Initial Environment Examination

Project Number: 46391-001
June 2016

VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project

Prepared by Ho Chi Minh City Power Corporation for the Asian Development Bank.

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Loan 3161-VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project

EVN HCMC: 110kV Thu Duc water plant substation and connection line

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ABBREVIATIONS

ADB:	Asian Development Bank
AH:	Affected Household
AP:	Affected people
BOD:	Biochemical Oxygen Demand
CEMP:	Contractor Environmental Monitoring Plan
COD:	Chemical Oxygen Demand
DARD:	Department of Agriculture and Rural Development
DoNRE:	Department of Natural Resources and Environment
DCST:	Department of Culture, Sports and Tourism
DoLISA:	Department of Labour, War Invalids and Social Affairs
EA:	Executing Agency
EIA:	Environment Impact Assessment
EMP:	Environment Management Plan
EVN:	Viet Nam Electricity
EVNHCMC:	Ho Chi Minh Power Corporation
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
HCMC:	Ho Chi Minh City
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MARD:	Ministry of Agriculture and Rural Development
MoLISA	Ministry of Labour, Invalids and Social Affairs
MoNRE:	Ministry of Natural Resources and Environment
NPA:	National Protected Area
PCB:	Polychlorinated biphenyls
PCR:	Physical Cultural Resources
PIC:	Project Implementation Consultant
PPC:	Provincial Peoples Committee
PPMB:	Power Project Management Board
PECC4:	Power Engineering Consulting Joint Stock Company 4
REA:	Rapid Environment Assessment
ROW:	Right-of-way
S/S:	Substation
T/L:	Transmission line
TSS:	Total Suspended Solids
UGC:	Underground cable
UXO:	Unexploded Ordnance

CURRENCIES

(Rate of exchange of 30 December. 2015)

Currency Unit	–	VND
$1.00	=	22,280 VND

NOTE

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

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INDEX

LIST OF TABLE

LIST OF FIGURES

EXECUTIVE SUMMARY

1. The Project, financed through Asian Development Bank's (ADB) sector loan modality, will strengthen the capacity and reliability of the power infrastructure in Ha Noi and Ho Chi Minh City through the rehabilitation and development of the 110 kV and 220 kV substation and power transmission to supply their medium voltage (MV) distribution system. The Project will also strengthen the institutional capacities of Ho Chi Minh City Power Corporation (EVNHCMC), which is responsible for the power supply in its respective areas.

2. The Initial Environmental Examination (IEE) presented herein is of 110 kV Thu Duc water plant Substation and connection line subproject in HCMC which is one of 29 non-core subprojects of Viet Nam Electricity (EVN) proposed by Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). These 29 non-core subprojects were classified Category B for environment. The subproject consists of construction of a new 110 kV substation, and a new 50m underground cable (UGC). The IEEs of the other non-core subprojects have been prepared separately.

A. Subproject Summary

3. 110kV Thu Duc water plant substation and connection line consists of a new 110 kV substation, and 50m underground cable. The substation will be located within the boundary of Thu Duc B.O.O water plant, in Linh Trung ward, Thu Duc district, HCMC. The underground cable will be started from the new tower which will be constructed at the span 44A and 45A of the 110kV Thu Duc - Binh An transmission line. The UGC then will go to the busbar of the 110kV Thu Duc water plant substation. This UGC is also within the area that is proposed to acquire to construction the 110kV Thu Duc water plant substation.

4. The 110 kV Thu Duc water plant substation will be constructed to supply power to the load demand of Area No.3 in cluding District 2, District 9, Thu Duc district and a part of Binh Thanh district; mainly supply power to Thu Duc Water Plants, High Technology Industrial Park and neibouring load areas; mutually supporting to 110kV transformers of 220kV Thu Duc substation, 110kV Northern Thu Duc substation, Linh Trung 1 and Linh Trung 2 substations when happening incidents.

B. Potential Impacts and Mitigations

5. The IEE of 110 kV Thu Duc water plant Substation and connection line indicates that the potential environmental impacts of the subproject are mainly occurred in the construction phase of the subproject components and operation of the transformer. The common construction-related disturbances such as noise, dust, erosion, sedimentation, solid and liquid waste pollution, worker camp issues, reduced access, increased vehicle and traffic disruptions, increased risk of worker and public injury can be managed with standard construction practices and management guidelines (e.g., IFC/World Bank 2007). The impacts due to operation of the transformer are restricted to hazardous waste from transformer oil and related things. After the field survey, interview, consultation, the subproject doesn't cross over any National Park, Nature Reserve or area planned for Nature Reserve. There are no rare or endangered wildlife, critical habitats or protected areas in the subproject site.

6. Only commercial land which belongs to Thu Duc B.O.O Water Company will be permanently and temporarily lost due to the subproject. The permanently acquired land will be 4,077 m2, including (i) 3,816 m2 for constructing the substation, and (ii) 261 m2 access road.

7. The lost land and compensation is addressed in detail in the Resettlement Due Diligence Document (RDDD) prepared under separate cover.

8. The construction-related disturbances to the environment and community concern the short-term disturbances caused by constructing the new substation and transmission line. The impacts due to hazardous waste during operation of the substation will only happen

within the substation area. No cumulative environmental impacts will be occurred. Mitigation measures for these impacts are stated in details in Part VII of this report.

9. The Environmental Management Plan (EMP) prepared for the subproject provides comprehensive impacts, Mitigation Plan and Environmental Monitoring Plan to minimize and manage the potential impacts of the subproject. The EMP also prescribes an Emergency Response Plan for the construction sites and identifies the need for capacity development and training of the IA/EO (belonging to the PMB) in environmental management and assessment as focused on the implementation of the EMP.

C. Conclusions

10. The IEE concludes that the feasibility study of the subproject combined with available information on affected environments is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes to the subproject description do not occur at the detailed design phase, and that new sensitive environmental, or cultural resources are not determined, further detailed environmental impact assessment (EIA) is not required.

II. INTRODUCTION

A. Background to IEE

11. Ha Noi and Ho Chi Minh City Power Grid Development aims to strengthen the capacity and reliability of the power infrastructure in Ha Noi and Ho Chi Minh City, Viet Nam through the rehabilitation and development of the 220 kilovolt (kV) and 110 kV high-voltage power transmission systems and substations and associate to medium voltage supply the power distribution system of the two cities. The Project also aims to strengthen the institutional capacity of Ha Noi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

12. The Project in Ho Chi Minh City and Ha Noi consists of 29 non-core subprojects that were originally defined by Viet Nam Electricity (EVN).

13. This IEE is prepared for the new-constructed subproject of 110 kV Thu Duc water plant substation and connection line in Thu Duc District, Ho Chi Minh City. The IEEs of the other non-core subprojects are prepared in separate volumes.

B. Assessment Context

14. The subproject was classified Environmental Category B under the ADB's Safeguard Policy Safeguard Policy Statement-2009 and ADB Environmental Safeguards, A Good Practice Sourcebook, 2012. A category B project will have potential adverse impacts that are less adverse than the impacts of category A project, are site-specific, largely reversible, and can be mitigated with an environmental management plan.

15. This IEE was prepared for 110kV Thu Duc water plant substation and connection line subproject in the feasibility study stage, using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

16. The 110 kV Thu Duc water plant substation and connection line subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by GoV Decree No. 38/2013/ND-CP of April 23rd 2013 on management and use of Official Development Assistance (ODA) and concessional loans of Donors, and in accordance with the provisions of the Project.

A. Viet Nam Regulatory Framework for Environmental Assessment

17. The Viet Nam Law on Environmental Protection (LEP 2014) prescribes the requirements for environmental assessment for development and domestic project interventions that affect the natural and social environments.

B. Applicable Environmental Laws, Policy, Environmental Standards, and Guidelines

18. The following are key directives for environmental assessment and protection in Viet Nam:

**** Legal foundations on environment protection***

- Law on Environmental Protection No. 55/2014/QH13 passed by the National Assembly dated June 23, 2014;
- Decree No. 19/2015/ND-CP dated February 14, 2015 of the government on detailing the implementation of some Articles of the Law on Environmental Protection;

- Decree No. 18/2015/ND-CP dated February 14, 2015 of the government on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment;
- Decree No. 179/2013/ND-CP dated November 14, 2013 of the Government, on the sanction of administrative violations in the domain of environmental protection;
- Decree No. 38/2015/ND-CP dated April 24, 2015 of the Government on management of waste and discarded materials;.
- Circular No.27/2015/TT-BTNMT dated on 29 May 2015 on strategy environmental assessment, environmental impact assessment, and environmental protection plan.

**** Legal foundations on Electricity***

- Electricity Law No. 28/2004/QH11 dated December 03, 2004;
- Amended Electricity Law No. 24/2012/QH13, passed by the National Assembly dated November 20, 2012, in effect on July 01, 2013;
- Decree No. 14/2014/NĐ-CP dated February 26, 2014 of the Government, providing details on implementing the Electricity Law on power safety, in effect on April 15, 2014;
- Decree No. 134/2013/NĐ-CP dated October 17, 2013 of the Government, providing penalty on administrative violations in Electricity sector, hydropower dam safety, using energy economically and effectively.

**** Other related legal foundations:***

- Decree No. 45/2013/ND-CP dated May 10, 2013 of the Government, elaborating a number of articles of the labor code on hours of work, hours of rest, occupational safety and occupational hygiene.
- Circular No. 22/2010/TT-BXD dated December 3, 2010 of the Ministry of Construction, providing on labor safety in works construction;
- Decision No.3733/2002/QĐ-BYT issued by the Ministry of Healthcare dated October 10, 2002 about the Application of 21 Labor Health and Safety Standards.
- Decision No.155/1999/QĐ-TTg dated July 16, 1999 of the Government on Promulgation of the Management Mechanism for Hazardous Waste.
- Decision No.505 BYT/QĐ dated April 13, 1992 of the Ministry of Healthcare on the Regulation for Allowed Concentrations.

Environmental codes and standards

- QCVN 05:2013/BTNMT – National technical regulation on quality of ambient air;
- QCVN 26:2010/BTNMT – National technical regulation on noise.
- QCVN 27:2010/BTNMT – National technical regulation on vibration ..
- QCVN 08:2008/BTNMT - National technical regulation on quality of surface water.
- QCVN 09:2008/BTNMT - National technical regulation on quality of groundwater.
- QCVN 14:2008/BTNMT - National technical regulation on quality of domestic wastewater.
- QCVN 01:2008/BCT: National technical regulation on electricity safety.

International Guidelines

- World Bank Group, 2007. Environmental Health and Safety Guidelines, Wash. DC.

International Environmental Management Conventions

19. Viet Nam is signatory to the following relevant international conventions:

- 1973, Convention on International Trade in Endangered Species Wild Fauna and Flora.
- 1992, United Nations Framework Convention on Climate Change.
- 1992, Convention on Biological Diversity

Directives of Electricity Industry in Viet Nam and Information for Thu Duc water plant 110kV Substation

20. The documents for Thu Duc water plant 110kV Substation and connection line are:

- Decision No. 6493/QD-BCT dated December 09, 2010, approving the Electricity Development Master plan of HCMC in period 2015 to 2020.
- Letter No. 431/CV-TCT-KTCN dated February 06, 2013 of Sai Gon Water Supply Corporation on receiving land assignment for constructing 110kV Substation for the Water Plants Complex in Thu Duc area.
- Letter No. 25/2014/CV-TDW dated June 17, 2014 of B.O.O Thu Duc Water Joint Stock Company on informing the underground works at the area proposed constructing the Thu Duc Water Plant 110kV Substation.
- Decision No. 3344/QĐ-BCT dated 7 April 2015 of MOIT on approval of amendment and supplementation electric development master plan of Ho Chi Minh City in stage of 2011-2015, consider to 2020;

C. ADB Safeguard Policy

21. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the recent good safeguard practice sourcebook clarify the rationale, scope and content of an PO and supported by technical guidelines (e.g., Environmental Assessment Guidelines 2003). Projects are initially screened to determine the level of assessment that is required according to the following three environmental categories (A, B, or C):

- **Category A** is assigned to projects that normally cause significant or major environmental impacts that are irreversible, diverse or unprecedented such as hydroelectric dams (an Environmental Impact Assessment is required);
- **Category B** projects have potential adverse impacts that are less adverse than those of category A, are site-specific, largely reversible, and for which mitigation measures can be designed more readily than for category A projects (an Initial Environmental Examination is required);
- **Category C** projects are likely to have minimal or no negative environmental impacts. An environmental assessment for Category C projects is not required but environmental implications need to be reviewed.

22. The 110kV Thu Duc water plant substation and connection line is assessed into category B which is necessary to prepare an IEE. Appendix A presents the Rapid Environmental Assessment (REA) of the substation and connection line.

IV. DESCRIPTION OF THE SUBPROJECT

23. The 110KV Thu Duc water plant Substation non-core subproject consists of two major components that are a new 110kV substation, 25m of UGC.

1. The 110 kV substation

24. The 110 kV substation will be constructed to supply power to the load demand of Area No.3 in cluding District 2, District 9, Thu Duc district and a part of Binh Thanh district. The substation infrastructure will be located in the scope of vacant land area within the boundary of Thu Duc B.O.O Water Company. Technical specification of the substation is described as Table 1:

Table 1. Technical parameters of Thu Duc Water Plant 110 kV Substation

No.	Specifications	Parameters
1	Voltage level	110/22kV
2	Substation capacity, MVA	02x40MVA = 80 MVA, in the first stage, installing of 02 transformers 40 MVA.
3	The area within the substation fence	3,816m^2
4	Auxiliary transformer	2 auxiliary transformers installed at 22kV side with each capacity 160kVA
5	Emergency oil tank	36 m^3
6	Fire fighting tank	80m^3
7	Internal roads	3.5m x 20m and 4.5m x 186m
8	External road	4.5m x 58m
9	Gate and fence	Length 250m

2. The underground cable

25. The 110kV UGC transmission line will be newly constructing to supply power to the Thu Duc Water Plant 110kV Substation. The Substation will be transit-connected 1 circuit into the Double circuits 110kV Thu Duc – Binh An transmission line. The connection position will be at the UGC pole, directly suspended 02 circuits, newly constructing just under the center line of the 04 circuits 220-110kV transmission line (02 circuits 220kV Thu Duc – Long Binh, 02 circuits 110kV Thu Duc – Binh An), within the tower span 44A – 45A (far from tower 44A of 64m, far from tower 45A of 264m). The 110kV UGC Transmission Line has the following parameters (Table 2):

Table2: Technical parameters of the 110kV UGC transmission line

▪ Voltage level	: 110kV
▪ Number f circuits	: 2 circuits
▪ Length	: 50m
▪ Starting point	: Connection tower 44B, Double circuits 110kV Thu Duc – Binh An transmission line.
▪ Ending point	: 110kV busbar of theThu Duc Water Plant 110kV Substation.
▪ UGC	: XLPE 1200mm^2.
▪ Insulator	: Ceramic or glass, types: 70kN, 160kN
▪ Pole	: Single body steel pole 2 circuits, hot-dip galvanized.
▪ Foundation	: In-situ cast concrete foundation
▪ Earthing	: Radial type, galvanized steel wire Ø12.

Location of the 110kV Thu Duc water plant substation and connection line is presented in the Figure 1

Figure 1 2: Proposed site of Thu Duc Water Plant 110kV Substation and connection line (red line)

3. Construction works

a. Civil work volume

26. Main civil work volume of 110kV Thu Duc water plant substation and connection is detailed in Table 3:

Table 3 : Main civil work volume

No.	Work contents	Unit	Quantity
A	**Substation**		
1.	Excavated soil	m^3	4732
2.	Filled back soil	m^3	5232
3.	Iron and steel	ton	133.6
4.	Reinforced concrete	m^3	1090
5.	Reinforced concrete poles	m	4080
6.	Internal road	m	266
7.	Access road	m	40
8.	Control house (base ground, ground and first floor)	pcs.	01
9.	Pumping station	pcs.	01
10.	Emergency oil tank	pcs.	01
11.	Firefighting tank	pcs.	02
12.	Water drainage system	system	01
13.	Fire protection and fighting system	system	01
14.	Transformer - 63MVA	pcs.	02
15.	Auxiliary transformer - 160kVA	pcs.	02
16.	22kV capacitor gantry	set	02
17.	Installation of equipment for 110kV transmission line bay	bay	02
18.	Installation of equipment for 110kV segment	bay	01

No.	Work contents	Unit	Quantity
19.	Installation of equipment for 110kV transformer	bay	02
20.	Monitoring camera system	system	01
21.	Fire protection and fighting system	system	01
22.	Communication information and SCADA system	system	01
23.	Control and protection system in PC	system	01
24.	Fence + gate of substation	m	250
B	**Connection line**		
1	Excavated soil	m^3	46.74
2	Filled back soil	m^3	1682.34
3	Fill concrete for foundation	m^3	385.57
4	Processing foundation by reinforced	ton	16.289
5	Processing foundation by planking	m^2	131.58
6	Processing reinforced	ton	141.70
7	Tower erection	ton	141.70
8	Transporting tower	ton	141.70
9	grounding for tower	set	12
10	Installing warning board	set	12
11	Pulling conductors	km	15.8
12	Pulling resist-lighting wire	km	2.58
13	Pulling optical fiber	km	2.59
14	Installing insulation	set	156

b. Construction methods

**** The substation construction:***

27. The substation construction include the following items:

- Substation's ground leveling: ground is filled by soil and sand which will be compacted by bulldozers at the coefficient of compaction k= 0.98. Table 3 shows that volume of filled sand and soil is 5,232m^3 for substation and 1,682.34 m^3 for connection line. 70% of the volume will be taken from excavated soil and sand, the other (about 2,000 m^3) will be bought locally from construction material providers
- Earthwork: foundations of control houses, water tanks, walls will be excavated by machines while other items with smaller volume of excavated will be performed by manual.
- Transformer foundation will be filled by reinforced concrete with stable level at B15 (M200). The foundation will be consolidate by reinforced concrete stakes (M300)
- Access road and internal road will be compacted by bulldozers with the compacted coefficient of $K \geq 0.95$
- Breakdown oil tank: reinforced concrete tanks made of durable B15 levels (M200) placed underground substation platform.
- Outdoor cable ditch: buried cable ditch made of durable B15 levels (M200), lining the bottom with durable B7.5 level (M100) and was sloped towards the water sump
- Other items were built under the provisions of law and the current construction standards.

* **The connection line construction**

28. Foundation of the new tower and cable ditch (50m long) will be constructed by excavation method which is under design drawings and complies with current regulations. After the concrete is finished and refilled. Refilled soil has to be compacted in layers and the correct size as the design drawings. The refilled soil taken from excavated soil. Reinforced concrete piles with 250 x 250 in square cross section and 20m long are used to make pile-foundation.

29. The tower erection: the tower will be transported into the proposed position by 25-ton and ≥60m-reach crane.

c. Material demand and supply sources

30. Materials and equipment for the subproject's construction are expected to take from the following sources:

- Sand (for leveling), gravel, cement will be bought locally.
- Reinforced foundations, grounding: taken locally and processed at the site.
- Coated steel and bolt types: taken at the processing facility in Thu Duc -TP.HCM.
- Wire, fittings, insulation, and equipment: Storage warehouse of PMB or contractors according to this category by one grade.

31. The transport of supplies and equipment is expected to be carried out as follows:

- Purchasing power equipment: transport by road, distance of 30km.
- Coated steel, bolts: transport by road, distance of 30km
- Transportation of transformers: transported by road on specialized trailers from Sai Gon port to position of the substation about 20km distance.

d. Waste treatment

32. Domestic waste of workers will be collected into the garbage container. Construction contractors will contract with the specialized unit (e.g. HCMC Urban Environment Co., Ltd.) to disposal and treatment.

33. No disposal site need to be arranged for the subproject because all excavated soil will be used to refill the substation level and foundations, see table 3. The substation ground is quite low, thus about 2,000 m^3 of soil and sand will be needed to be filled to make higher ground. The constructor will find the material provider when they start the construction work. Other construction waste like cement bags, clouts etc. will be classified to treat as in the Figure 2

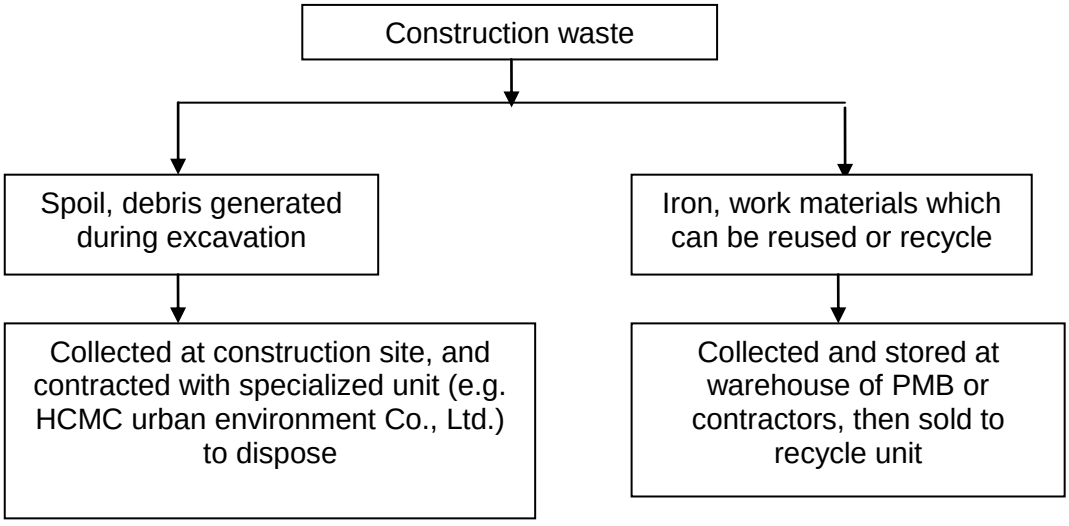

Figure 2 Management of construction waste

V. DESCRIPTION OF AFFECTED ENVIRONMENT

34. The environmental baseline information was obtained primarily from HCMC Statistical Yearbooks, state of the environment reports (SoER) prepared by HCMC DoNRE, reports from PECC4, and supplemented from the literature including other EAs conducted for the same area. The description of affected environments focuses on natural features and land use.

A. Physical Environment

1. Climate

35. The subproject area is situated in the Southern Climate Zone which is typified by a tropical monsoon climate characterised by high temperatures with very little seasonal variation, and to be summarized as below.

a. *Temperature*

36. Air temperature is high and changes little in year-round. Annual average temperature is 26 – 28^{o}C, difference between the hottest month and the coldest month is about 3 – 4^{o}C. Average temperature in the coldest month is above 24^{o}C (Table 4).

Table 4: Temperature regime at Tan Son Nhat and Tan Son Hoa Meteorological Stations

Station	Feature	Months, year												
		Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Tan Son Nhat (long-term average)	T_{max} ^{o}C	36.4	38.7	39.4	40.0	39.0	37.5	35.2	35.0	35.3	34.9	35.0	36.3	40.0
	T_{min} ^{o}C	13.8	16.0	17.4	20.0	20.0	19.0	16.2	20.0	16.3	16.5	15.9	13.9	13.8
	$T_{average}$ ^{o}C	26.0	26.8	28.0	29.2	28.8	27.8	27.5	27.4	27.2	27.0	26.7	26.0	27.4
Tan Son Hoa (2011)	$T_{average}$ ^{o}C	26.9	27.6	28.3	29.11	29.5	28.5	27.9	28.4	28.1	28.1	28.1	27.2	28.1

(Source: Data of Tan Son Nhat station referred to National technical regulation on natural condition data in construction _QCVN 02:2009/BXD; data of Tan Son Hoa station referred to the statistic yearbook 2011 of HCMC)

37. According to the report of the Working Group on Climate Change and Development, (2007), in the Mekong region (Ho Chi Minh City) average temperatures over the last century have risen between 0.3 to 0.8°C. Further temperature increases are expected along with more extreme weather events, such as floods and droughts, changes in the amount and distribution of rainfall, disruption of seasonal monsoons, and rising sea levels.

b. Sunlight hours

38. Average number of sunlight hours in Ho Chi Minh City is fairly high as compared with many other provinces in the country. Number of sunlight hours in a year is of 1800 - 2500 hours or more. Table 5 shows the average number of sunlight hours observed in Tan Son Hoa and Tan Son Nhat meteorological station.

Table5: Average number of sunlight hours

Station	Months, year (hour)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Tan Son Nhat	245	246	272	239	195	171	180	172	162	182	200	226	2489
Tan Son Hoa (2011)	120.1	188.9	157.8	187.0	165.0	163.6	162.6	198.1	144.8	154.3	141.0	109.7	1892.2

(Source: Data of Tan Son Nhat station referred to National technical regulation on natural condition data in construction _QCVN 02:2009/BXD; data of Tan Son Hoa station referred to the statistic yearbook 2011 of HCMC)

c. Humidity and Rainfall

39. The area is humid and there is little difference in rainfall between the monsoon seasons. Annual average humidity is about 78% - 82 %. Rainfall regime is divided into the separated two reasons such as rain season from May to October and dry season from November to the next year's April. Maximum rainfall in the region is 200 mm per day. Total annual average rainfall in the region is from 1800 mm to 2000 mm (see Table 6).

Table 6: Monthly and annual average rainfall and Humidity in Tan Son Nhat Station

Parameters	Months, year (mm)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	Year
Rainfall	12	4	13	51	207	294	307	281	305	291	135	28	1926
Humidity(%)	72.0	70.0	70.0	72.0	79.0	82.0	83.0	83.0	85.0	84.0	80.0	77.0	78.0
Humidity(%)	23	22	20	21	26	30	40	44	43	40	33	29	20

(Source: Data of Tan Son Nhat station referred to national technical regulation on natural condition data in construction _QCVN 02:2009/BXD; data of Tan Son Hoa station %, statistic yearbook 2011 of HCMC)

d. Wind velocity

40. From November to April, the wind is mainly from the northeast and dry while from May to October the wind is mainly from the southwest and brings heavy rainfall to the low-lying plains and eastern slopes of the Truong Son Mountains. The annual average wind speed recorded at Tan Son Nhat is 2.8 m/s. The high number of thunderstorm days is mainly in the rainy season from May to October (Table 7).

Table 7: Wind velocity and number of thunderstorm-days in Tan Son Nhat station

Parameters	**Months, year**												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Wind velocity (m/s)	2.3	3.1	3.6	3.3	2.5	2.7	2.9	3.8	2.7	2.2	2.2	2.0	2.8 (average)
Number of thunderstorm-days (day)	0.0	0.3	0.2	2.0	11.0	8.0	13.0	9.0	9.0	8.0	6.0	1.0	67.5 (total)

(Source: National technical regulation on natural condition data in construction _QCVN 02:2009/BXD)

2. Air quality

41. Air quality in HCMC has been monitored frequently and almost focused on pollutants due to traffic activity. The monitoring has been conducted at 6 stations located in the

territory of Ho Chi Minh city, including Dinh Tien Hoang – Dien Bien Phu, An Suong, Go Vap, Hang Xanh, Nguyen Van Linh – Huynh Tan Phat (District 8), and Phu Lam stations. The monitoring results in 2012 and the first half of 2013 are presented in Table 8.

Table 8: Air pollutants measured in the 6 stations in 2012 and the first half of 2013

		Hang Xanh	DTH-DBP	Phu Lam	An Suong[1]	Go Vap	HTP-NVL
CO (mg/m^3)	Average 2012	9.7	12.77	8.78	11.79	14.47	8.76
	% Samples over standard	1%	2%	0%	2%	1%	1%
	Average first half 2013	10.48	13.47	10.06	12.94	16.4	9.64
	% Samples over standard	0%	0%	0%	0%	3%	0%
particle content (mg/m^3)	Average 2012	0.44	0.53	0.51	0.65	0.5	0.51
	% Samples over standard	95%	98%	99%	100%	95%	91%
	Average first half 2013	0.43	0.46	0.51	0.61	0.5	0.52
	% Samples over standard	85%	98%	98%	100%	98%	88%
Lead (mg/m^3)	Average 2012	0.28	0.32	0.28	0.32	0.28	0.31
	Average first half 2013	0.32	0.36	0.33	0.39	0.3	0.34
NO_2 (mg/m^3)	Average 2012	0.17	0.21	0.18	0.21	0.18	0.17
	Average first half 2013	0.15	0.19	0.17	0.2	0.17	0.17
Noise (mg/m^3)	Average 2012	77.89	78.49	76.97	80.14	77.89	77.3
	% Samples over standard	100%	100%	100%	100%	100%	98%

(Source: Reports on monitoring results of environmental quality in HCMC in 2012 and the first half of 2013, by Environmental Monitoring and Analysis Center – DONRE of HCMC)

42. Noise is the most polluting factor in HCMC's roads, with 100% of the measured values exceeding the standard limit, fluctuating from 77 to 80dB (measured in 2012), 71-88dB (measured in the first half of 2013).

43. The second pollutant is dust which is also a serious concern in the monitoring program. In 2012, the measured values at the 6 stations were from 0.44 – 0.65mg/m^3, with 96% of them over the permitted standard of 0.30mg/m^3. However, in comparison to the figures of 2011 and 2010, dust concentration tends to reduce. In the first half of 2013, the concentration of dust was measured from 0.43 – 0.61 mg/m^3, with 95% over the standard.

44. NO_2 content was 0.17 – 0.21 mg/m^3 in 2012, and 0.15-0.20 mg/m^3 in the first 6 months of 2013. Overall, this content has been declined during the period from 2010 to half of 2013.CO and Pb content measured in 2012 met the standard level and lesser than in 2011 and 2010, while these figures increased in the first half of 2013.

45. Air quality in the subproject area was measured by the South environment and meteo-hydrology Branch and PECC4 in November 2014. The results show that air quality in the area is relatively good because most of analyzed parameters are under the permitted levels in QCVN 05:2009/BTNMT. However, noise at one point (KK1) is higher than the permitted level at QCVN 26:2010/BTNMT (see Table 9):

[1] An Suong station is nearest to project site located 1.5 km north at An Suong intersection, District 12.

Table 9: Analyzed results of air quality in the subproject site

No	Parameter	Analyzed Method	Unit	Result			QCVN 26:2010/BTNMT (6-21 hours)	QCVN 05:2009 /BTNMT
				KK1	KK2	KK3		
1	Noise	Q2900E Quest-USA	dB	54,2	56,9	60,1	70	-
2	Total suspended particular (TSP)	TCVN 5067-1995	mg/m^3	0,11	0,11	0,13		0.3
3	Particle ≤ 10 µm (PM10)	TCVN 5067-1995	mg/m^3	0,004	0,003	0,007		-
4	SO_2	TCVN 5971-1995	mg/m^3	0,020	0,019	0,022		0.35
5	NO_2	TCVN 6137-1996	mg/m^3	0,013	0,014	0,016		0.2
6	CO	52 TCN 352-1989	mg/m^3	3,10	3,13	3,57		30
7	O3	TQKT – YHLĐ and VSMT 1993	mg/m^3	KPH	KPH	KPH		0.18
8	Pb	SMEWW 3500-2005	$\mu g/m^3$	0,005	0,004	0,004		-

(Source: The south environment and meteo-hydrology sub-institute, November/2014)

KK1: The proposed site of construction of the Thu Duc water plant 110kV substation and connection line (X: 612.668 m, Y: 1.200.856 m)

KK2: the proposed site of the gate of Thu Duc water plant 110kV SS (X: 612.692 m, Y: 1.200.778 m)

KK3: Road No. 2, Le Van Chi, Linih Trung ward, Thu Duc district, HCMC (X: 612.755 m, Y: 1.200.719 m)

3. Topography, Geology and Soils

46. Ho Chi Minh City belongs to a transitional region between the southeastern and Mekong Delta regions. The general topography is that the terrain gets lower from North to South and from East to West. There are three types of terrain as summarized below:

a. The high terrain lies in the North-Northeast area and part of the Northwest area encompassing North Cu Chi, Northeast Thu Duc and District 9. This is the bending terrain with average height of 10-25 meters. Long Binh Hill in District 9 is the highest at 32 meters.

b. The depression terrain lies in the South-Southwest and Southeast part encompassing districts 9, 8, 7, Binh Chanh, Nha Be and Can Gio. The area's height is in the range of 0.5 to 2 meters.

c. The medium terrain lies in the middle of the city, encompassing most old residential areas, part of districts 2 and Thu Duc, and the whole of districts 12 and Hoc Mon. The area's height is 5-10 meters.

47. In general, the topography of Ho Chi Minh City is fairly diverse and therefore has good conditions for multi-faceted development. According to survey report of subproject "110kV Thu Duc water plant substation and connection line" in feasibility study, the geology and geography condition in the subproject area as summarized below.

48. The subproject area's topography is accumulative relief type. The surface is relatively smooth with separation of canals and traffic roads. The topography types' formed rocks include clay, clay loam, sand, clay sand, alluvium - Quaternary (a - Q).

49. The results of geologic exploration drilling under 35m in depth at the site, in combination with relevant geological data, show that the subproject area's geological structure includes river sediment (aQ II-IIIltđ) Thu Duc formation. The main components are clay, clay loam, clay loam mixed grit, sand.... distributed on the whole site proposed

constructing the Substation and Transmission line. The geological structures include following layers:

- Layer 1: Backfilled soil layer is mostly distributed in whole drilled holes at the Substation and Transmission line areas. The thickness is 1-2.5m
- Layer 2: Medium grained sand with grey, grayish white, soil less wet at porous state, which is distributed in the drilled holes of KM2, KT1, and KT2. The thickness is 0.7-3.0m
- Layer 3: Pebble clay loam with grayish white, grayish yellow, soil less wet at medium hard to hard state, which is distributed in the whole drilled holes. The thickness is 2.5-7m.
- Layer 4: Clay mixed kaolin with grayish white, grayish yellow, soft to medium hard state, which is distributed in the drilled hole of KM2. The thickness is 5.2m.
- Layer 5: It is clay with reddish brown, yellowish brown, blueish grey, medium wet soil, half to hard state, which is distributed in the whole drilled holes. Down to the depth of 35m, it has not seen this layer.
- Layer 5a: It is intercalated layer, clay loam with yellowish grey, brownish grey, soft state, which is distributed in the drilled hole of KM1, at the depth of 18.4-22.7m. The thickness is 4.3m.

4. Surface water/groundwater resources

50. Ho Chi Minh City has a diverse river system. Dong Nai River has mean flow about 20–500 m^3/s, supplying 15 billion m^3 water. This river supplies main source of fresh water for the city. In addition, Sai Gon River has 80 km in length flowing through the city; mean flow is 54 m^3/s. The river's width of the section through HCMC is 225 - 370 m with a depth of 20 m. Dong Nai and Sai Gon rivers are connected inside the city by Rach Chiec canal system. Another river in HCMC is Nha Be River, which is the confluence of Dong Nai and Sai Gon River, flowing to the East Sea through two estuaries such as Soai Rap and Ganh Rai. In addition to the main rivers, HCMC has still a tangled canal system, such as Lang The, Bau Nong, Tra, Ben Cat, An Ha, Tham Luong, Cau Bong, Nhieu Loc-Thi Nghe, etc.

51. Because of Pleistocene sediment, the north of HCMC (including the subproject area) has the plentiful source of underground water. However, at the City South part, due to Holocene sediment, underground water usually has alum or salt. The old inner city has significant reserves of underground water, although the quality is not quite good, this water is still used at three layers like 0–20 m, 60–90 m and 170–200 m (Miocene sediment).

52. In the Thu Duc District, underground water has better quality and considerable reserve. The survey in the subproject area showed that underground water at the bore holes appears to be stable in 0.2– $0.7m^2$ in depth.

5. Water quality

53. Surface water in HCMC is monitored under three categories that are water for supply purpose, water for other purposes and water in canal system. There are 22 stations monitoring water surface of rivers and canals around of HCMC.

54. Overall, the quality of supply water is clean in term of biochemical and chemical oxygen demand as well as coliform contents while the quality of water in canals inner the city is seriously contaminated. The results from survey show that almost all parameters of the supply water stations meet the standard (pH, BOD5, COD, salinity, Mn) with the exception of DO, coliform and oil contents which exceed the standard level. The water for other purposes has DO and coliform exceeding the standard level. Between 2012 and the first half of 2013, the parameters such as pH, BOD5, COD increased in the two categories of water-body (supply purpose and others).

55. Groundwater in HCMC is polluted by microorganisms, especially at Pleistocene and upper Pliocene layers. Hoc Mon is one of locations where two layers are contaminated by microorganism and this content increased in 2012 compared to 2011. Water quality of under the Pliocene layer at Hoc Mon district and District 12 is relatively good.

56. The subproject area has Cai stream, which is located far from the site proposed constructing the Substation of 800m toward the Northeast. The surface water quality of this stream is monitored at 2 sampling positions. The results show that all most the parameters are met the permitted level via QCVN 08:2008/BTNMT, except for the organic content which exceed the standard (Table 10).

Table10: The analyzed results of surface water quality in the subproject area

No.	Parameter	Approach	Unit	Result		QCVN 08:2008 / BTNMT
				N1	N2	
1	Temperature	Machine	^{o}C	28,4	27,3	-
2	Color	SMEWW 2120 B: 2005	Pt-Co	40	30	-
3	pH	TCVN 6492:1999 (*)		7,25	7,42	5,5-9
4	DO	SMEWW 4500O-C: 2005 (*)	mg / l	5,20	5,65	≥ 4
5	TSS	TCVN 6625:2000 (*)	mg / l	24,0	16,0	50
6	COD	SMEWW 5220 COD-C (*)	mg / l	13	14	30
7	BOD_5 (20 ^{o} C)	TCVN 6001-1: 2008 (*)	mg / l	7	8	15
8	$N\text{-}NH_4^+$	SMEWW 4500 NH_3 F (*)	mg / l	0,030	0,036	0,5
9	$N\text{-}NO_3^-$	SMEWW 4500-NO_3 -E	mg / l	0,060	0,078	10
10	$N\text{-}NO_2^-$	SMEWW 4500-NO_2 -B (*)	mg / l	0,012	0,014	0,04
11	PO_4^{3-}	SMEWW 4500P-E-2005 (*)	mg / l	0,078	0,070	0,3
12	Cl^-	TCVN 6194 -1996	mg / l	20,52	21,89	600
13	T-Fe	TCVN 6177 -1996	mg / l	1,237	1,312	1,5
14	Cha ¬ (Pb)	SMEWW 3111-B	mg / l	$1{,}30 \times 10^{-3}$	$1{,}22 \times 10^{-3}$	0,05
15	*T-Ecoli*	SMEWW 9221 E - 9222E	(MPN/100ml)	110	120	100
16	T- *Coliform*	SWEWW 9221:2005	(MPN/100ml)	9.000	6.400	7.500

(Source: The south environment and meteo-hydrology sub-institute, November/2014)

B. Biological Environment

1. Vegetation and Land Use: The vegetation coverage of Thu Duc District is mainly green trees parks, urban trees along traffic roads. In the area proposed to construct the Thu Duc Water Plant 110kV Substation and Transmission line, presently land is un-cultivated with weeds, without plantation trees in this scope.

2. Wildlife: The area has been residential area for long-term period and therefore no original habitats remain in the area. No significant wildlife occurs any longer within the area. There are no animals that could interfere with the underground cable.

3. Conservation Areas

57. There are no conservation areas within the proximity of the transmission line. The route does not cross or intrude into any conservation area, buffer area or any possible planned future extension of these areas.

C. Socio-economic conditions

1. Population

58. The transmission line and substation is situated within Ho Chi Minh City and includes 1 district with 1 commune and 1 ward. The population within the immediate subproject communes is 63,779 persons with 100% of the population being urban-based. Population statistics for the subproject communes is shown in Table 11. There are no ethnic groups in the area.

Table 11: Population distribution within the subproject area

Location			Rural Communes	Urban Wards	Population (no)	Female (%) Province	Male (%) District/
Province	District/	Commune/Ward					
HCMC	Thu Duc	Linh Trung	0	63.779	63.779	53	47
Total							
%			**0%**	**100%**	**100%**		

(Source: Statistical Data of Thu Duc District, 2013)

59. The population of Linh Trung ward in 2013 is 63,779 persons, from which, up to 67% population is immigrated from other places. The population within labour age is 53,432 persons (occupying 83% of the total population), female labour occupying 55%.

2. Local Economy

60. Ho Chi Minh City leads the country on economic growth. According to the statistics of HCMC Bureau of Statistic, the GDP growth rate in 2010 was 11.8%, which in 2012 decreased to 9.2% (nearly double that of Vietnam 's GDP). Ho Chi Minh City now accounts for one third of the country's GDP and is the main economic area and growth centre in the south of Vietnam where it contributes 66.1% of GDP in the southern key economic area and 30% of the total GDP of the southern region.

61. Thu Duc district, which is located on the Northeast HCMC, on the North – South traffic axis, is one of among key economic areas. This district has location and relative important traffic gate connected with the Eastern - Western – Southern Provinces, with many important traffic routes going through the District area such as the National Road 1A connected Western, Eastern and Southern regions going into the Center of HCMC. Besides, in the District area, there are some industrial, urban projects, which have been constructed, contributing to rapidly increasing the social-economic development of the District.

62. Thu Duc is a developed district in industry, commerce and services with the concentrating of many industrial parks, industrial zones and other production models. The agriculture activity only occupies a small scale (0.29%). Linh Trung is a ward concentrating many industrial parks and industrial zones of the locality, with the large industrial pars such as Linh Trung industrial zones 1, 2 and 3. The agriculture of Linh Trung ward is only livestock in some households, without cultivation sector.

a. Agriculture:

63. The agriculture of Linh Trung ward is only developing in pigs feeding with the total of 1,346 pigs, milk cows of 96 cows. There are not cultivation activities in the cultivation sector.

b. Industry

64. There are 3 large industrial parks within the Ward, that are Linh Trung 1, 2, 3, with the total 137 industrial production facilities, industrial production value in 2013 of Linh Trung ward is 935,740 million VND, accounting 15% of the total industrial production value of the District.

c. Commerce and services

65. Linh Trung ward has 3,045 commercial and service facilities, with the total income in 2013 of 2,144,439 million VND, accounting 11% of the total commercial and service income of the District.

C. Social Infrastructure

a. Public Health and Sanitation

66. At each subproject ward, it has medical station. The medical station can supply first aid and medical assistance for minor illnesses and maternal services. Medical emergencies are referred to Thu Duc district hospitals while more complex surgery is carried out in the main hospitals in Ho Chi Minh City.

67. The incidence of HIV/AIDS in Ho Chi Minh is the highest in Vietnam. According to the "Analysis and Advocacy" subproject of USAID the total number of people living with HIV in Ho Chi Minh City is expected to rise from 72,400 in 2006 to 89,900 in 2010 and 105,800 in 2020. In 2006, there were about 4,800 new AIDS cases in Ho Chi Minh City, in 2012 this figure was 1099 new cases which held 18.5% of total new cases in the whole country (According to report No. 755/BC-BYT of Health Ministry dated September 4th 2012). The number of people with HIV is 49,429 people as per statistics in the first quarter of 2012.

b. Education

68. Presently, Linh Trung ward has completed the universalization of primary school program with universalization scale 100%. The high school universalization has a lower scale, with junior school of 93%, and high school of 70%. In the whole Thu Duc district, it has 186 schools, in which, kindergarten occupied 77% (144 kindergartens), the rest is primary schools and high schools (total 42 schools).

c. Communications

69. The subproject area is being covered by many telephone networks such as Viettel and VNPT telecoms, and some other telecom companies. Therefore, it is highly convenient for people to communicate and develop this sector.

d. Water and electricity:

70. Water: Up to 2013, Linh Trung ward has 75% HHs used cleaning water supplied from the City water supply system, 20% HHs used drilled well, the rest used cleaning water from water stations.

71. Toilets/Bathroom: Mostly, all the HHs in the ward has toilets and bathroom with septic tank.

72. Electricity**:** Mostly, population in the ward have used electricity supplied from the local power companies and this electricity has been used in washing and some times for drying clothes, lighting, refrigerating, cooling, and television.

73. Cooking**.** Mostly, the residents in the Ward have used gas and coal for their cooking, mainly using gas.

e. Infrastructure for transportation

74. Infrastructure development for transportation is being constantly improved which has increased the standard of living and access to services. The road network is reasonably well developed throughout the subproject area. Located at the Northeast gate of HCMC, Thu Duc district has the traffic road system with National Road 1A, belt highway (Ha Noi highway), which have infrastructure suitable for social-economic development. Besides, Thu Duc district also has Sai Gon River surrounding the border from the West to the South, however, the marine traffic activities are not strongly developed in this river

section. In future, there will be Ben Thanh – Suoi Tien railway, along the belt highway axis.

4. Cultural and Heritage Sites

75. HCMC is one of largest and oldest city in Vietnam, and has many cultural and heritage sites. The most prominent cultural and heritage sites in the city center are the Reunification Palace (Dinh Thống Nhất), and Notre-Dame Cathedral (Nhà thờ Đức Bà). The city has various museums including the Ho Chi Minh City Museum, Museum of Vietnamese History, the Revolutionary Museum, the Museum of Southeastern Armed Forces, the War Remnants Museum, the Museum of Southern Women, the Museum of Fine Art, the Nha Rong Memorial House.

76. PECC4 has surveyed within the scope 500m from the proposed site for constructing the Thu Duc Water Plant 110kV Substation, and the results show that there are not any cultural and heritage sites in the surveyed area.

5. Subproject affected people

77. There will be only 01 organization affected by the subproject construction, which is Thu Duc water B.O.O JSC. The land acquired for the subproject construction will be compensated according to the Resettlement Plan (RP). Loss of land includes both permanent and temporary loss of land as defined below.

a. Permanent loss

78. The permanently acquired land will be 4,077 m^2, including (i) 3,816 m^2 for constructing the substation, which includes area for the connection pole due to the connection pole located within the substation area, and (ii) 261 m^2 access road.

b. Temporary loss

79. The subproject will not have temporarily acquired land, since the land for the underground cable ROW belongs to the scope of Thu Duc Water Plant 110kV Substation construction.

D. Additional Features of Substation and Transmission Line Sites

80. Subproject location is proposed to locate next to the highway (named Ha Noi highway) with overhead Metro railway (under construction) with the distance of 90m on the south. Also, there is an asphalt road namely Linh Trung street with the distance of 100m on the west of the substation site.

81. The nearest residential areas are located 200 m on the north and the west of the substation, they are residential area of Linh Trung ward. Figure 3 shows the status of proposed subproject site, with mainly of weeds and bushes, small trees.

	Figure 3a: Status of land area proposed constructing the Thu Duc Water Plant 110kV Substation
	Figure 3b: Status of land area proposed constructing the connection pole and UGC transmission line

Figure 3 : The photos of current location of the subproject

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

82. The assessment of potential impacts of the subproject is structured by the three development phases of the subproject defined by: *pre-construction*, *construction*, and *operational phase.* The two major components of the subproject (Substation, underground cable) addressed within this assessment.

A. Subproject Benefits

83. The single comprehensive benefit of the subproject is the provision of needed electrical power to Eastern Ho Chi Minh City to support the rapid urban, commercial, and industrial development that is occurring. The additional electrical power will significantly reduce power outages or brownouts that occur in the area, and the need to shunt electrical power from other parts of the city.

B. Potential Impacts and Mitigation Measures during Pre-construction Phase

1. Land acquisition and compensation:

84. Impact: In the basic design stage, it is defined permanently and temporarily acquired land areas for constructing the subproject. Total area of permanently acquired land for constructing the subproject is 4,077m^2, including 3,816m^2 for substation, 261m^2 for access road. The underground cable and connection tower are located within the area of substation, so there is no more land will be acquired for these items.

During the construction, the project will cause temporary impacts to 92m^2 of land for material storage. Construction will use of the existing vacant land within Thu Duc water plant for these storage area. The entire area of temporarily affected land will be borrowed from the land owners and the price for the land will be negotiated with the land owners in the presence of the third independent party as a witness. Should negotiation fail, a resettlement plan will be prepared based on the approved resettlement policy framework. No civil work shall commence until negotiations/compensation has been concluded. After construction is complete, the entire area must be restored and returned to the land users.

-There are no HHs must displace their houses/structures due to the subproject‘s land acquisition. Also, the subproject area has no trees affected by the construction.

85. Mitigation measures

- Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Ho Chi Minh City People’s Committee.
- Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations.
- Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations. Estimated cost of compensation and assistance for AHs is proposed approximate 8,969,400,000 VND ($399,527.84 USD). Budget for compensation payment will be enough and available.
- Construct completely each work item to minimize the duration of temporary land use for the project construction.
- Coordinate to address people’s claims/grievances relating to compensation.
- Restore and return the temporary acquired land for owners immediately after finishing the construction.

2. High Risk of Negative Impacts due to Inadequate Construction Site Arrangement

86. Impacts: There are some impact sources such as the planning of transportation and storage facilities. (i) The subproject is proposed to not arrange a disposal site because all excavated soil will be used to fill back and leveling, the required sand and soil

for leveling substation base will not be taken from borrowed pit but bought from sand/soil seller/provider. Other waste will be collected by the specialized units of HCMC (ii) The subproject, particularly substation, will have some huge equipment like transformer. Thus, its transportation can cause some damage for roads surface and traffic activities, (iii) material transportation will affect air environment due to dust. Stockpile and material gathering site can cause temporary acquiring land and affect people living near the site because of the movement of vehicle in and out the stockpile, and dusty around the gathering site

87. Mitigation measures***:***

- The contractors have to hire/contract a specialized unit (e.g. HCMC urban environment company) to collect waste generated from the subproject's construction,
- Developing the transportation plan for filling materials and overweight equipment and material will help to reduce the negative impacts,
- Contractor will arrange the temporary yards for stockpile and material gathering site within the substation area in order to avoid arising impacts due to land acquisition,
- Develop an site EMP to detail implementing all mitigation measures on the site.

3. Safety risk due to UXO

88. After decades of war UXO remains a significant issue in Vietnam. The proposed site was detected UXO by B.O.O Thu Duc Water Joint Stock Company (referred to Correspondence No. 25/2014/CV-TDWW dated June 17, 2014). Therefore, for this subproject, the UXO detection item will not be implemented (see Appendix F).

C. Potential Impacts and Mitigation Measures during Construction Phase

1. Potential impacts and mitigation measures for construction activities

89. Potential environmental impacts and mitigation measures of the subproject activities during the construction phase on the different environmental aspects are described as bellows:

a) Ambient air quality and noise

90. Impacts: Noise, dust and exhausts generated by machines', equipment's and transportation means' activities; substation leveling, soil excavation of foundation pits or underground ditch will impact on ambient air environment. These impacts are short-term and will be stopped when the construction is completed. Specifically:

- *Dust generated by soil excavation:* volume of excavated and filled soil for substation is 9,964m^3, and the figure for underground cable is 1,729 m^3. From these data, the concentration of diffused dust can be calculated, and the result shows that the data meet the standard (QCVN 05:2013/BTNMT < 300µg/m^3) at the distance of 100m from the emission source, with the data of 0.172 mg/m^3. Therefore, dust from soil excavation and fill for civil works will not severely affect to air environmental quality. The calculation result of concentration of dust showed that outside of the scope of 100m far from the impact source, the residential areas near the site will not be affected (the nearest residential area is 200m on the north far from the subproject site). The impact will last 2 months during excavation and leveling for substation, access road, and underground cable.

- *Dust and exhausts such as NOx, SO_2, CO generated by construction machines' and equipment's, and transportation means' activities*: there will be approximate 20 vehicles which will run on roads to transport workers, fuel, towers and other materials for

civil works. They will emit dust and exhausts with the concentration of 28.4 mg/Nm^3 (dust), 40.0 mg/Nm^3 (SO_2), 384.8 mg/Nm^3 (NO_x), 87.6 mg/Nm^3 (CO), and 31.6 mg/Nm^3 (VOC) lower than the allowable limits under QCVN 19:2009/BTNMT (column B), so impacts from this activity will be negligible. Furthermore, the impact will be last 06 months during construction phase

- *Noise generated by construction and transportation activities:* Noise will be generated by activities of machines, equipment and means such as truck, crane, bulldozer, excavator,… The noise spread calculation is based on the formula of U.S department of transportation, 1972, and the results shows that noise level from civil works will equal 70dB (permitted level for noise at residential area under regulation No. 26:2010/BTNMT) at the distance from 50m and above. Therefore, noise from civil work will not impact on the around residential area.

91. Mitigation measures:

- Construction units will frequently spray water at the construction sites and along the transport roads to minimize dust.
- Contractors will ensure that transportation means, machines and equipment must have effective certificate of environmental standards achievement (QCVN 04: 2009/BGTVT and QCVN 05: 2009/BGTVT) issued by the register department before using for the subproject construction.
- Construction materials (e.g., sand, gravel, and stone) that are transported by trucks will be covered by canvas.
- Temporary stockpiles/storage yards will be covered, or sprayed regularly to prevent dust and erosion.
- Reduce excavation and filling duration, and excavated soil will be used to fill right after complete work.
- Replace equipment, machines and vehicles causing large noise.

b) Water environment:

92. Impacts: Sources causing impacts on water environment include domestic wastewater construction wastewater and refused oil, lubricant and grease;

- *Domestic wastewater*: is generated by worker's life activities. Number of workers is about 30 people, thus domestic sewage volume generated is small, about 3.6m^3. Components of domestic sewage include residues, SS, organic matters (BOD/COD), nutrient matters (N, P) and micro-organisms. Workers live in the camp area. therefore domestic sewage generated will be collected in movable toilets. For this reason, impacts of domestic sewage will be mitigated, emission source can be managed and controlled.

- *Construction wastewater*: includes mainly water pumped from the underground cable ditches and tower foundation pits, abundant water from concrete maintenance of tower foundation pits, abundant water from concrete mixing. Components of tower foundation pit pumped sewage are mainly SS, mineral salt and organic matters washed from the ground surface, thus it can cause increase in the turbidity of surface water sources near to the subproject site. Wastewater from concrete maintenance of tower foundation pits, concrete mixing only include SS without hazardous substances impacting on environment. Furthermore, the construction works will take place in dry season, so the volume of construction wastewater will be small

Refused oil, lubricant and grease; clouts with oil, grease, lubricant; waste sewage from washing machines, equipment and means with oil, gearse and SS will cause surface water source pollution if not collected and treated. According to research result of

"Research of refused lubricant, oil recycle into liquid fuel" conducted by military science and technology center – Ministry of National Defense in 2002, the average volume of oil, lubricant refused from construction machines and vehicles is 7 liters for every changing time. Period for changing lubricant and maintenance is 3÷6 months depending on machines' and vehicles' intensity of activity. With about 10 types of machines and vehicles, construction duration of 6 months, volume of refused oil and lubricant is about 23.33 litres.

The nearest water body to the subproject site is Cai stream, which is 800 m far from the site toward the Northeast. Therefore, the wastewater will affect underground water via percolation into the soil if the wastewater is not collected by the drainage system and treated in the wastewater treatment system of the City.

93. Mitigation measures: Water environmental impact mitigation measures include:

* For domestic wastewater: hire mobile toilet (type used for civil works) with collected and treated tank with three sections such as containing, depositing and filtering. Dimension of the collected and treated tank can be 4.2 m^3 in totally, with containing section – 2.1 m^3, deposited section – 1.4 m^3, and filtering section – 0.7 m^3. The mobile toilet has to put beside the worker's camp to workers use conveniently.

* For construction wastewater:

- Arrange construction sewage collection holes for depositing SS before wastewater flows into the drainage system of the City. The common dimensions can be 0.5mx0.5mx0.4m (height x wide x deep).
- All the reparation and, maintenance of machines, equipment and transportation means will be implemented at garages not in the construction sites. Refused oil and grease, waste sewage from washing machines, equipment and means, clouts with oil, grease will be collected and treated at these garages as stipulated.

c) Soil environment and urban environmental sanitary

94. Impacts: Sources causing impacts on soil environment and urban environmental sanitary include: impacts due to domestic and construction solid wastes, and impacts due to earthwork causing soil erosion.

- *Impacts due to domestic solid wastes* created by workers' daily-life activities. The number of workers is about 30 people. Thus, domestic solid waste volume is small, about 9-12kg/day and it can be controlled. The composition of domestic solid wastes includes: organic matters, plastic, paper, glass and other inorganic matter, of which organic matters are accounted for the main part. The domestic solid waste can contain pathogenic bacteria/viruses that are harmful for human health and domestic animals, this cause unhygienic environment for the residential area. However, the volume is small and the impact is temporary, so this impact is insignificant.

- *Impacts due to construction solid wastes* created by construction activities. These wastes include fallen materials; empty cement sacks, wooden barrel used for packaging equipment and devices, clouts etc. If this kind of waste is not collected, it cause disturbance and unsanitary for the surrounding residential areas.

- *Oil* may be leaked from machines and equipment during operation and maintenance activities or from changing fuel and lubricants. These can cause soil pollution.

- *Earthwork includes excavation, filling back, leveling* for substation and access road, excavation for underground cable and the connecting tower foundation. These activities will cause soil become loose and easily erode or slide if it's rain. Therefore,

contractors need to have mitigation measure for this impact.

The spilled oil and earthwork can affect soil environment in the subproject site. However, the soil in this area is not used for agriculture, and it is expected to be concreted in the future for the commercial land use purpose. Therefore, this impact is negligible.

95. Mitigation measures:

- Contractor will set up dustbins for collecting rubbish at the worker camp sites. Then hiring HCMC Urban Environment Company Limited to collect, transport for treatment as regulations.
- Earthworks will be conducted during dry period;
- Utilize salvage excavated soil for filling ground foundation.
- Collect, salvage materials such as steel pieces, cement sacks, wooden barrels, etc. to reuse or sell. For other construction materials which can not be reused, it will be collected and transported to the disposal site.
- Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.
- Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.

d) Other underground works:

96. Impacts: the subproject has 50m long of the underground cable section, and it is expected to locate within the substation area. The excavation and construction underground cable may affect underground works. However, according to the letter No. 25/2014/CV-TDW dated 17 June 2014 of Thu Duc B.O.O water Company, there is no underground facilities likely existing in the subproject area.

e) Traffic activities and quality of road:

97. Impacts: Impacts on traffic activities: the substation, access road, and underground cable will not cross over any roads or streets, therefore, the construction will not obstacle the traffic activity in the roads near to the subproject area. However, the material transportation will increase in the quantity of means on roads that can lead to increase in traffic jam and risk of traffic accidents. Overloaded vehicles transport on the road can cause road damage.

98. Mitigation measures

- Contractors need to arrange and regulate their vehicle density to minimize impact on traffic activities.
- Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities.
- Speed limits should be posted and adhered to by transportation means serving the subproject construction.
- Limit transportation of materials in rush-hours to avoid traffic jam.
- Transport materials with the allowable load. Not expand trucks' body.
- Conduct road upgrading or repairing if collapse occurs due to the subproject construction.

- Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.

f) Other TLs and communication lines

99. Impacts: the underground cable will connect to the existing 110kV Thu Duc – Binh An TL via a new-constructed tower, thus this existing TL will also be cut power for safety during connect from the new tower to the existing TL. This will affect to citizens living due to power cut.

100. Mitigation measures:

– Complete the construction of new tower and underground cable before cuting power on the existing TL in order to minimize the time of power cut.

- Cooperate with the management unit of the existing TL to inform people for their life and production arrangement before cut-off power.

- Concentrate the worker and equipment forces to connect as fast as possible in order to minimize the time of power cut on the extisting transmission line.

g) Occupational health and safety of workers

101. Impacts: Construction activities may cause health harm and danger of the workers' lives, specifically: i) Workers will live in worker camp located in site the Thu Duc water Plant. Workers could get some disease if worker camp is under unhygienic condition; ii) Accidents can be happened during operation of machines, vehicles or working at height; iii) Traffic accident during transportation of facilities, materials for construction of the subproject; and iv) Electric shocks during connecting and test electric with the existing substations. These impacts last during the construction phase and will stop when the subproject construction phase finishes.

102. Mitigation measures:

- Health and safety plan (HSP) will be prepared and implemented by the contractor.
- At worker camp site, a hygienic toilet, wastewater drainage, solid waste disposal site will be in place. Temporary kitchen, bath room will be kept clean. Clean water will be used for drinking and cooking purposes
- All workers will be examined health, especially people working at height, and equipped sufficiently labor protection tools such as hard hats, safety gloves, safety belt, ear protection etc. This must be strictly imposed.
- All construction equipment, tools will be carefully examined for quality and quantity before used. For people working at height, the suspending cables will be carefully checked before climbing on the tower; no work at height will be permitted when it is going dark; it has fogs; it has strong wind with above class V. Workers who climbs on towers must have Safety Certificate of Class 3 or above, and sufficient conditions for working at height. Safety belts will be attained use standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers will wear safety belts and the safety leather belts must be tightly tied with the tower.
- Carefully check boom guy, cable clip before load heavy objects.
- For excavation and leveling works: apply measures to consolidate the slope of tower foundation pits in dangerous positions during construction in order to avoid soil erosion;

- Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation.
- Strictly comply with safety norms for installation of electrical equipment and relative regulations.
- Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment.
- Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes.
- Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people not on the duty must go out of the danger area.
- Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during the connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location.
- All towers, steel structures and equipment must have earthing system.
- Contractors will prepare emergency measures on time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid.
- As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp.
- PMB will be responsible for including these requirements in the contract documents.

h) Community health and safety:

103. Impacts:

Subproject construction would cause impacts to community health and safety as followings: i) Accidents, dust and noise due to increased traffic activities from the transport of materials; ii); These impacts are insignificant and short-term, they occur only in the construction phase (about 06 months) and will stop when the project construction finishes.

104. Mitigation measures: To mitigate these potential impacts, the civil contractor will develop a community health and safety plan (CHSP) that incorporates good international best practice and recognized standards. The CHSP should include emergency response and preparedness procedures to be developed in close consultation with potentially affected communities and local authorities. The plan should include specific emergency response procedures, communication systems and protocols, interaction with local and regional emergency and health authorities, provision of emergency equipment and facilities such as fire truck, emergency service vehicles,….

- Set up warning boards on all high voltage towers to warn people not to be in contact with them.
- Installation of lightning protection systems in all towers as stipulated. Paint color (as defined) on tower with the height of 50m and above.
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting.

Implementation of these measures will be the responsibility of the contractor. PMB will be

responsible for including these requirements in the contract documents.

i) Social aspects:

105. Impacts: Concentration of workers (30 people) in the subproject site can cause disorder and insecurity, disturbance in the locality due to conflicts between workers and local people, social evils; increase infectious diseases generation etc. These impacts are insignificant, short-term, only occur in the construction phase (about 06 months) and will stop when the project construction finishes.

106. Mitigation measures:

- Local labors will be hired as much as possible to prevent or minimize influx of migrant workers, and incidence of social diseases and community chaos.
- Examine periodically workers' health.
- Manage and educate workers to enhance their awareness of environmental sanitation and health protection.
- In order to minimize the risk of injury to the local residents and the workers, it needs to comply with the GOV's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed.
- Establish the specific food safety regulations for construction workers.
- Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to CPCs within the project area during the construction phase. They should also establish the relationship with the local authorities to discuss and take decisions necessary for their management.
- Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws.
- Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education should be given to workers.
- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.
- Make a good relationship and proper coordination with the local authorities to manage their workers.

2. Protected areas, rare and precious species, and cultural resources

107. Thu Duc water plant 110kV substation and connection line is not located in any protected area without rare, precious and endangered animal/plant species. Chances of detection of valuable relics and cultural values will be anticipated by contractors, especially during excavation process. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. Work at the found site will be stopped until DoCST allows to be continued working.

3. Repair, restore, and return the ground after construction completion

108. Repair, restore, and return the ground after construction completion need to implement to mitigate impacts on environment after construction. The activities and measures are:

- Repair, recover, and return the road sections, and public infrastructures damaged by the subproject construction.
- Clear, level and restore the ground after construction completion. Grow trees in temporarily acquired areas.

D. Potential Impacts and Mitigation Measures during Operation Phase

109. The expected adverse impacts during the operational phase of the substation and underground cable are generally related to the occupational and community health and safety issues, and pollution issues due to worker's waste and hazardous waste. The impacts are reversible, manageable, and can be mitigated with proper engineering and management controls. HCMC high voltage Company will be responsible for the operation of the subproject and its ancillary services

1. Occupational Health and Safety

110. Impacts. The occupational health and safety issues inherent to the operation of high voltage substation include hazards due to exposure to live high voltage systems, working in heights and risks of accidents, potential exposure to electric and magnetic fields. Accidents that may occur include; electrocution, lightning strike, fire and explosion.

- Exposure to High Voltage Systems. Workers may come in contact with live power lines/equipment during the maintenance of the facilities and electrocution from direct contact with high-voltage electricity is a hazard directly related to transformer and facilities.

- Working in Heights. Accidents may happen when working in heights. However, a worker safety plan may be implemented to reduce risks that include testing of structural integrity prior to proceeding with the work and the use of fall protection measures.

- Worker Exposure to Electric and Magnetic Fields (EMF). Typically, electric utility workers have higher exposure to EMF than the general public because of working in close proximity to electric power equipment. The electric fields of the 110kV substation is calculated for several positions and compared to regulations (see Table 12).

Table 12. Calculated electric field intensity at positions within the 110kV substation and connection line

No.	The 110kV substation	Calculated maximum intensity (kV/m)	Permitted standard (kV/m) Under Decree 14/2014/NĐ-CP	
			Indoor	Outdoor
1	Substation's yard	4.31		5
2	Under the 110kV TL	0.57		5
3	Within control house	0.68	1	

Table 12 shows that electric field intensity of the substation is meet the standard as regulated in Decree No. 14/2014/ND-CP on electricity safety. Furthermore, this decree also stipulate that allowable limits of working time per day for workers who work in EMF is summarized in Table 13

Table 13: EMF intensity and allowable limits of working time during one day

EMF intensity (E) (kV/m)	< 5	5	8	10	12	15	18	20	20 <E<25	≥25
Allowable limits of working time during one day (minutes)	Not limited	480	255	180	130	80	48	30	10	0

Shortly, EMF in the substaion meets the stardard, and operators are arranged to work in

shifts, crews, which ensures working time as stipluated, and time for contacting with EMF. Thus EMF will not impact on operators' health.

For the transmission line: workers only expose EMF during maintenance process, and the time per day for maintenance is also about 8 hours per day. Risk of negative effects to health due to electromagnetic fields caused by the operation of the underground cable section is essentially zero, but also not affirms because negative effects to health due to electromagnetic fields have not been proved by the medical profession.

111. Mitigation measures. HCMC high voltage Company will follow the IFC (2007) and EVN guidelines when carrying out maintenance of the transmission line and substation facilities.

* Some of the prevention and control measures when working with electrical systems are:

- Restricting access to electrical equipment to only those workers who are trained and certified to work on electrical equipment.
- Adherence to electrical safety standards.
- Proper grounding and deactivation of live power distribution lines during maintenance work or if working in close proximity to the lines.
- Provision of PPE for workers, safety measures, personal safety devices, and other precautions
- Observe guidelines regarding minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around power lines and the substation.
- The entrance to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors should be kept locked unless such entrances are under the observation of a qualified person at all times.
- Switchboards, panel boards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized should be field marked to warn qualified persons of potential electric arc flash hazards.

* Follow safety measures when working on height, particularly:

- All workers must be examined health for working on height, equip sufficiently labour protection tools.
- Workers who climbed on poles must have Safety Certificate of Class 3 or upper and sufficient conditions for working on height. Safety belts should be attained used standard of the nearest inspection, not exceeding over 6 months. During movement and working on height, workers must wear safety belts and the safety leather belts must be tightly tied with the pole.
- All construction equipment, tools should be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the pole.
- Not permitted to work on height when it is going in night; it has fogs; it has strong wind with upper class V.

* The occupational EMF exposure should be minimized through the implementation of an EMF safety program that includes:

- Identification of potential exposure levels in the work area including surveys of exposure levels and establishment of safety zones
- Limit access to properly trained workers and those equipped with appropriate PPE when entering safety zones.

- Utilization of personal monitors during work activities.
- Posting of safety signs and warning signs.

2. Community Health and Safety

112. Impacts.

- Electrocution Hazards: the community can be exposed to electrocution hazards as a result of direct contact with high voltage electricity or from contact with tools, vehicles, or other devices that come in contact with high-voltage electricity.
- Exposure to Electromagnetic Field (EMF). The transmission frequency commonly used in transmission systems ranges from 50 Hz - 60Hz which is considered to be an extremely low frequency (IFC, 2007). Effects reduce with distance and electric fields also become shielded by trees, buildings, and other materials that conduct electricity. In
  general electric fields are strongest close to the source and diminish with distance.

The subproject will be designed and constructed in compliance with regulations on technique and high voltage network, EMF must be ensured ≤ 5kV/m at any point outside the houses at the height of 1m from the ground and ≤ 1kV/m at any point inside the houses at the height of 1m from the ground. The underground cable is within the substation area, safety of EMF are followed the safety applied in the substation.

Calculation result based on Japan's CRIMAG model, EMF intensity of unprotected 110kV charge carrier at distance of 7m in comparison with the carrier is 1kV/m. Thus, EMF intensity outside of the scope of 7 m-radius from the 110kV transformer and round the substation is ≤ 1 kV/m. Furthermore, Thu Duc 110kV substation and its underground cable is rounded by fence, EMF intensity is measured, checked periodically each 6 months by the operation management unit as stipulated. So people living outside of the substation fence will not be impacted by EMF due to the substation operation.

113. Mitigation measures:

* To prevent electrocution hazards, HCMC high voltage Company will implement the following:

- Conduct earthing for the substation and the connection tower. Provision of warning signs, anti-climbing boards, and anti-approach boards to the substation.
- Equipped with electromagnetic coats to staffs that have to work in areas with high electromagnetic fields. Also, when working in areas with high influence of the electric field operators must comply with industry standards for permissible level of intensity electric fields of industrial frequency regulation and inspection work place;
- Fully equipped labor protection instruments, compliance with regulations on working time in areas with high field strength to ensure safety;
- Perform work shifts to ensure the contact time with the electric field strength in the specified limits.

* To prevent impacts of EMF: The World Health Organization (WHO) reported that there is inconclusive evidence about substantive long-term health issues related to radiation emanating from low frequency electric fields at levels generally encountered by members of the public. The potential health effects associated with exposure to EMF is not well-established due to lack of empirical data demonstrating adverse health effects. However, the public should be warned about the safety distances from the transmission system and power lines through warning signs and the restrictions on erecting any houses or buildings within the RoW and earth zone are to be enforced by operation unit.

3. Worker's waste and hazardous waste

114. Impacts. Substation is designed to be an automatic mode with remote control, no

permanent staff. There is no domestic wastewater and rubbish during substation operation.

Hazardous waste includes transformer oil and clouts stuck oil due to cleaning equipment. Transformer oil will cause pollute soil and water environment if releasing outside, this can severely affect ecology and other relevant activities.

According to operation procedure, transformer oil will only be discharged and refilled by new oil after 10-15 years of operation. Every year, the oil will be tested and filtered and then reused. Therefore the volume of waste oil from transformer is negligible.

115. Mitigation measures:

- Transformer operation regulation does not allow releasing oil outside of the environment. This oil will be checked annually and filtered to continuous use. Oil will be only released outside when the transformer get at risk, but it will be collected into the tank built under the transformer.
- In case of transformer failure or oil change, the emergency oil and waste oil will be collected and stored in the emergency oil tank with the volume of 36 m^3. Then the operation unit (HCMC High Voltage Grid Company) will contract with competent unit having license for hazardous waste treatment. The competent unit will pump the oil into tankers then transport to factories for treat under regulation for hazardous waste.
- In the annual test for transformer oil, if the oil sample is analyzed to not meet technical specification for operation, the oil will be filtered under the regulated procedure and conducted by the specialized and licensed unit.

4. Climate Change

116. Regional Global Circulation Modeling project greenhouse-climate change induced changes to the frequency and severity of rainfall events in the subproject area. The design of the substation and transmission line includes sufficient infilling to a grade that will be resilient to flooding associated from a 50 year storm.

VII. GRIEVANCE REDRESS MECHANISM

117. A well-defined grievance redress and resolution mechanism will be established to address affected persons (AP) grievances and complaints regarding environmental issues. All APs will be made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process will be published through an effective public information campaign. The grievance redress mechanism and appeal procedures will also be explained in a subproject information booklet (PIB) that will be distributed to all PC of affected communes. The CPC will inform it to all Aps for their reference.

118. APs complaints can be made verbally or in written form. In the case of verbal complaints, the committee on grievance will be responsible to make a written record during the first meeting with the APs.

119. All meetings shall be recorded by the grievance committee and copies shall be provided to APs. A copy of the minutes of meetings and actions undertaken shall be provided to the PO/PPMB**,** and ADB upon request.

120. The procedures for grievance redress is defined below and summarized in Figure 4.The procedure described below should apply easily to environmental issues and be consistent with the legal process for resolution of disputes in Viet Nam.

i) Step 1: Complaints from APs for the first time shall be lodged verbally or in written form to contractor, PPMB because initial environment issues will be most likely be construction-related. Contractor and PPMB are responsible to resolve the issue within 15 days from the date when the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

ii) Step 2: If no understanding or amicable solution can be reached or if no response is received from the Contractor or PPMB within 15 days from filing the complaint, the APs can elevate the case to the Ward People's Committee (WPC). The WPC will respond within 15 days upon receipt of APs complaints. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

iii) Step 3: If the AP is not satisfied with the decision of the Grievance Committee within 15 days since the date of submitting complaints, or in the absence of any response, the APs can appeal to the District People's Committee (DPC) and/or district court. The DPC will respond within 15 days from the day the complaint is received.

iv) Step 4: If the AP is still not satisfied with the decision of the District Office or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the Provincial People Committee (PPC). PPC will review and issue a decision on the appeal within 15 days from the day the complaint is received.

v) Step 5: If the AP is still not satisfied with the decision of the PPC or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the court at city level. The court will address the appeal by written decision and submit copies to the respective entities which include the Project Owner, PPC, DPC, WPC and the APs. If, however, the AP is still not satisfied with the court's decision, the case may be elevated to the provincial court. If however, the decision of the provincial court is still unsatisfactory to the APs, the APs may bring the complaints to the Higher Court.

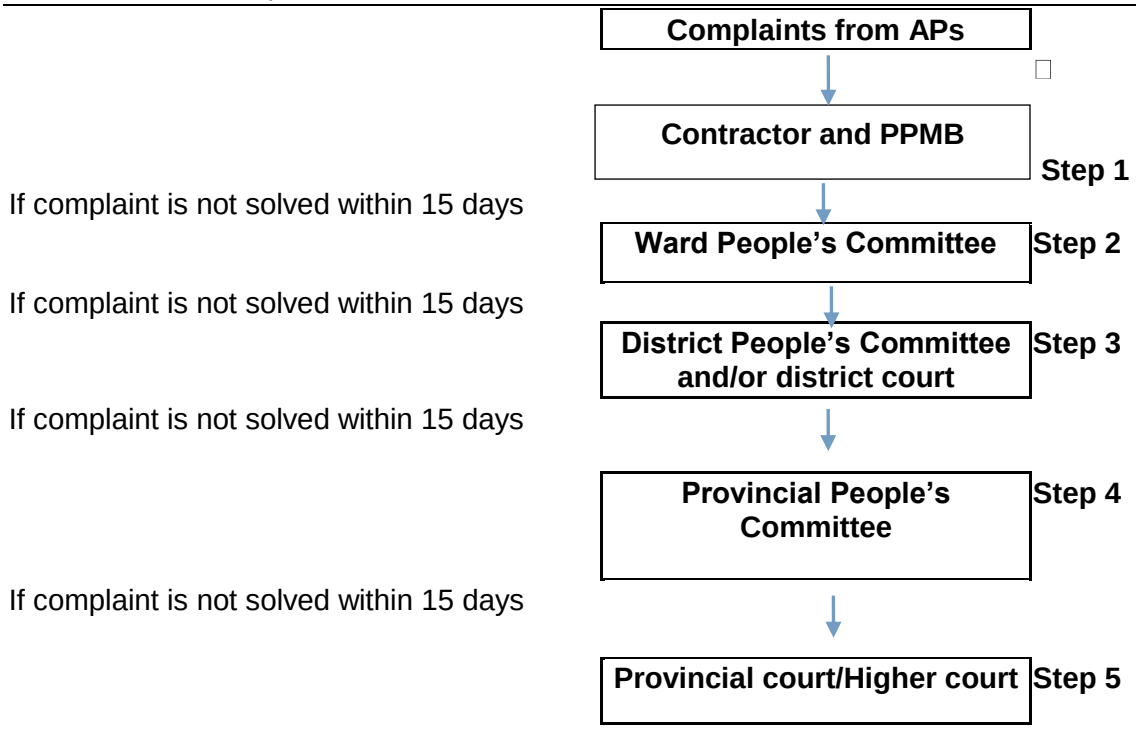

Figure 4. The public grievance redresses process

121. The EA and EVN will be responsible for checking the procedures and resolutions of grievances and complaints. The EVN/EA must have expertise and experience in social and environmental issues associated with infrastructure developments. The EVN/EA may recommend further measures to be taken to redress unresolved grievances. The environmental specialists will provide the necessary training to improve grievance procedures and strategy for the grievance committee members when required.

122. In cases where APs do not have the writing skills or are unable to express their grievances verbally, they are encouraged to seek assistance from the recognized local groups, NGOs, or other family members, village heads or community chiefs to have their grievances recorded in writing, and to have access to documentation, and any survey or valuation of assets, to ensure that where disputes do occur, all the details have been recorded accurately enabling all parties to be treated fairly. Throughout the grievance redress process, the responsible committee will ensure that the concerned APs are provided with copies of complaints and decisions or resolutions reached.

123. If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, APs have the right to directly discuss their concerns or problems with the ADB Southeast Asia Department through the ADB Viet Nam Resident Mission (VRM). If APs are still not satisfied with the responses of VRM, they can directly contact the ADB Office of the Special Project Facilitator (OSPF).

VIII. ENVIRONMENTAL MANAGEMENT PLAN

124. An EMP is developed for the implementation of the Thu Duc water plant 110 kV substation and connection line subproject. The purpose of the EMP is to integrate the results of the IEE into a formal management plan that is implemented in parallel with the subproject to prevent or minimize the potential environmental impacts and issues that were identified by the IEE. The EMP addresses the results of the public consultations on the subproject that were convened as part of the IEE.

125. The EMP, *inter alia*, consists of an Impacts Mitigation Plan, a Monitoring Plan, and an Emergency Response Plan. The EMP also prescribes the institutional responsibilities for the implementation of the EMP. The EMP is a management tool that provides a set of directives and guidelines that the subproject owner follows to prevent or minimize unnecessary environmental impacts of the subproject.

126. Environmental impact mitigation plan has been developed based on each subproject activities with respective impact and mitigation measure. Also, the plan identifies the reports, responsibility of subproject's stakeholders as well as estimated cost for implementing mitigation measures. Detailed contents are shown in Table 14.

Table14. Environmental Impact Mitigation Plan

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
Preparation phase, detailed design								
Land acquisition and compensation	Impacts on local people's life and economy	1. Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Ho Chi Minh City People's Committee. 2. Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations. 3. Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations 4. Construct completely each work item to minimize the duration of temporary land use for the project construction. 5. Coordinate to address people's claims/grievances relating to compensation. 6. The subproject's Resettlement Due Diligence Document has been clearly describe and resolved the impacts due to land acquisition and compensation	All affected persons in the subproject areas	Before implementing the subproject	See the RDDD	See the RDDD	IA/EO	Compensation and resettlement committee
Construction site arrangement	No impact. This activity help to prevent or avoid impacts by disposal	7. Constructor develops transportation plan for equipment and materials to reduce negative impacts. 8. Constructors must have the license for safety and	Subproject site	Before construction begins	01 time Before construction begins	No marginal cost	PO/PMB/PIC	PMB/contractors

[2] Costs will need to be updated during detailed design phase.

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
	and civil works	environmental requirements of mobilized machines and vehicles.						
Construction Phase of Subproject								
Initiate SEMP and sub-plans.	No impact. This activity help avoid, prevent or minimize impacts	9. Initiate updated SEMP including individual management sub-plans for different potential impact areas	All construction sites	Beginning of construction	Once	No marginal cost	IA/PIC	EO and contractors
Concentration of workers and domestic wastes generated	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	10. Contractors consider unskilled jobs for hiring local labors to conduct to prevent or minimize influx of migrant workers, and incidence of social diseases and community unrest. 11. Hire mobile WC with septic tank for camps and put dustbins at camps for collecting domestic sewage, rubbish and treating them adequately. 12. Worker camps must have adequate rainwater drainage system. 13. Examine periodically worker health. Equip medicine cabinet for protecting workers' health in time. 14. Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers. 15. Establish the specific food safety regulations for construction workers. 16. Construction units should implement temporary residence registration for all construction workers to CPCs within the project area. They should also	All worker camps	Throughout construction phase	Monthly	No marginal cost	IA/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		establish the relationship with the local authorities to discuss and take decisions necessary for their management 17. Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws. 18. Establish rules in camp. Propagandize, educate workers and create good relations with people in order to avoid conflicts arising. HIV/AIDS education should be given to workers. 19. Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities. Make a good relationship and proper coordination with the local authorities to manage their workers.						
Refused rock and soil, debris, other hazardous wastes generated by rock and soil filling and excavation for, cable trenches, , and equipment, devices, machines and transportation means	Cause soil and surface water pollution by refused rock and soil, debris, other hazardous wastes	20.Max. salvage excavated soil, rock for filling cable trench, leveling substation foundation, strengthen the connecting tower foundation according to excavation and filling balance method. 21.Collect, salvage matters such as steel pieces, cement sacks, wooden barrels,… to reuse or sell. For other refused construction materials which cannot be reused, hire local competent unit for collecting and treating. Hazardous waste impact mitigation 22. For refused grease, oil: implement equipment, machines and vehicles repair and maintenance at local	All construction sites	Throughout construction phase	Monthly	See Environmental Monitoring Plan (EMoP)	PIC / EO and DONRE	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		garage. Waste grease, oil will be collected to treat at this garage as stipulated. 23.Other wastes such as paint containing can; clouts with oil, grease; failed fluorescent lamp,…must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.						
Earthwork, leveling work at substation, connection tower and underground cable	Increase risk of soil erosion that will rise the turbidity of surface flow, the loss of soil nutrients	24.Earthworks should be conducted during dry periods. 25.Salvage excavated soil, rock for filling cable trench, leveling substation and access road, and strengthen tower foundations according to excavation and filling balance method. 26.Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/contractor
Construct drainage system of rainwater, water pumped from the underground trenches	Deposit mud sand; reduce suspended solids in surface rainwater and water pumped from underground trenches; prevent rainwater and water pumped from the foundation pits from overflowing on the ground	27. Provide drainage system of rainwater, water pumped from the underground trenches when constructing to prevent standing water and local flooding; deposit mud sand. 28.Install temporary storm drains or ditches for construction sites 29.Arrange construction sewage collection holes for depositing SS before running into the drainage system of the city.	All construction sites.	Design and construction phases	Monthly	No marginal cost	PIC/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
Construction activities and transport vehicles	Noise, dust and exhausts impact on ambient air environment quality	30.Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certificate of environmental standards achievement issued by the register department. 31.Frequently water the construction sites and construction material transportation roads. 32.Means transporting construction materials in and out of the project site must be covered by canvas. 33.Cover canvas or water materials storage yards/stockpiles such sand, cement, filling soil etc. 34.Reduce excavation and filling duration, and excavated soil should be used to fill right after complete work. 35.Implement appropriately equipment, machines and vehicles maintenance. 36.Replace equipment, machines and vehicles causing large noise.	All construction sites	Beginning of construction (for license of equipment, machines and means) and throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/Contractor
Construction materials transportation, and storage	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	*For road and traffic activities:* 37. Prepare implementation alternative for the underground cable at every inter-cross location. 38.Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities. 39.Arrange reasonable work to avoid traffic obstacle.	All construction sites.	Throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		40.At the locations crossing over the roads, it needs to set up scaffolding during wire scatter and pull process. 41.Set up signal light when constructing at night. 42.Put up warning boards at dangerous road sections. 43.Speed limits should be posted and adhered to by transportation means. 44.Limit transportation of materials in rush-hours. 45.Transport materials with the allowable load. Not expand trucks' body. 46.For oversize and/or overweight materials and equipment, it must have special purpose transport means. 47.Conduct road upgrading or repair if collapse occurrence due to the subproject construction. 48.Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
Cut power to connect the national power grid	Discontinue utilities and services such as power supply, traffic disruption etc.	49. Complete the construction of new tower and underground cable before cutting power on the existing TL in order to minimize the time of power cut. 50. Cooperate with the management unit of the existing TL to inform people for their life and production arrangement before cut-off power. 51. Concentrate the worker and equipment forces to connect as fast as possible in order to minimize the time of power cut on the existing transmission line	All construction sites.	Throughout construction phase	Monthly	No marginal cost	PIC/EO and Utility company	ES/contractor
Occupational health and safety of workers	Worker injury and health	52. Health and safety plan (HSP) will be prepared and implemented by the contractor. 53. All workers must be examined health, especially people working at height, and equipped sufficiently labor protection tools. This must be strictly imposed. 54. All construction equipment, tools should be carefully examined for quality and quantity before used. For people working at height, it should carefully check the suspending cables before climbing on the tower; not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. Workers who climbed on towers must have Safety Certificate of Class 3 or above, and sufficient conditions for working at height. Safety belts should be attained use standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers must wear safety belts and the safety leather belts must be tightly tied with the tower. Carefully check boom guy, cable clip before load	All construction sites.	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		heavy objects. 55.Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation. 56.Strictly comply with safety norms for installation of electrical equipment and relative regulations. 57.Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment. 58. Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes. 59.Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people without relative task must go out of the danger area. 60.Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location. 61. All towers, steel structures and equipment must have earthing system. 62. Contractors have to prepare emergency measures in time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid. 63. As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp. 64. PMB will be responsible for including these requirements in the contract documents.						
Community health and safety	Local people injury and health	65. Civil contractor will be required to develop a community health and safety plan. 66. Set up warning boards on substation site to warn people not to be in contact with them. 67. When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting. 68. Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW to communities living near areas where the TL crosses over. 69. PMB will be responsible for including these requirements in the contract documents.	All construction sites.	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/EO	ES/contractor
Detect cultural and historical	Avoid damage to cultural and historical	70. Chances of detection of valuable relics and cultural values should be anticipated by contractors.	All construction sites	At the begging, and throughout	Monthly	No marginal cost		

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
properties or values	properties or values	Site supervisors should be on the watch for finds. 71. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. 72. Work at the found site will be stopped until DoCST allows to be continued working.		construction phase			PIC/EO	ES/contractor
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	73. Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by subproject construction. 74. Clear, level and restore the ground after construction completion. 75. Grow trees in temporarily acquired areas.	All construction sites.	throughout construction phase until the project is put into operation.	Monthly	No marginal cost	PIC/EO	ES/contractor
Subproject Operation phase								
Occupational health and safety of the workers operating the substation and maintaining TL		76. Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers. (ii) Adherence to electrical safety standards. (iv) Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or if working in close proximity to the TL. 77. Follow safety measures when working at height	Substation, and ROW	Fulltime	Biannual	O and M	The high voltage grid management of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		during maintenance and repair the TL, particularly: (i) All workers must be examined health for working at height, equip sufficiently labor protection tools and cloths. (ii) Workers who climbed on towers must have Safety Certificate of Class 3 or above and sufficient conditions for working at height. Safety belts should be attained used standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers must wear safety belts and the safety leather belts must be tightly tied with the tower. (iii) All equipment, tools and means should be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the tower. (iv) Not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. 78. Occupational EMF exposure should be minimized through the implementation of an EMF safety program that includes: (i) Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones (ii) Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones. (iii) Utilization of personal monitors during work						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		activities. (iv) Post safety signs and warning signs. 79. In addition, in the operation phase, conduct training for workers in order that they can respond to risks/failures and meet the operation procedures. An emergency and safety guideline needs to be prepared and disseminated to the workers for handling risks/failures occurring in the operation process. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the T/L. Equipment maintenance areas must be located away from the residential areas.						
Community Health and Safety		80.To prevent electrocution risk, HCMC high voltage Company will implement the following: (i) To ensure absolute safety, operators must comply with operation procedures and safety requirements; (ii) Provision of warning signs and anti-climbing devices on the substation. (iii) Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the underground cable. ((vi) Observe/Test EMF at resident's buildings for treating appropriately if any complaint.	Around the subproject area	Fulltime	Biannual	O and M	The high voltage grid management of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
Hazardous waste from substation operation	Transformation oil and clouts stuck oil which can cause pollute soil and water environment	81.In case of transformer failure or oil change, the emergency oil and waste oil will be collected and stored in the emergency oil tank, then the operation unit (HCMC high voltage grid company) will contract with competent unit who has license for hazardous waste treatment, and the competent unit will pumped the oil into tankers then transport to factories for treat under regulation for hazardous waste. 82.In the annual test for transformer oil, if the oil sample is analyzed to not meet technical specification for operation, the oil will be filtered under the regulated procedure and conducted by the specialized and licensed unit	Transformer and around substation	Fulltime	Biannual	O and M	The high voltage grid management of Ho Chi Minh City	

A. Institutional Arrangements and Responsibilities

127. At the feasibility, stage in the primary management framework is responsible for the implementation of the environmental management plan (EMP) for the subproject is summarized as follows: The EVNHCMC is the executing agency (EA/PO). The PO is overall responsible for implementing the EMP with executive support from the Ho Chi Minh City Power Projects Management Board (PPMB) directly under the EVNHCMC being the implementing agency (IA) of the subproject. The PPMB under the direction of the PO implements the subproject and the EMP.

128. The PPMB is supported by the Project Implementation Consultant (PIC). The PIC assists in completion of the detailed subproject design, updates the EMP to address the detailed subproject design, and assist the implementation of the EMP. The PIC also provides required capacity development and training to the PPMB. The PPMB monitors and assists the work of the construction contractor who implements the EMP of the contractors (SEMP).

129. External support of the ES for the implementation of the EMP is provided by the international and national environmental specialists of the PIC, and an environmental monitoring consultant (EMC) it is necessary to conduct the field sampling and laboratory analyses of the environmental monitoring plan (e.g, water quality, air quality) of the EMP that cannot be performed by the contractor or the IA/EO. A summary of responsibilities for the implementation of the EMP is provided below.

130. Responsibilities of the EA/PO with support from the EVN include:

- Overall responsibility for the implementation of the EMP;
- Provide and coordinate to monitor environmental and social safeguards for the IA/EO;
- Maintain the communication with the EVN and the ADB on the implementation of the EMP; and;
- Coordinate with the IA/EO to resolve the issues arising from the implementation of the EMP;
- Submit every semi-annual monitoring reports to the ADB

131. Responsibilities of the EO directly under the IA include:

- Assist the PIC in updating the EMP to meet detailed subproject design;
- Notify the DoNRE to verify whether the subproject met the approvals of the GOV;
- Assist the PIC with inclusion of CEMP requirements in bidding documents for the contractors based on the updated EMP;
- Implement daily management of the EMP activities;
- Work with the EMC to prepare monitoring plan for the EMP;
- Ensure compliance with loan agreement and assurance in respect of the entire subproject, including the EMP (as well as PAPs, resettlement plan);
- Monitor the meetings with all affected stakeholders;
- Prepare and submit quarterly reports on the EMP implementation to the IA/EA;
- Monitor the implementation of the CEMP;

Coordinate with the international and national environmental specialists of the PIC for the EMP implementation;

Implement frequently construction site inspection to ensure that the contractor implements the CEMP properly; and

Ensure the environment staff of the contractor submits monthly report on mitigation measures and construction monitoring.

132. Responsibilities of the national environmental specialist of the PIC include:

- Provide technical direction and assist the EO/IA with the implementation of the EMP;
- Monitor design and implement capacity development and enhancement training for the EO/IA and environmental staff of the contractor(s);
- Provide advice and support to the EMC with their monitoring activities;
- Support to prepare and review all reports prepared by the EO/IA and the EMC for the EA and the ADB; and
- Review locations where may be contaminated near the subproject site.

133. Responsibilities of the Environmental Staff (ES) of the Contractor include:

- Supervise/monitor the implementation the SEMP of constructor and all mitigation measures mentioned in part VI and table 15 for the construction phase of the subproject; and
- Prepare and submit monthly reports on any environmental issue mitigation and monitoring activities related to environmental included in work contacts with PO, including the SEMP at the construction site.

134. Responsibilities of external Environmental Monitoring Consultant (EMC) include:

- Implement environmental sampling required for monitoring plan of the EMP that cannot be conducted by the contractor and the EO/IA/ES.
- Perform laboratory analyses (if necessary) for detailed monitoring program in the EMP; and;
- Prepare and submit quarterly reports or semi-annual environmental monitoring report on monitoring activities to the IA/EO.

135. Department of Natural Resources and Environment (DoNRE) is the provincial agency which monitors environmental management in the city. DoNRE along with the district staff will provide direction and support for environmental protection-relating issues including application of the Law on Environmental Protection, EIA, and environmental standards.

136. ADB provides guidance to the EA/IA with any issues related to the EMP, and reviews every 6-month reports on the EMP activities compiled and submitted by the EA.

B. Monitoring Plan

137. The environmental monitoring plan for the EMP is provided in Table 15. The monitoring plan focuses on all three phases (pre-construction, construction, post-construction operation) of the subproject and consists of environmental indicators, the sampling locations and frequency, method of data collection, responsible parties, and estimated costs. The purpose of the monitoring plan is to determine the effectiveness of

the impact mitigations, and to document any unexpected positive or negative environmental impacts of the subproject.

138. The external environmental monitoring consultant (EMC) identified above will implement the environmental monitoring program. The EMC will be responsible for the sampling of environmental parameters that must be analyzed in a laboratory. The ES and EO will coordinate with the EMC. The PIC/IU will provide logistical support to the EMC where necessary for the implementation of environmental monitoring plan.

139. The standards for ambient environmental quality (e.g., water and air quality) for Viet Nam listed in section III will be the foundation for preparing the monitoring program. The environmental standards provided by the Environmental, Health and Safety Guidelines of the IFC/World Bank (2007) should be based to supplement standards that are not provided by the GoV.

140. After construction is completed the potential impacts of the operation of the subproject will be monitored by EVNHCMC. Monitoring of the success of the minor resettlement in the affected areas will be undertaken as part of the separate RP prepared for the subproject.

C. Performance Monitoring

141. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 16.

D. Reporting

142. Regular reporting on the implementation of mitigation measures and on monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of IA/EO and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. The mitigation and monitoring plans (Tables 14 and 15) summarize proposed timing of reporting.

143. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/EO. The IA report will compile monthly reports provided by the ES of contractor, the reports of the EMC on monitoring, and input from the international and national environmental specialists of the PIC. The IA/EO report will also be sent to the DoNRE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 16), and will include relevant environmental quality standards as regulation.

Table 15. Environmental Monitoring Plan

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD
					Supervision	Implementation	
Pre-construction Phase							
a) Air quality: dust, CO, NO_2, SO_2, noise b) Affected surface water quality: pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform	a. Substation (including underground cable and connection column) b. Access road	Using field and analytical methods approved by DoNRE.	Once	Assessment of physical environment included in the IEE	PIC/PPMB	Consultant who preparing the IEE and the subproject	A&B: including in consultancy cost ($500)
Construction Phase							
a) Air quality: dust, CO, NO_2, SO_2, noise b) Affected surface water quality: pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform c) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps. d)Public comments and complaints e) Incidence of worker or public accident or injury	a and b): Baseline sites of pre-construction phase. c) At sites where contaminated soil is suspected. d) All construction sites and worker camps e) Using hotline number placed at construction areas	a-b) Using field and analytical methods in accordance with current regulations. Include visual observations of dust and noise from contractor and public reports. c) Visual observation d) Information transferred by telephone hotline number posted at all construction sites. e) regular reporting by contractors/PPMB	(a - c) Once per 3 month d) Continuous e) Continuous	monthly	(a - c):		
					PPMB	PPMB (Monitoring Consultant)	A & B: $ 1,500 C: $700
					(d & e) observation		
					PPMB	Contractor	D&E: Contractor
Operation phase							
Incidence of worker accidents, or maintenance of the ROW	The substation and underground cable	Regular documentation and reporting	Continuous		EVNHCM		O&M cost
Electromagnetic field monitoring	In the Substation and along the connection line	Equipment for measuring electromagnetic field	Biannual	Biannual	EVNHCM		

Table16. Performance Monitoring Indicators for Subproject

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Land acquisition and compensation	Mentioned in Table 14	Mentioned in RP	Mentioned in RP	Resettlement Due Diligence Document
Construction Phase				
Concentration of workers and domestic wastes generated	Mentioned in Table 14	Hygiene situation, availability of toilet and waste basket Residential register of workers Rainwater drainage system in worker camps Food safety regulations Educating and training about health and hygiene for workers	Rigorous program of procedures to manage worker's camp	EMC and contractor monitoring reports
Refused rock and soil, debrides, other hazardous wastes generated by rock and soil filling and excavation for tower foundation pits, cable trenches, tower installation, and equipment, devices, machines and transportation means	Mentioned in Table 14	Solid waste and liquid waste treatment system Hazardous waste: Oil, gasoline, grease collection and treatment license	- Rigorous program of procedures to manage and store all waste from construction camps and sites practiced, and manage earthworks. - Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	EMC and contractor monitoring reports,
Noise, dust and exhausts due to construction activities and transportation of materials	Mentioned in table 14	dust, CO, NO_2, SO_2, noise levels meet Vietnamese standards	The content must not exceed the level at pre-subproject. Complying with mitigation measures for water quality mentioned in table 15	EMC and monitoring report of contractors
Earthwork and leveling work causing soil erosion	Mentioned in Table 14	Earth dyke, Embankment were built; vegetation are grown on bare land	Land quality and minimize land slide or erosion	EMC and monitoring report of contractors
Construct drainage system of rainwater, water pumped from the foundation pits	Mentioned in Table 14	pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform levels meet Vietnamese standards	GoV environmental standards and criteria met Complying with mitigation measures for water quality mentioned in table 15	Monitoring by EMC

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Construction materials transportation, and storage	Mentioned in Table 14	Frequency of disruptions and blocked roadways is reduced Maintenance and operation method of equipment, machines, and vehicles	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
Power supply and other utilities due to underground cable connected to the national grid system	Mentioned in Table 14	Timing of power cut Methods of connecting to the existing transmission line Methods of constructing underground cable	Minimized time of power cut, effect on the existing TL and underground works.	EMC and monitoring report of contractors
Community and worker safety	Mentioned in Table 14	Frequency of injuries are reduced	Adherence to GoV occupational health and Safety regulations	Contractor reports
Detect cultural and historical properties or values	Mentioned in Table 14	cultural and historical properties are conserved	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, contractor reports, public input, EMC reports
Repair, restore, return the ground after construction completion	Mentioned in Table 14	Remain construction material at the site are collected Construction solid waste; un-clearance of worker camp etc. are cleaned.	Recovery of construction site; remove construction solid waste; clean worker camp etc.	Site observation; Contractor and EMC monitoring reports
Operation phase of transmission line				
Worker and community Safety	Mentioned in Table 14	Frequency of accidents, and spills is reduced Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHCMC
Hazardous waste from substation operation	Mentioned in Table 14	Frequently surveillance transformer oil and its operation Procedure of waste oil treatment	No happen or minimize transformer failure. In case of transformer failure or oil change (after 15 years of operation), the procedure or waste oil treatment must obey current regulations on hazardous waste treatment	EVNHCMC

IX. ESTIMATED COST OF EMP

144. The costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included with the construction costs in contractor bid documents. From Table 15 the preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for EVNHCMC/PPBM is approximately USD $3,700.00 which is summarized in Table 17.

Table17. Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre-construction Phase	
Baseline environmental quality	including in consultancy cost ($500.00)
Construction Phase	
Inspecting environmental quality	$ 1,500.00
inspecting environmental compliance	$ 700.00
Operation Phase	
Inspecting environmental quality (electromagnetic measurement)	O&M cost (average $1,000.00 per year)
Training and capacity development of EVNHCM / PPBM	$ 1,000.00
Total	**$ 3,700.00**

145. The environmental costs in Table 17 are for field sampling and laboratory analyses which include professional per diems of technicians.

146. An estimated budget of USD $1,000.00 is required for training of the PO/PPMB on environmental assessment and management, and the implementation of the EMP. The estimated costs of the EMP and training will need to be updated by the PIC in conjunction with the PPMB during the pre-construction phase.

X. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Public Consultation

147. A stakeholder consultation strategy was developed to meet the requirements of meaningful consultation as stipulated by the SPS (2009). The strategy embodied the principles of meaningful engagement, transparency, participation, and inclusiveness to ensure that affected and marginalized groups such as women, and the poor, were given equal opportunities to participate in the design of the subproject.

1. Identification of Stakeholders

148. Stakeholders were identified and engaged in a participatory manner. Stakeholder communication focused on institutional stakeholders, affected communities, and persons directly affected by proposed subproject interventions. The stakeholders of the subproject include:

- Institutional stakeholders such as: (i) People's committee of the city, (ii) People's committee of the precinct/district; (iii) Project management agency, (iv) PECC4, and (v) commune leaders;
- Organizations/unions/associations such as Women Union and Farmers Union which provided various information for the design of the subproject, and which might participate in implementation of measures and interventions;
- Households and enterprises living along the transmission line can be people who will be directly affected or be adversely impacted or can be people who will be received benefits from the determination and implementation of mitigation measures against adverse impacts, and
- Organizations, individuals affected by the subproject.

149. After identifying stakeholders of the subproject, the Consultant contact and cooperate with the commune/ward people's committee to send invitation for the relevant parties.

2. Public consultation meeting

150. Formal community consultation meetings were held to discuss the location and impact of the transmission line and substation for both environmental and social aspects Public consultations were held Linh Trung ward, Thu Duc district, HCMC dated November 4, 2014, with total of 6 participants (5 male and 01 female).

151. The public meeting consisted of the following three component procedures:

i. The engineering consultant introduced the subproject including the substation location, the route of underground cable, and the length of the cable that will traverse communes and wards;

ii. The environmental consultant presented ADB's environmental policy, safety regulations in the Vietnam power sector, anticipated environmental impacts and respective mitigation measures (to be developed in IEE), the grievance redress mechanism for environmental and resettlement problems; and

iii. The social/resettlement consultants presented: ADB's resettlement plan; impacts due to the acquisition land and properties; policies of GOV and local authorities, the Project's policies in compensation for loss as the state acquired land and properties on land; and Potential impacts due to land acquisition/resettlement.

152. During the meeting, people presented their questions and comments on environmental issues. PECC4's consultants answered and explained all questions of the participants

153. The participants of the public consultation meeting included Commune leaders, cadastral officer affected persons. The list of participants is stated in Appendix B.

3. Results of Public consultations

a. Comments from communal authorities

154. The comments/questions of local authorities/people were given as in the Table 18:

Table18. The comments/questions of local authorities/people during public consultation meetings

Location and time	Comments/questions from local authorities	Answers of Project owner and consultants company PECC4	Project Response (stated in EMP)
Linh Trung ward, dated 4 November 2014	The Subproject Owner and Construction Contractor will comply the regulations on environmental protection when implementing the subproject	This issue will be implemented	EMP defined that the local Authorities and APs will be informed on the Schedule Subproject.
	The Subproject Owner and Construction Contractor will ensure safety for workers, local people surrounding the subproject during the construction period, and have emergency measures when happening accidents.	IEE defined these issues and the Contractor is required to implement the safety measures and emergency response.	In the Table of Mitigation Plan - EMP stated the mitigation measures for the impacts related to the construction activities, including the implementation of Safety Plan for workers, and community.
	After completed the construction, recover the ground surface as clean as pre-construction	Agree	EMP defined the requirements on surface recovery as the pre-construction.
	Is it the compensation land area calculated according to the URC transmission line ROW?		As per RP
Conclusions	Linh Trung People's Committee agrees the plan to construct the subproject and requires the participants to implement following the meeting content.		Follow-up consultations of community views of subproject will occur.

B. Information disclosure

155. Formal disclosure to affected persons and stakeholders of information on the Thu Duc Water Plant 110 kV Substation and Underground Transmission Line that occurred during the IEE is meant to form the beginning of continued information disclosure and stakeholder involvement as the subproject is implemented. As part of the stakeholder communication strategy regular information exchange meetings with stakeholders are strongly encouraged throughout implementation of the subproject.

156. The IEE must be easily available to the stakeholders contacted during examination in written and verbal forms in local language of Vietnamese. At a minimum the Executive Summary of the IEE should be translated to local language and distributed to all APs. The IEE should be available on the EVNHCMC website, at the EVNHCMC office in Ho Chi Minh, and at the subproject sites. Similarly, all subproject reporting with specific reference to stakeholder consultation minutes, environmental monitoring, and reports on EMP implementation released by the EA/IA should be available at the same offices and websites. The IEE will be available on the ADB website as well as EMP reporting that is prepared by the EA/IA after implementation begins.

157. The people's committees of Linh Trung ward, and affected people were received the draft IEE in Vietnamese version during the public consultation process. The final IEE (after receiving the letter of No objection from ADB) will be translated into Vietnamese language, then send to each ward people's committees for disclosure. By doing this, local people and local authorities can easily refer the final IEE.

XI. EMERGENCY RESPONSE PLAN

158. The Contractor must develop emergency or incident response procedures during construction and operation phases of the new Thu Duc water plant 110 kV Substation and connection line to protect workers and the public. The emergency response plan (ERP) outlines the roles and responsibilities of persons from first identification of an incident or emergency to the final steps of safe and complete closure of the situation. The detailed requirements for the ERP are described in Appendix C.

XII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

159. Currently there is insufficient experience and capacity for environmental assessment and management in EVNHCMC for the implementation of the EMP, and to develop future safeguards for the non-core subprojects. The PIC with assistance from the PPMB of the subproject will develop and deliver training courses to the IA staff including the contractor. The purpose of the course(s) is to strengthen the ability of the subproject owner including the PPMB to oversee implementation of the EMP by construction contractors, and EMC. Costs for training should be included with costs for implementation of the EMP.

160. Training on the implementation of an EMP should address two thematic areas. The first area should be principles environmental assessment and management focused on the potential impacts of subproject activities on the natural and social environments. The second area should be environmental safeguard requirements of the ADB and GoV with specific reference to the EMP.

XIII. CONCLUSIONS AND RECOMMENDATION

161. The initial examination of the Thu Duc water plant 110 kV Substation and connection line subproject in HCMC indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

162. The public consultation meetings underscored the need for effective management of construction impacts such as noise, dust, traffic disruptions, and public safety. Follow-up meetings with the consulted stakeholders to address any construction-related issues are required. The civil construction impacts of elevated dust, noise, traffic disruptions, erosion and sedimentation, and public and worker safety can be managed effectively with standard construction practices (e.g., IFC/World Bank 2007).

163. The IEE concludes that the description of the feasibility design of the subproject combined with available information on the affected environment is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes do not occur to the design of one or more of the subproject components, and that new sensitive environmental or PCR components are not identified in pre-construction phase, further detailed environmental impact assessment (EIA) of the subproject is not required.

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ANNEXS

A. Rapid Environmental Assessment (REA) Checklist
B. Minutes of Public Consultation Meetings
C. Related Correspondences
D. Emergency response plan
E. Vietnamese EIA certificate
F. Letter on UXO situation in the subproject

Annex A : Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Preparing the Ha Noi and Ho Chi Minh City Power Grid Development Sector Project TA 8205-VIE
Sector Division:	Thu Duc water plant 110kV substation and connection line

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		X	
▪ Protected Area		X	
▪ Wetland		X	
▪ Mangrove		X	
▪ Estuarine		X	
▪ Buffer zone of protected area		X	
▪ Special area for protecting biodiversity		X	
B. Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	The subproject will not cut through the temples and cemetery. The contractors will manage and ban their workers to encroach into these sites. The Project owner and contractors will strictly implement mitigation measures in construction phase
▪ Encroachment on precious ecosystem (e.g. sensitive or protected areas)		x	
▪ Alteration of surface water hydrology of waterways crossed by roads and resulting		x	There is no river, stream flowing through the project

Screening Questions	Yes	No	Remarks
in increased sediment in streams affected by increased soil erosion at the construction site?			area
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?		x	There are no submarine cables to be installed by the project.
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		x	Construction water will settled down in grid chamber before flow into the city's drainage, and treated concentrative before discharging outside.
▪ increased local air pollution due to rock crushing, cutting and filling?		x	There is no rock crushing, cutting in the project. However, rock is used to mix concrete and filled into dug channel. The mitigation measures will be implemented to reduce air pollution
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	x		To minimize potential risks, an Occupational Health and Safety Plan (OHSP) will be developed and implemented.
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?		x	
▪ noise and vibration due to blasting and other civil works?		x	Minor impact level due to noise and vibration occurred during road cutting and movement of construction vehicles along access road in construction phase
▪ dislocation or involuntary resettlement of people?		x	The project affects only agricultural land without houses/accommodations
▪ dis-proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	x		Small impacts. Due to increase of vehicle density on roads. No cause obstacles of traffic because of no construction on road.
▪ hazardous driving conditions where construction interferes with pre-existing roads?	x		Small impacts
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		x	

Screening Questions	Yes	No	Remarks
▪ dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		x	No overhead TL
▪ environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?		x	
▪ facilitation of access to protected areas in case corridors traverse protected areas?		x	
▪ disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		x	
▪ large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	
▪ social conflicts if workers from other regions or countries are hired?	x		Hiring workers to the project construction site will cause some impacts on local communies.
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	x		Small impact. Waste volume is small, and contractors will hire competent unit to collect and treat as regulation
▪ risks to community safety associated with maintenance of lines and related facilities?		x	The connection line locates within in the substation rounding by fence. So maintenance will not cause risk to communities.
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?	x		Small impact - Underground cable is designed according to the electromagnetic current standards should not impact public health. Risk of subsidence at cable cellar may occur if heavy trucks illegal run through the road, or by the construction of other infrastructure systems. - Electromagnetic field of the substation will not affected surrounding communities because the wall serves as a safety corridor.
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		x	

Screening Questions	Yes	No	Remarks
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	x		Low risk level. These risks may be happen only at locations of the connecting tower No.44b of the substation. The tower may be collapsed due to typhoons or tropical cyclones. The underground cable may cause risks of power shock, cable broken when it happen earthquake, but this hazard will rarely appear in this project area and the project was designed to probably stand the earthquake. Also, in the process of maintenance, the operate unit will conduct regular inspection for timely detection and treatment.

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks	Yes	No	Remark
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?	x		The project area has been suffered by local flood due to rain (flooded level about 20-30 cm). This is because of the effects of the urbanization process in the region. Also, the area has elevation about 5-10m which can be affected by tides and sea water level rises due to climate change.
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		X	
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		X	
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area		x	

(e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?			

Annex B

THE SOCIALIST REPUBLIC OF VIETNAM

Independence – Freedom – Happiness

Linh Trung ward, 4 November 2014

MINUTES OF PUBLIC CONSULTATION

Re: meeting on initial environmental examination, and resettlement plan

Subproject: Thu Duc water plant 110kV substation and connection line

Location: meeting room of Thu Duc water plant B.O.O JSC

Time & Date: 14h00 on 04 November 2014

I. Participants

1. Representatives of people's committee: Linh Trung ward – Thu Duc district
- Mr./Ms. Huynh Thi Kim Thoa Job title: vice chairman of the ward PC
- Mr./Ms. Nguyen Dinh Huan Job title: officials

2. Representatives of PECC4
- Mr./Ms. Nguyen Van Thanh Job title: engineer

3. Representatives of APs
- Nguyen Minh Tin Job title: Technical director of Thu Duc water B.O.O JSC
- Total number of participants: 6 (details in the attached list)

II. Contents of the meeting

1. Representatives of PECC4 presented that the reasons of the meetings is public consultation of resettlement plan (RP) and environmental management plan (EMP)
2. Representatives of PECC4 presented the following contents:
   a. The project's information
   b. The project description (in construction and operation phase)
   c. The project's impacts on environment, socio-economy
   d. Compensation, resettlement and policies of Asian Development Bank and GOV
   e. Compensation, resettlement plan
   f. Relevant complaints and grievance
   g. mitigation measures and monitors for the project's impacts on environment
3. Feedbacks and comments of participants

3.1. Comments on the resettlement plan

- Suggesting that PO pays initial investment cost for the acquired land to Thu Duc water B.O.O JSC
- Suggesting that the PO tightly cooperates with the locality and Thu Duc water B.O.O JSC in compensation and site clearance

3.2. Comments on environmental management plan

- The PO and civil work contractors have to comply with regulations on environmental protection during the project implementation
- The PO and civil work contractors ensure safety for workers and local people living near to the project during the construction and having respond actions for incidents.
- Returning the site as same as the pre-project after finishing the construction

4. Conclusion

- Agreeing with the project construction

- Suggesting the relevant parties have to right implement provisions mentioned in the meeting.

5. The meetings ended at 15h30 on 04 November 2014

Writer	**Representative of affected household/institution**
Signed Nguyen Van Thanh	Signed Nguyen Minh Tin
Representative of PECC4	**Representative of Linh Trung ward people's committee**
Signed Nguyen Van Thanh	Signed Huynh Thi Kim Thoa

LIST OF PARTICIPANTS OF PUBIC CONSULTATION

RESETTLEMENT PLAN (RP) AND ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Date : 4th November 2014

Location: the office of Thu Duc water B.O.O JSC

No.	Name	Organization/Address	Position	Remark
1	Nguyen Thanh Vang	Linh Trung ward people's committee	Vice chairman	
2	Huynh Thi Kim Thoa (female)	Linh Trung ward people's committee	Vice chairman	
3	Vu Dinh Huan	Linh Trung ward people's committee	Official	
4	Pham Van Tu	Linh Trung ward Fatherland Front Committee	Vice chairman	
5	Le Phuc Hien	Thu Duc B.O.O JSC	General director	
6	Nguyen Minh Tin	Thu Duc B.O.O JSC	Technical director	

Figure: Consultation meeting with Thu Duc water BOO JSC and Linh Trung ward PC

Figure: Contacting and meeting with Linh Trung ward PC

Annex-C

HO CHI MINH PEOPLE'S COMMITTEE
SAI GON WATER SUPPLY ONE MEMBER LIMITED LIABILITY CORPORATION

No. 431/CV-TCT-KTCN
Compendium: receiving allocation for the construction of a 220 / 110kV substation for Thu Duc Water Plant cluster

SOCIALIST REPUBLIC OF VIETNAM
Independence - freedom – Happiness

Ho Chi Minh City, 06 February 2013

To: Ho Chi Minh City power Corporation (EVNHCMC)

- Pursuant to Decision No. 6498/QD-BCT date 09 December 2010 on approval of "Ho Chi Minh City power development master plan in period of 2015 to 2020"
- Pursuant to Letter No. 182/SCT-QLNL dated 10 January 2012 on amendment, supplement to construction a new 110/220kV water plant substation
- Pursuant to Letter No. 3683/ALD-CBDT dated 21 September 2012 on review the location of the 110kV water plan substation and connection line
- Pursuant to letter No. 02/2013/KH-BOO dated 30 January 2013 of Thu Duc water BOO JSC on land allocation for the construction the substation for Thu Duc water plan cluster.

Reply to information on the site within the area of Thu Duc water BOO plant for constructing the substation supplying electric for water plants, Thu Duc water BOO JSC has agreed to allocation of land with the area of 4,452 m^2 as verified in the drawing "map of the land site allocating for power sector" established by CII Company, and requested EVNHCMC and Sai Gon water supply corporation to implement works relevant to land allocation, return fees for national budget, compensation and site resettlement cost which was paid in previous stage.

According to HCMC power development master plan and the adjustment for supplement of the 220/110kV water plant substation which approved by Ministry of Industry and Trade. EVNHCMC has been assigned to manage the substation project implementation, and Sai Gon water supply Corporation has suggested EVNHCMC to be the owner of the substation (at letter No. 3904/CV-TCT-KTCN dated 26 September 2011). Now, Thu Duc water BOO JSC has agreed to allocate the substation site, Sai Gon water supply Corporation notify EVNHCMC to receive and prepare the plan for acquiring land from Thu Duc water BOO JSC to instigate the substation construction for the development of units.

Respectfully notify./.

Deputy General Director
Signed and stamped

E. Vietnamese EIA certificate

The EIA report is in the process of approval of HCM DONRE, the appraisal committee is expected to meet and approval the EIA report on 22 Jan 2016

F. Letter on UXO situation in the subproject

SOCIALIST REPUBLIC OF VIETNAM
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TDW
No. 25/2014/CV-TDW

Ho Chi Minh City, 17 June 2014

To: Power engineering Consulting JSC 4 – South Branch (PECC4)
(Re: information on underground structures at proposed site of the project "Thu Duc water plant 110kV substation")

Thu Duc water B.O.O JSC (TDW) has replied your letter No. 139/TVD4-CNPN on information to implement the feasibility study of the 220/110kV water plant substation in Thu Duc district as follows"

- At present, according to the current data in TDW, there is no any underground structures at the proposed project site under the drawing attached to the letter No. 139/TVD4-CNPN.
- In 2005, the proposed project site was been detected and clear mine by TDW in the time of construction of the water plant.

In addition, TDW suggests that you have a plan of paying fees which TDW paid for national budget and other cost related to compensation and site clearance. The plan have to be agreed by TDW before you carrying out relevant activities of the project " Thu Duc water plant 110kV SS" on this site. During construction and operation, you have to ensure safety and no affect TDW's activities.
Sincerely,

General Director
Signed and stamped

Le Phuc Hien

TDW
Better Service For Life

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

Số: 25 /2014/ CV-TDW

TPHCM, ngày 17 tháng 6 năm 2014

Kính gửi: **CÔNG TY CP TƯ VẤN XÂY DỰNG ĐIỆN 4**
CHI NHÁNH PHÍA NAM

(V/v: Xin thông tin công trình ngầm tại khu đất dự kiến xây dựng dự án "TBA 11kV NMN Thủ Đức")

Công ty Cổ phần B.O.O Nước Thủ Đức (TDW) xin phúc đáp Công văn số 139/TVĐ4 – CNPN về việc hỗ trợ thông tin để thực hiện công tác lập dự án đầu tư xây dựng trạm biến áp 220/110kV cho cụm nhà máy nước khu vực Thủ Đức của Quý Công ty như sau:

- Hiện tại, theo những thông tin được lưu trữ tại TDW thì không có các công trình ngầm hiện hữu tại khu vực dự kiến xây dựng trạm theo bản vẽ mà Quý Công ty đã đính kèm theo công văn số 139/TVĐ4 – CNPN.
- Tại khu vực dự kiến xây trạm, vào năm 2005 trong quá trình dự án xây dựng nhà máy nước, TDW đã thực hiện công tác thăm dò bom mìn nhằm đảm bảo an toàn xây dựng.

Ngoài ra, TDW đề nghị Quý Công ty có phương án hoàn trả phần chi phí mà TDW đã nộp vào ngân sách và các chi phí phát sinh liên quan để thực hiện đền bù giải phóng mặt bằng đối với phần diện tích thuộc quyền quản lý của TDW dự kiến bàn giao cho Quý Công ty xây dựng trạm biến áp 220/110kV. Phương án này phải được sự chấp thuận của TDW trước khi Quý Công ty tiến hành các hoạt động liên quan phục vụ cho dự án "TBA 11kV NMN Thủ Đức" trong khu đất này. Trong quá trình thi công, vận hành trạm biến áp, Quý Công ty phải đảm bảo an toàn và không làm ảnh hưởng đến hoạt động của TDW.

Trân trọng.

Nơi nhận:
- *Như trên;*
- *Tổng Công ty cấp nước Sài Gòn TNHH MTV(Saweco);*
- *Lưu*

TỔNG GIÁM ĐỐC

CÔNG TY CỔ PHẦN B.O.O NƯỚC THỦ ĐỨC

LÊ PHÚC HIỀN