 3,484 | 4 | 2,699 | 219 | 6 | 558 | | |
| 5 | | 12.05 | | 3,427 | 1,161 | 2,484 | 516 | 306 | 231 | | | 5,666 | 12,500 | 99 | 3,614 | 4 | 2,799 | 321 | 7 | 1,107 | | |
| 6 | | 12.06 | | 2,510 | 413 | 1,512 | 481 | - | - | | | 3,944 | 4,932 | 107 | 3,526 | 4 | 2,694 | 63 | - | 523 | | |
| 7 | | 12.07 | | 1,765 | 181 | 737 | 710 | 298 | 87 | | | 3,801 | 5,059 | 40 | 1,676 | 2 | 1,236 | 68 | 3 | 431 | | |
| 8 | | 12.08 | | 1,638 | 1,099 | 878 | 690 | - | - | | | 2,706 | 3,819 | 81 | 2,602 | 3 | 1,981 | 98 | - | 396 | | |
| 9 | | 12.09 | | 1,413 | 692 | 724 | 299 | 208 | - | | | 3,467 | 3,120 | 34 | 1,418 | 2 | 970 | 139 | 6 | 326 | | |
| 10 | GO VAP | GV.02 | 334 | 4,018 | 4,072 | 3,166 | 3,112 | 1,154 | 612 | 88 | 203 | 336 | 29,849 | 13,657 | 58 | 1,441 | 4 | 12,360 | 554 | 41 | 784 | |
| 11 | | GV.03 | | 754 | 430 | 569 | 283 | 66 | 89 | | | | 1,332 | 2,297 | 56 | 1,863 | 4 | 1,339 | 110 | | 265 | |
| 12 | | GV.04 | | 1,864 | 380 | 451 | 132 | | | | | | | 2,483 | 511 | 14,904 | 4 | 1,009 | 66 | | 240 | |
| 13 | PHU NHUAN | PN.01 | | | | 600 | | | | | | | 1,197 | | | | | 101 | | | 101 | |
| 14 | | PN.02 | | | | 799 | 204 | | | | | | 1,565 | 1,780 | 79 | 2,058 | 4 | 1,442 | 230 | | 230 | |
| 15 | | PN.03 | | | | | | | | | | | 1,041 | 1,086 | 45 | 1,354 | 2 | 824 | 110 | | 110 | |
| 16 | | PN.04 | | | | 180 | 102 | 130 | | | | | 1,951 | | 23 | 519 | 2 | 227 | 61 | | 61 | |
| 17 | | PN.05 | | | | 449 | - | 210 | 46 | 103 | | | 1,770 | 1,438 | 73 | 1,551 | 4 | 1,009 | 93 | | 93 | |
| 18 | BINH THANH | BT.02 | | | | 209 | | | | | | | 508 | 16 | 773 | 2 | 309 | 40 | | | 40 | |
| 19 | | BT.05 | | | | 400 | | | | | | | 1,521 | 57 | 1,708 | 4 | 1,030 | 49 | | | 49 | |
| 20 | | BT.07 | | | | 201 | 28 | | | | | | 600 | 16 | 769 | 2 | 355 | 24 | | | 24 | |
| 21 | THU DUC | TD.05 | | | | 813 | 359 | 97 | | | | 1,616 | 3,292 | 34 | 1,110 | 2 | 824 | 177 | 4 | | 177 | |
| 22 | | TD.06 | | | | 304 | 212 | | | | | | 1,235 | 37 | 1,069 | 3 | 721 | 26 | 3 | | 26 | |
| 23 | | TD.07 | | 130 | | 680 | 320 | 100 | | | | 2,320 | 1,768 | 28 | 777 | 2 | 515 | 159 | 2 | 50 | 159 | |
| 24 | | 09.02 | | 200 | | 2,170 | 650 | 800 | 70 | | | 6,801 | 5,496 | 68 | 1,864 | 4 | 1,442 | 482 | 9 | 50 | 482 | |
| TOTAL | | 334 | 24,325 | 11,939 | 21,214 | 10,296 | 3,788 | 1,581 | 191 | 203 | 336 | 86,075 | 90,466 | 1,780 | 55,958 | 74 | 41,715 | 3,452 | 91 | 6,091 | 1,552 | |

IV. Construction procedure

The project has 3 items to be upgraded, those include water supply, drainage and alleys together with public lighting. The procedure of construction of those items will include many steps which can be outlined by the general flow charts given as follows:

Figure 1. Procedure applicable to construction 3 main items



V. Environmental impacts and mitigation measures

After completion, the project will bring in the benefits as follows:

- (i) Improved electricity and water supply networks;
- (ii) Treated, cleaned and upgrade landscape and environment;
- (iii) Reduced diseases thanks to improved living conditions;
- (iv) Increased income as a result of increased working time thanks to better health;
- (v) Prevented floods and local waterlogging;
- (vi) Increased value of land use rights.

However, the construction and the operation of the project cause some negative impacts on the environment that is necessary to be cared and minimized as follows:

Table 2. Summarizing negative impacts and their mitigation measure of the project

| No. | Negative impacts | Impact assessment | Main mitigation measures |
|----------|--|---------------------------------|---|
| 1 | Pre-construction phase | | |
| 1.1 | Impacts on people living quality due to preparation for the project, removal and site clearance. | High and possible to mitigate | + Correctly performing the site clearance plan, and compensation and resettlement program of the project |
| 1.2 | Impacts on air quality due to site clearance. | High and possible to mitigate | + Monitoring and reminding people to cover up removal and construction sites. + The subcontractor cooperate and provide means for transporting spoil. + Watering roads |
| 2 | Construction phase | | |
| 2.1 | Dust from transport, construction and dust from construction sites | High and possible to mitigate | + Usually watering the roads and construction sites. + Building storage or temporary covering for storing the construction materials + Using movable iron sheet walls of at least 2 m height. + Covering the vehicles and avoiding to transport in rush hours |
| 2.2 | Noise from transport vehicles, machines and workers in construction sites | Medium and possible to mitigate | + Restriction of activities in nighttime. + Restriction of mechanical machines in sensitive objects such as schools and offices. + Use of only equipment and vehicles that meet the Vietnamese standards. |
| 2.3 | Emissions of vehicles and construction machines | Medium and possible to mitigate | + All construction machines and vehicles should meet the standard on emissions TCVN 6438:2001. |
| 2.4 | Wastewater from sites under construction | Medium and possible to mitigate | + Wastewater from construction sites will be pumped in existing sewers in the area or will be settled naturally in pits then rent specializing tank trucks to collect and discharge. + Domestic wastewater of construction worker: project will rent mobile restrooms of the city or use restrooms available in local people's houses. |
| 2.5 | Solid waste | Medium and possible to mitigate | + Solid waste from levelling and digging will be moved out of construction sites at the soonest and transported to suitable places or stored for reuse. + Construction waste should be gathered in specific zones then sold or disposed as regulated. + Domestic waste should be collected in closed tanks and contracts with local garbage collecting entities for daily collection. |
| 2.6 | Traffic obstruction since roads are used as construction sites | High and possible to mitigate | + Cooperation with local authorities for regulating traffic and establishing the temporary passages. + Providing signposts, flash lights and traffic measures |

| No. | Negative impacts | Impact assessment | Main mitigation measures |
|----------|--|----------------------------------|---|
| | | | <ul style="list-style-type: none"> + Roll-up construction + Transportation and supply of materials as scheduled in due time, out of rush hours + Maintaining the fences around big construction sites |
| 2.7 | Damages of roads | Medium and possible to mitigate. | <ul style="list-style-type: none"> + Checking up in term of road quality weekly and repaired if required throughout the construction. + Recovering the downgraded road after construction. |
| 2.8 | Damages to existing works | Medium and possible to mitigate | <ul style="list-style-type: none"> + Subcontractors should employ construction methods that cause lesser impacts and preventive measures. + Compensation satisfactory to people in case of incidents. |
| 2.9 | Leakage and spillage of oil/hazardous wastes to the project site | Medium and possible to mitigate | <ul style="list-style-type: none"> + Vehicles, pumps and equipment with significant oil leakage must be moved out of construction sites by means of specializing means and the spillage positions should be treated immediately. + Vehicles, pumps and equipment should not be repaired in construction sites. In opposite, they should be transported to repair zones. |
| 2.10 | Work accidents and incidents during construction | Medium and possible to mitigate | <ul style="list-style-type: none"> + Storage of fuel at construction sites should be prohibited. + All construction machines and vehicles should abide by the regulatory speed of 5km per hour. + Installing signposts and flash lamps in nighttime so as to avoid of accidents to motorcycles riders. + All electrical means and cables should meet safety standards and be checked regularly. |
| 3 | Operation phase | | |
| 3.1 | Impacts on the water environment | Medium and possible to mitigate | <ul style="list-style-type: none"> + Setting up teams for regular management and cleaning alleys. + Encouraging people's treatment of wastewater by means of septic tanks before discharge to common sewers + Periodically dredging of sewers and ditches. + Moving out or strictly controlling local companies and enterprises. |
| 3.2 | Impacts on the air environment and noise | Medium and possible to mitigate | <ul style="list-style-type: none"> + Moving out or strictly controlling local companies and enterprises causing much odour and noise. + Frequently cleaning roads to reduce dust and watering roads in the dry season for the same purpose. + Restricting heavy duty trucks; allowing on dump trucks that meet sanitary standard. + Encouraging families to plant trees in the surroundings of their houses |
| 3.3 | Solid waste | Medium and possible to mitigate | <ul style="list-style-type: none"> + Households storing and classifying refuse in dust bins (in plastic bags) before dump trucks come to take it away. + Educating people for better awareness of environmental protection. + Encouraging households to save materials and reduce the volume of solid waste. |

VI. Environmental monitoring program

The contents of the monitoring program include:

- Monitoring of characteristic parameters of air pollution and water pollution;
- Checkup of the implementation of countermeasures, mitigation of negative impacts on the environment and measures to control environmental pollution after the project is put into operation;
- Detections of risks of environmental deterioration to take countermeasures in due time;
- Checkup of efficiency of pollution treatment apparatuses and equipment;
- Determination of the strategy against pollution for protection of the environment.

Environmental monitoring program for Component 1, Phase 2, Group 2 is as follows:

Table 3. Environmental monitoring program for Component 1, Phase 2, Group 2

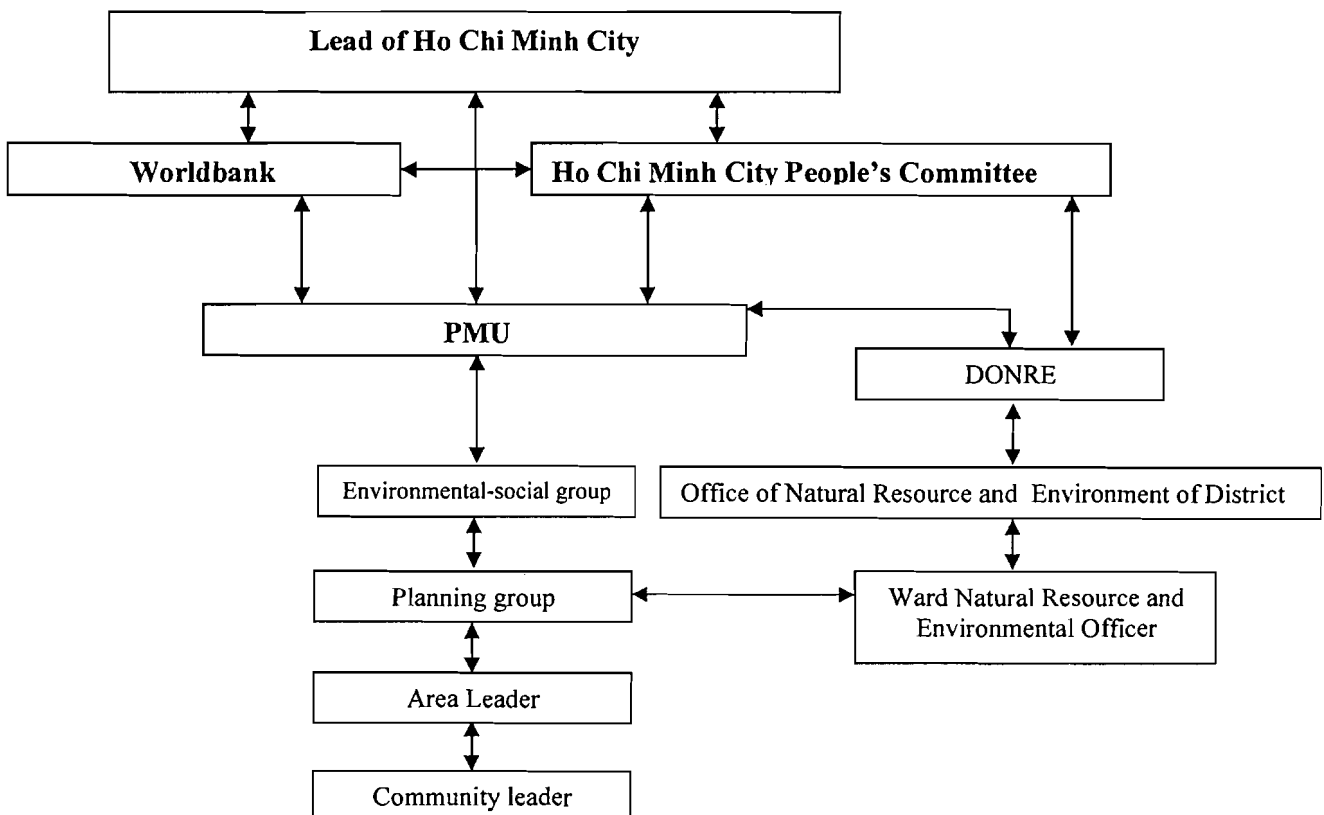
| Monitoring content | Parameters | Frequency | Number and position | Monitoring / implementation |
|---|---|---|---|--|
| I. PRE-CONSTRUCTION PHASE | | | | |
| 1.1 Noise and air quality | Noise, Dust, NO _x , SO _x , CO, THC, Microclimate | 02 courses /month | 2 sites/zone*24 zones*1sample/site = 48 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 1.2 Water supply quality | 8 parameters selected | 01 courses /month | 1 sites/zone *24 zones*1sample/site = 24 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 1.3 Surface water quality | 8 parameters selected | 01 courses /month | 3 points on Vam Thuat canal | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| II. CONSTRUCTION PHASE | | | | |
| 2.1 Checklist /auditing at construction sites | - Implementation of measures to control dust/air pollution, - Noise level, - Spillage of oil/hazardous waste, - Collection and storage of solid waste. - Overall sanitation | Weekly or in case of any people's complaint | All construction sites in 24 zones to be upgraded throughout the construction periods of each zone. | Monitoring engineers and Security, Environment and Health team (SEH) of Subcontractors |
| 2.2 Noise and air quality at construction sites | Noise and dust | 1 time/month or in case of any people's complaint | 2 sites/zone*24 zones *1sample/site = 48 samples | - <u>Monitoring</u> : Monitoring consultant - <u>Performing</u> : supervise consultant for construction or Subcontractor with functions of environmental monitoring |
| 2.3 Ambient noise and air quality | Noise, Dust, NO _x , SO _x , CO, THC, Microclimate | 2 times/year | 2 sites/zone*24 zones *1sample/site = 48 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 2.4 Water supply quality | 8 parameters selected | 2 times/year | 1 sites/zone *24 zones *1sample/site = 48 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 2.5 Wastewater at construction sites | pH, SS, COD, BOD ₅ , oil and fat, T. Colifoms | 2 times/year | 1 sites/zone *24 zones *1sample/site = 48 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 2.6 Surface | 8 parameters | 2 times/year | 3 points on Vam Thuat | - <u>Monitoring</u> : PMI |

| Monitoring content | Parameters | Frequency | Number and position | Monitoring / implementation |
|--|--|--|---|---|
| | | | construction in zone GV.02 | environment Company |
| 2.7 Emissions from construction machines | Noise, Dust, SO ₂ , NO ₂ | 2 times/year | 1 sample/equipment * 5 equipments = 5 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| III. OPERATION PHASE | | | | |
| 3.1 Ambient noise and air quality | Noise, Dust, NO _x , SO _x , CO, THC, Microclimate | 2 times/year (for 1 years after the project is put into operation) | 1 sites/zone * 24 zones = 24 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 3.2 Water supply quality | 8 parameters selected | 2 times/year (for 1 years after the project is put into operation) | 1 sites/zone * 24 zones = 24 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 3.3 Wastewater at soakage pits | pH, SS, COD, BOD ₅ , Oil and fat, T. Colifoms | 2 times/year (for 1 years after the project is put into operation) | 1 sites/zone * 24 zones = 24 samples | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |
| 3.4 Surface water | pH, SS, COD, BOD ₅ , Oil and fat, T. Colifoms | 2 times/year (for 1 years after the project is put into operation) | 03 sampling points on Vam Thuat canal | - <u>Monitoring</u> : PMU - <u>Performing</u> : Thang Long environment Company |

VII. Performance organization

Framework of organization of environmental monitoring for project is presented as follows. Similar to functional bodies and other organizations, the community is also determined to have responsibility for environmental monitoring.

Figure 2. Framework of organization of environmental monitoring for project



VIII. The Environmental Management Plan of the community

The Environmental Management Plan of the community will be realized for people in the project site to involve in environmental monitoring tasks. Detailed contents of the program are given in Table 4.

Table 4. Environmental Management Plan of the community

| Item | Content | Frequency | Method | In charge |
|--------------------------------|---|-------------|-------------|--|
| I | Construction phase | | | |
| Upgrading water supply systems | Spoil: - Monitoring of storage and transport of spoil. - Monitoring of inundation/refuse at holes. | 1 time/week | Observation | Community representative (leader or nominee) |
| | Traffic jam: - Monitoring of traffic jam. - Monitoring of arrangement of equipment in the construction site | Daily | Observation | Community representative, Households at the construction site. |
| | Society /safety: - Signboards, fences - Relationships between workers and inhabitants | Daily | Observation | Community representative, Households at the construction site. |
| Upgrading drainage | Spoil: - Monitoring of storage and transport of spoil. - Monitoring of inundation/refuse at holes. | 1 time/week | Observation | Community representative |
| | Traffic jam: - Monitoring of traffic jam. - Monitoring of arrangement of equipment in the construction site | Daily | Observation | Community representative, Households at the construction site. |
| | Wastewater: Monitoring of wastewater from the old drainage | Daily | Observation | Community representative, Households at the construction site. |
| | Noise | Nighttime | Observation | Households at the construction site. |
| | Society /safety: - Signboards, fences - Relationships between workers and inhabitants | Daily | Observation | Community representative, Households at the construction site. |
| Upgrading alleys | Dust/emissions: - Smoke, emissions from construction machines - Dust emitted from the construction site | Daily | Observation | Community representative, Households at the construction site. |
| | Noise | Nighttime | Observation | Households at the construction site. |
| | Traffic jam: - Monitoring of traffic jam. - Monitoring of arrangement of equipment in the construction site | | | Community representative, Households at the construction site. |

| Item | Content | Frequency | Method | In charge |
|---------------------------|---|---------------------------------|------------------------|---|
| II | Operation phase | | | |
| Water supply | Water quality | Daily | Observation | Households |
| | | In case of suspecting pollution | Sampling and analyzing | Community representatives in cooperation with functional bodies of districts. |
| | Water pressure | Daily | Observation | Households |
| Drainage | Accumulative mud: accumulation of mud in soakage pits | 6 months/time | Observation | Community representatives |
| | Choke of drains | 1 week/time | Observation | Community representatives Households |
| Collection of solid waste | Collection and transport of refuse from households | Daily | Observation | Community representatives Households |
| | Collection of refuse in public sites | Daily | Observation | Functional bodies of wards |
| Alley | - Traffic density - Traffic accidents | Daily | Observation | Community representatives Households |
| Air quality | Dust/emissions from vehicles | Daily | Observation | Households |
| | | 6 months/time | Quick measurement | Functional bodies of districts |
| | Noise | Daily | Observation | Households |
| | | 6 months/time | Quick measurement | Functional bodies of districts |

IX. Conclusion

Based on the study and assessment in details of environmental impacts of the Urban Upgrading Project, Component 1 – Phase 2, Group 2, the consultant drew some conclusions as follows:

- On completion, the project will make significant contribution into stabilization of people's living, political security and social discipline and order, improvement of living conditions and the environment of the zones in particularly and Ho Chi Minh City in general.
- The construction and long-term operation of the project are causative of some socio-economic and environmental negative impacts if there is no measure to prevent, control and treat environmental pollution.
- Starting from full awareness of responsibility in environmental protection, the project will invest sufficiently in environmental protection activities and undertake to seriously realize the plans for prevention, control and treatment of environmental pollution as given in this EIA report so as to meet all the Vietnamese Environmental Standards as regulated.
- The PMU will cooperate with functional bodies in the processes of technical design and construction in order to meet the environmental standards as regulated as well as avoid of environmental incidents.
- Measures to control pollution and restrict negative impacts of the project on the environment, which have been recommended in this EIA report, are feasible to meet valid Vietnamese Environmental Standards.