Initial Environmental Examination

Project Number: 46391-001
May 2017

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

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

INITIAL ENVIRONMENTAL EXAMINATION

May, 2017

LOAN 3161-VIE: HA NOI AND HO CHI MINH CITY POWER GRID DEVELOPMENT SECTOR PROJECT

220KV TAN CANG SUBSTATION

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

ABBREVIATIONS

ADB:	Asian Development Bank
ADB SPS	the ADB's Safeguard Policy Safeguard Policy Statement (2009)
BOD:	Biochemical Oxygen Demand
CEMP:	Construction/Contractor Environmental Management Plan
CHSP:	Community Health and Safety Plan
CPC:	Ward/Commune People's Committee
CSC:	Construction Supervision Consultant
COD:	Chemical Oxygen Demand
DoCST:	Department of Culture, Sports and Tourism
DoNRE:	Department of Natural Resources and Environment
DPC:	Precinct/District People's Committee
EA/IA:	Executing Agency/Implementation Agency
EIA:	Environmental Impact Assessment
EMC:	Environmental Monitoring Consultant
EMF:	Electromagnetic Field
EMP:	Environmental Management Plan
ESU:	Environmental and Social Unit of HCMCPMB
EVN:	Vietnam Electricity
EVNHCMC:	Ho Chi Minh City Power Corporation
ENVHANOI:	Ha Noi Power Corporation
HCMC:	Ho Chi Minh City
HCMCPMB:	Ho Chi Minh City Power Projects Management Board
IEE:	Initial Environmental Examination
LEP 2014:	Law on Environmental Protection 2014
MoD	Ministry of Defense
OHSP:	Occupational Health and Safety Plan
PCB:	Polychlorinated biphenyls
PECC2:	Power Engineering Consulting Joint Stock Company 2
PIC:	Project Implementation Consultant
PPC:	Provincial People's Committee
PPE:	personal protective equipment
REA:	Rapid Environmental Assessment
TSS:	Total Suspended Solids
UXO:	Unexploded Ordnance

CURRENCIES

(rate of exchange of March 2017)

Currency Unit	–	VND
$1,00	=	22,790 VND

NOTE

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

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I. 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 Ho Chi Minh City through the rehabilitation and development of the 110 kV and 220 kV transmission line to supply its 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 220kV Tan Cang substation subproject in HCMC which is one of 28 non-core subprojects of the EVN proposed by Hanoi Power Corporation (EVNHANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). These 28 non-core subprojects were classified Category B for environment. The subproject consists of construction of a new 220kV Tan Cang substation, located in ward 22, Binh Thanh district of HCMC. The IEEs of the other non-core subprojects are prepared separately.

A. Subproject Summary

3. 220kV Tan Cang substation subproject will be located in the second infrastructure planned region of Sai Gon – Tan Cang Complex Area in ward 22, Binh Thanh district of Ho Chi Minh city. The subproject will be constructed with the total area of 2,928 m^2.

4. Objectives of the subproject is to (i) supply power stably at Tan Cang region (including Tan Cang and Ba Son on the west bank of Sai Gon River) and at the central region of district 1 (including district 1, 3, Binh Thanh and Go Vap districts); (ii) reduce power losses and improve quality of energy and enhance the reliability and safety of electricity supply. Additionally, construction of the subproject will also supply power for the 110kV substations such as Metro Tan Cang 110kV substation, Ba Son 110kV substation (double-circuit), Tan Cang 110kV substation, Thu Thiem 1 110kV substation (double-circuit), An Phu 110kV substation (single-circuit) and Xa Lo 110kV substation (double-circuit) etc.

B. Potential Impacts and Mitigation Measures

5. The IEE of 220kV Tan Cang substation indicates that the potential environmental impacts of the subproject are restricted in the construction phase of the subproject components. The common construction-related disturbances such as noise, dust, erosion, sedimentation, soil and liquid waste pollution, worker camp issues, reduced access, increased vehicles/transportation means and traffic road disruptions, increased risk of worker and resident injury can be managed with standard construction practices and management guidelines (e.g., IFC/World Bank 2007). 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. The subproject will be constructed in areas of 2,928 m^2, in which, 2,229 m^2 is in the second infrastructure planned region of Sai Gon – Tan Cang Complex Area in ward 22, Binh Thanh district of Ho Chi Minh city and 996 m^2 is in the protective corridor of Sai Gon river. This site was managed by Tan Cang Sai Gon Corporation and was delivered to the subproject's owner according to the Letter No.4394/BQP/TM dated 7 June 2014 of Ministry of Defense (MoD). Clearance of the site was completed before delivering to the owner so no household was affected by the subproject. Additionally, the subproject will provide an access road for substation's operation. Area of the access road will be 281m^2 in the greenery land area of Vinhomes Apartment, which is owned and managed by Vingroup Corporation under the agreement of parties (Vingroup Corporation, the subproject's owner and local authority).

7. The construction-related disturbances to environment and community are mainly the short-term disturbances caused by constructing the new substation. No cumulative environmental impacts will be occurred. Mitigation measures for these impacts are stated in details in Part VI of this report.

8. The Environmental Management Plan (EMP) prepared for the subproject provides comprehensively impacts, mitigation measures 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 Ho Chi Minh City Power Projects Management Board (HCMCPMB)'s Environmental Officer in environmental management and assessment as focused on the implementation of the EMP.

C. Conclusions

9. The IEE concludes that the feasibility study establishment of the subproject combined with available information on affected environment is sufficient to identify the scope of potential environmental impacts of the subproject. In technical design phase, significant changes to the subproject description do not occur, thus new potential environmental impacts, sensitive cultural issues are not arisen, and further detailed environmental impact assessment (EIA) is not required.

II. INTRODUCTION

A. Background of the IEE

10. Ha Noi and Ho Chi Minh City Power Grid Development Project 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 220kV and 110kV high-voltage power transmission systems and substations and associate to medium voltage supply for the power distribution system of the two cities. The Project also aims to strengthen the institutional capacity of Ha Noi Power Corporation (EVNHANOI) and Ho Chi Minh City Power Corporation (EVNHCMC).

11. The Project in Ha Noi and Ho Chi Minh City consists of 28 non-core subprojects that were originally defined by the Viet Nam Electricity (EVN).

12. This IEE is prepared for the new-constructed subproject of 220kV Tan Cang substation which is expected to be constructed in ward 22, Binh Thanh district of Ho Chi Minh city.

B. Assessment Context

13. The subproject was classified Environmental Category B under the ADB's Safeguard Policy Safeguard Policy Statement (2009) (ADB SPS). A category B project will have potential adverse impacts that are less adverse than the impacts of category A project and can be mitigated with an EMP.

14. This IEE is prepared for 220kV Tan Cang substation subproject in the detail design stage and the subproject combined with available data and information on affected environments is sufficient to identify the scope of potential environmental impacts of the subproject. Thus, as long as new sensitive environmental or cultural resources are not determined, so EMP that was prepared for the subproject in Part X of this IEE does not need to be updated.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

15. 220kV Tan Cang substation subproject will be implemented under the directions for use of Official Development Assistance (ODA) of the Government of Viet Nam, Decree No. 38/2013/ND-CP dated 23 April 2013 on directions for management and use of ODA and concessionary loans of Donors, and in accordance with the provisions of the Project.

A. Viet Nam Legislation, Policies, Decrees and Standards for Environmental Assessment

16. The Law on Environmental Protection of Vietnam (2014) (LEP 2014) prescribes the requirements for environmental assessment for developing domestic projects and considering impacts on natural and social environment. Government Decree No.18/2015/ND-CP on environmental protection master plan, strategic environmental assessment (SEA), environmental impact assessment (EIA), and EMP in conjunction with Circular 27/2015/TT-BTNMT dated 29 May 2015 on stipulation on specific articles of Decree No.18 both elaborate the environmental assessment requirements specified by LEP 2014. The legal documents on directions for environmental assessment and protection in Viet Nam that are referred on the report are listed as follows:

1. Legal documents on environmental protection

- Environmental Protection Law No.55/2014/QH13 of the 13th National Assembly, the 7th Session, passed on Jun. 23th, 2014.
- Decree No. 18/2015/ND-CP dated February 14th, 2015 of the Government on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Plan;
- Decree No.38/2015/ND-CP dated April 24th,2015 of the Government on waste managment;
- Circular No.27/2015/TT-BTNMT dated on 29th May 2015 on strategy environmental assessment, environmental impact assessment, and environmental protection plan;
- Circular No.36/2015/TT-BTNMT dated June 30th, 2015 issued by the MONRE regarding the hazardous wastes management.

2. Legal documents on electricity

- Electricity law No. 28/2004/QH11 dated December 03rd, 2004;
- Law on modification, supplementation on some articles of the Electricity Law No. 24/2012/QH13 issued by the National Assembly of the Socialist Republic of Vietnam, dated November 20th, 2012;
- Decree No.14/2014/ND-CP dated Feb. 26th, 2014 promulgated by the GOVERNMENT OF VIET NAM regarding the detailed regulation on the implementation of the Electricity Law on electric safety, put into force from Apr. 15th, 2014;
- Circular No.31/2014/TT-BCT dated Oct. 2nd, 2014 issued by the Ministry of Industry and Trade (MOIT) regarding the detailed regulation on some contents of electrical safety.

3. Other related legal documents

- Decree No. 45/2013/ND-CP dated May 10th 2013 of the Government regarding the detailed regulation on some articles of the Labor Code on working hours, rest hours, occupational safety and occupational hygiene.
- Circular No.22/2010/TT-BXD dated Dec. 3rd, 2010 issued by the Ministry of Construction (MOC) regarding the regulation on labour safety during the project construction process.

- Decision No.3733/2002/QD-BYT issued by the Ministry of Health dated October 10th, 2002 regarding the promulgation of 21 labour hygiene standards, 5 principles and 7 labour hygiene measurements.

4. Environment Standards and Regulations

- QCVN 05:2013/BTNMT - National technical regulation on ambient air quality;
- QCVN 26:2010/BTNMT - National technical regulation on noise;
- QCVN 27:2010/BTNMT - National technical regulation on vibration;
- QCVN 08-MT:2015/BTNMT - National technical regulation on surface water quality;
- QCVN 14:2008/BTNMT - National technical regulation on domestic wastewater;
- QCVN QTD-5: 2009/BCT - National technical regulation on electrical engineering - electrical equipment verification of the system;
- QCVN QTD-6: 2009/BCT - National technical regulation on electrical engineering - electrical equipment maintenance, repair and operation of the system;
- QCVN QTD-7: 2009/BCT - National technical regulation on electrical engineering - Power project construction;
- QCVN 07:2009/BTNMT - National technical regulation on hazardous waste thresholds.

5. Directions of Electricity Industry and Information for 220kV Tan Cang substation

- Decision No.1208/QD-TTg dated July 21st, 2011 of the Prime Minister of the Government approving the National Master Plan for power development for the 2011-2020 period with the vision to 2030;
- Decision No.428/QĐ-TTg dated March 18th, 2016 of the Prime Minister of the Government approving the adjusted master plan on national electricity development in the 2011-2020 period with the considerations up to 2030;
- Decision No.2631/QD-TTg dated December 31st, 2013 of the Prime Minister of the Government approving the Master Plan on socio-economic development of Ho Chi Minh city through 2020 with the vision toward 2025;
- Decision No.6493/QD-BCT dated December 9th, 2010 of Minister of Trade and Industry approving the plan for power development of Ho Chi Minh city for the 2011-2015 period with the vision toward 2020;
- Decision No.3344/QD-BCT dated April 07th, 2015 of the Ministry of Trade and Industry regarding on adjustment and supplement of power development plan of Ho Chi Minh city for the 20111-2015 period with the vision to 2020;
- Letter No.4394/BQP/TM dated June 7th,2014 of MoD regarding on the land use right of the People's Navy in Binh Thanh district of Ho Chi Minh city;
- Letter No.3608/SQHKT-HTKT dated October 23rd, 2013 of Department of Planning and Architecture regarding on selection of location alternatives and scope of 220kV Tan Cang substation at Tan Cang Sai Gon Complex-Area in ward 22 of Binh Thanh district;
- Letter No.6015/UBNDTP-DTMT dated November 15th, 2014 of Ho Chi Minh City People's Committee regarding on the construction location and scope of 220kV Tan Cang substation at Tan Cang Sai Gon Complex-Area in ward 22 of Binh Thanh district.

B. ADB Safeguard Policy

17. ADB SPS along with the ADB Environmental Safeguards, A Good Practice Sourcebook, 2012 clarifies the rationale, scope and content of an environmental assessment 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.

18. 220kV Tan Cang substation subproject is assessed as category B which is necessary to prepare an IEE. Appendix A presents the Rapid Environmental Assessment (REA) of the subproject.

IV. DESCRIPTION OF SUBPROJECT

19. 220kV Tan Cang substation will be designed as a GIS type; all equipment will be installed indoor, except the transformer will be provided outdoor. The substation is designed according to the unmanned duty type. Total area of subproject's construction will be 2,928 m^2. Location of the subproject is shown in ***Figure 1*** and ***Figure 2*** of the report.

20. Voltage of the subproject:

- 220kV side is to transit capacity for national power system;
- 110kV side is to distribute into the adjacent substations;
- 22kV side is to supply power for auto-power system of substation and load at Tan Cang and adjacent regions.

21. Scope of the subproject includes as follows:

A. Substation

22. The subproject will be constructed a new substation with total area of 2,928m^2, which includes 2,229 m^2 in the Tan Cang complex area and 699m^2 in the corridor of Sai Gon River. The equipment includes:

(i) Two 220kV transformers with each nominated capacity of 250MVA;

(ii) Two 110kV transformers with the each nominated-capacity of 63MVA.

23. The substation will be designed in accordance with unmanned type and all fittings and equipment will be installed indoor, except the transformers. The details are as follows:

a. 220kV and 110kV switchgears use indoor SF6 type;

- 220kV side: the number of 220kV distribution bay will be 08 bays. They all will be installed in this phase. The details are: 02 bays for underground cable line to connect into Cat Lai 220kV substation; 02 bays for underground cable line to connect into Thu Thiem 220kV substation; 02 bays for 220kV-250MVA transformer; 01 bay for bus coupler; 01 bay for voltage transformer and bus bar of connector;
- 110kV side: The number of 110kV distribution bays will be 14 bays; they all will be installed in this phase. The details are: 02 bays to connect into Ba Son 110kV substation; 02 bays to connect into Thu Thiem 3 110kV substation; 02 bays to connect into Xa Lo 110kV substation; 01 bay to connect into An Phu 110kV substation; 01 bay to connect into Metro Tan Cang 110kV substation; 02 110kV in-coming bays of 220/110kV-250MVA transformer; 02 110kV in-coming bays of 110/22kV-63MVA transformer; 01 bay for bus coupler; 01 bay for voltage transformer and bus bar of connector.

b. 22kV switchgears use indoor metal clad

- 22kV side: the number of cubicles is 22 sets for two 110kV transformers; they all will be installed in this phase. The details are: 02 in-coming cubicles; 02 voltage transformers; 12 out-going cubicles; 02 out-going cubicles for auto transformer; 02 out-going cubicles for capacitor; 01 bus riser; 01 bus coupler.

B. Access road

- The subproject will also be constructed an access road with total area of 281m^2. The access road will start from gate of substation connecting into D11 street of Tan Cang Sai Gon Complex Area of 30m in length and 9.4m in width.

24. The existing environment, land use and location of the subproject is described in Table 1.

Table 1 The existing environment, land use and location of the 220kV Tan Cang substation

No.	Subproject component	Location	Description of Subproject component	Land Use
1	Substation	At ward 22, Binh Thanh district of Ho Chi Minh city.	220kV Tan Cang substation subproject will be located in the second infrastructure planned region of Sai Gon – Tan Cang Complex Area. Area located inside of Sai Gon river corridor will use as the domestic traffic and fence of the substation in accordance with Decision No.150/2004/QD-UB on 06/9/2004 of Ho Chi Minh City People's Committee regulating management and use the corridor of river, canal, ditch in region of Ho Chi Minh city.	- Terrain is rather flat. Land use is legal. Currently, all of land for the construction of substation is vacant land, no vegetation thereon. The surrounding area is the big construction site of Vinhomes Central Park Residence, so no vegetation is found there. Small area of urban greenery is found under the Sai Gon bridge that is 25 m off the substation site. - Elevation changes from 1.0-2.5m and far 50m from the Sai Gon River. Ground foundation is concrete and crushed stone of 2x4. - There is no house and structure in region of the subproject. Location of substation was cleaned and leveled. - The adjacent structures are apartments of Vinhomes under the management of Vingroup that are under construction, so no resident lives there yet. Distance between substation and these apartments is greenery lane with 21m in width and D11 street of 6m in width. This greenery lane is planted and planned by Vingroup Corporation.
2	Access road	At ward 22, Binh Thanh district of Ho Chi Minh city.	Construction of an access road to use during the subproject's implementation process and substation's operation.	According to the agreement of the meeting between the owner, Vingroup Corporation and relevant authority, the access road of substation will be 30m in length and 9.4m in width with total of 281m^2. It will start at gate of substation and connect into D11 street. The land area for access road is in the yard planned plot of Vinhomes Central Park Residence. Currently, this is the vacant land in the area under construction.

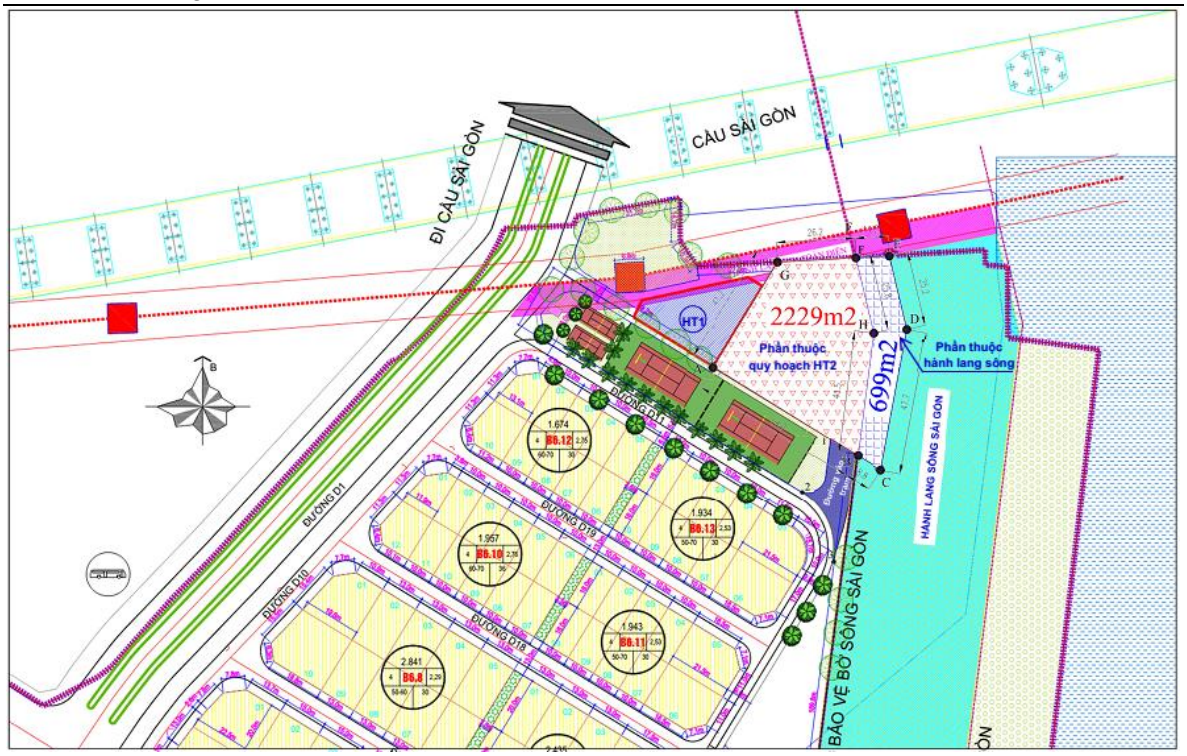

Figure 1. 220kV Tan Cang substation layout

Figure 2. Location of the 220kV Tan Cang substation on Google map

C. Civil Works

1. Quantity of Civil Works

25. Civil work quantity of 220kV Tan Cang substation and access roads is described in Table 2:

Table 2 Quantity of civil works

No.	Content of Civil works	Unit	Quantity	Construction Method
I.	**Preparing for construction**	**m^2**	**4,165**	
1	Construction area of substation	m^2	2,928	Manually + Machinery
2	Area of access road	m^2	281	Manually + Machinery
II.	**Removing UXO**	**m^2**	**4,165**	
1	Substation location	m^2	2,928	Manually
2	Access road location	m^2	281	Manually
III.	**Excavation**	**m^3**	**6,414.67**	Manually + Machinery
1	Civil works	m^3	5,649.11	
2	Leveling works	m^3	306	
3	Road works outside substation	m^3	459.56	
IV.	**Backfill and leveling**			Manually + Machinery
1	Soil backfill of civil works	m^3	2,077.73	
2	Sand backfill of leveling works	m^3	2,669.91	
3	Sand backfill of access road	m^3	141.08	
V.	**Spun concrete pile and cast-in-situ concrete pile**			Manually + Machinery
1	Spun concrete pile, 30x30	m^3	4,332.90	
2	Spun concrete pile, 25x25	m^3	15,867.90	
3	Cast-in-situ concrete pile, D600	m^3	1,600	
VI.	**Concrete**	**m^3**	**3,359.07**	Manually + Machinery
VII.	**Formwork**			
1	Formwork	m^3	247.49	
VIII.	**Reinforcement**			
1	Reinforcing round steel	ton	426.39	Cast-in-situ
IX.	**Erection**			
1	Galvanized reinforcement	ton	103.03	Manually
X**.**	**Civil work**			Based on m^2 of construction
1	Control room	m^2	392	

2. Construction Method

26. *Leveling*: the ground of the subproject construction area was leveled elementarily in the ground leveling for construction of Vinhomes Central Park Residence. The substation ground will be leveled further to reach to its design altitude. The leveling sand will be purchased from selling agents of construction materials in Bien Hoa City and Dong Nai, transported to the site by Saigon River waterway and pumped into the substation's site. The construction contractor must pay attention to division of leveling areas to ensure taking of testing samples of foundation compactness. After finishing leveling, the construction contractor must hire a competent company having legal entity to take test samples for inspection of compactness and acceptance later on.

27. *Excavation of foundation*: The substation's base is on weak soil, the friction angle is small, therefore, the slope excavation is 1:0.5 for the foundations with the depth ≤ 2m and the slope excavation is 1:0.75 for the foundations with the depth > 2m. Excavated soil

must be disposed outside the substation to the regulated place after keeping a part for backfill of excavated pits and foundation later on. Water must be pumped to dry the bottom surface of excavated pits. The foundations with the depth ≥ 1,5m must be combined with Larsen piles to avoid collapse. The proposed excavation and backfill methods are stated in Table 3.

Table 3. Construction method of excavation and backfill works

No.	Items	Excavation (%)		Backfill (%)	
		Machinery	Manually	Machinery	Vibrator
1	Foundation of transformer	-	100	-	100
2	Foundation of auto-transformer	-	100	-	100
3	Foundation of gate pole and busbar	100	-	-	100
4	Foundation of circuit breaker and disconnector	100	-	-	100
5	Cable trench/troughing	100	-	-	100
6	Road works	-	100	-	-
7	Control room	100	-		100
8	Manhole	-	100	-	100
9	Oil collecting pit	-	100	-	100
10	Wall, gate and fence of substation	-	100	-	100
11	Oil tank	100	-	-	100
12	Emergency oil discharge system	-	100	-	100
13	Floor of substation	100	-	100	-

28. Concrete and reinforcement

- Handling and installation of reinforcement: construction steel will be purchased from selling agents of construction materials in the area of Ho Chi Minh City and then transported to the site according to the schedule. Steel will be bended and installed for reinforcement on site. Before installing reinforcement, it must check the level of foundation bottom, cement lining and the size of excavation pit. The quantity, cleanliness, diameter and type will be checked carefully. The installation must follow the design drawings. The manual installation is applied.
- Foundation concreting: Follow the code of construction and acceptance, TCVN-4453-95. All concrete structures in the substation are cast in-situ concrete, the concrete mixture is implemented by machine and hand. The maintenance must follow TCVN in concrete work, water for mixture must be clean to ensure specification in concrete mixture, concrete test samples must be taken from each structural component.

29. Installation and erection of steel structure: Steel towers installed and erected must met as drawings. Steel towers can be erected in each section on ground and hoisted to install into their positions or erected with each steel bar as the alternative of the construction contractor. Other down guys and equipment used to pull structural components, tower sections or the whole tower must be maintained not to be cut because of being stuck in angles of structural components and damages in structural components or structural components bearing residual stress when pulling. Structural components, tower sections or the whole tower will be hoisted how they are not dragged on ground or hit on the erected tower parts. Contact surfaces of structural components, joint plates must be cleaned before structural components are installed.

30. Installation of equipment: this work is carried out after the construction work has been completed and it will be carried out in succession from far to near, from low to high. Especially the stretching, the connection in the substation is carried out from high to low. Installation of electrical panel will be implemented indoors and outdoors at the same time. Before installing equipment, accessories must be checked in quantity, type, storage quality, transportation as well as technical specification. During the process of checking, if there is any suspicion, it must immediately report to the competent authority to request for settlement. All structural components and equipment moved out of the site must be stored at a dry place, chocked firmly. Erection must be implemented by machines and hand. Installation must follow the design and ensure safety for people and equipment.

3. Demand and Supply Source of Raw Materials

31. The supply source of materials and equipment for the subproject consists of two categories: local/domestic and abroad supply source as follows:

- Electrical equipment, cable wire and accessories have not domestically manufactured, so the Employer shall prepare bidding document and organize bidding to select a foreign supplier. The equipment and fittings will be imported to Saigon port, are stored in the HCMCPMB's storage at Vinh Loc industrial zone and will be transported to the site as the implementation schedule. The electrical equipment, fittings and materials will be supplied through contracts signed between Employer and Suppliers who has awarded contract for supply of equipment and materials in bidding phase.
- Sand will be purchased from selling agents of construction materials in the area of Bien Hoa City and Dong Nai and gravel, cement, brick, woods etc. will be purchased from selling agents in the area of Ho Chi Minh City. These agents must be in legal operation and have an environmental business license.
- Galvanized steel and bolts are taken from processing factory in Ho Chi Minh City or Ba Ria Vung Tau province and then they will be transported to the construction site. The processing factory, that has a business license, is suitable for the subproject, and can offer a reasonable price and the lowest contract value, will be chosen by the construction contractor in the bidding phase.

4. Waste Treatment

32. *Domestic waste*: Number of construction workers at the site is 80 people. The volume of domestic waste at the shelter of the construction contractor is around 9.6 m^3/day. While the number of local workers accounted for 30% of total construction workers, so the volume of domestic water is actually less than the calculating output. To minimize pollution at the shelter area of the substation, it needs to arrange and install mobile toilet to collect domestic waste. In addition, it must provide a water tap, sanitary ware and washing apparatus and have a clean water source near to the mobile toilet to use after completing by the worker at site. Within 2 months, when the volume of septic sludge is full, the construction contractor will hire a sludge dredging company or local Urban Environment Service Unit to dredge and dispose it for treatment.

33. *Construction wastewater* is mainly originated from runoff water from construction site, water pumped from the cable ditches and equipment foundation pits, abundant water from concrete maintenance. Wastewater is mainly at the site of the substation. To minimize effects of the construction process to environment, HCMCPMB will request the contractors to apply the preliminary sedimentation measure before discharging waste water into receiving sources. Receiving sources of wastewater at the site of the substation is the existing sewerage system, which is the underground drain running along street D 1 and connecting to the main drain along Nguyen Huu Canh street.

34. *Domestic solid waste* generated by workers (about 48 kg/day), during the construction period of the substation is mainly food waste, packing materials etc. with nontoxic components. They will be stored in dust bins, then it is transported and disposed at the local stipulated disposal Site.

35. *Construction solid waste* generated during the construction period of the substation are mainly debris, broken concrete, damaged wire and electrical equipment, broken steel, cement packing etc. It will be collected daily. The waste which can be reused, will be collected separately to use for other purpose. The waste which cannot be reused, will be collected and transported to the treatment site.

36. *Excavated soil* is estimated about 6,414.7 m^3. This excavated soil will be used to backfill the foundation pits, cable trenches and ground restoration. Quantity of reused soil of the subproject is about 2,077.7 m^3. The quantity of remaining excavated soil will be collected by civil contractor, who will be responsible for signing a contract with specialized unit to collect and transport to the permitted disposal sites and treated according to regulations at Decision No. 44/2015/QĐ-UBND dated 9 September 2015 of Ho Chi Minh City People's Committee Promulgating regulations on management of sludge in Ho Chi Minh City.

Construction waste will be treated as the following diagram (***Figure** 3*).

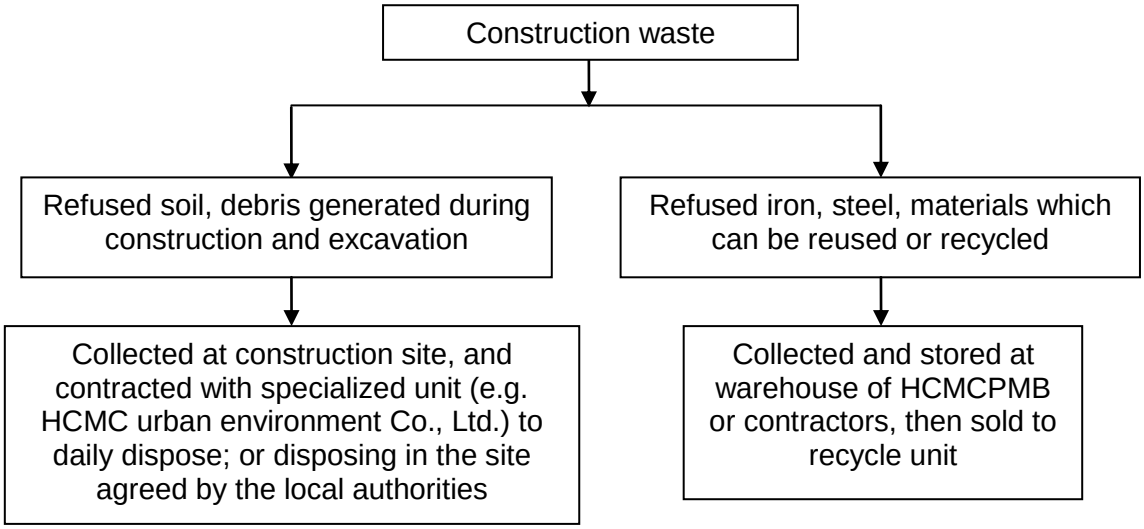

Figure 3. Management of construction waste

5. Implementation Schedule

37. Based on the power development plan of Ho Chi Minh city, the load demand, and the subproject plan, the implementation schedule of the Tan Cang 220kV substation is expected as follows:

- The preparation phase:
  + Completion and approval of investment project: December 2016
  + Preparation of technical design document: January 2017
  + Appraisal, Completion and Approval of technical design: January - May 2017
  + Submitting bidding plan and bidding document to ADB for approval: April –May 2017
  + Organization of bidding for the civil and installation package: June – July 2017
  + Organization of bidding for supply of goods package: June - July 2017
  + Supplying materials and equipment: August, 2017 to March 2018
- The construction phase:
  + Constructing items of the subproject: July 2017 to July 2018
  + Constructing and installing equipment: July 2018 to November 2018
  + Acceptance and start of operation: December 2018.

V. DESCRIPTION OF THE ENVIRONMENT

38. Environmental basic information was mainly obtained from Statistical Yearbooks of Ho Chi Minh City, Environmental Protection Plan[1] report prepared by PECC2 and approved by People's Committee of Binh Thanh district at Document No.93/GXN-UBND-TNMT on 7 March 2016. The affected environmental descriptions focus on natural characteristics and the current land use.

A. Physical Environment

39. The physical environment will be taken source from statistical data (2014) in Ho Chi Minh City, which is issued by Ho Chi Minh City Statistical Office. Data will be considered on temperature, sunlight hours, humidity and rainfall, wind velocity in Ho Chi Minh area. These criteria will be measured and analyzed at Tan Son Hoa station as described in the Ho Chi Minh Statistical Yearbook. The Tan Son Hoa station is one of the meteorological stations in the Southern. This is also one of three high photometric stations of the nationwide. And Statistical Office in Ho Chi Minh City has chosen this station to take samples on physical environment in region of Ho Chi Minh City. Its location is in 236B Le Van Sy street, ward 1 of Tan Binh district in Ho Chi Minh City and is 6.4km far from the subproject.

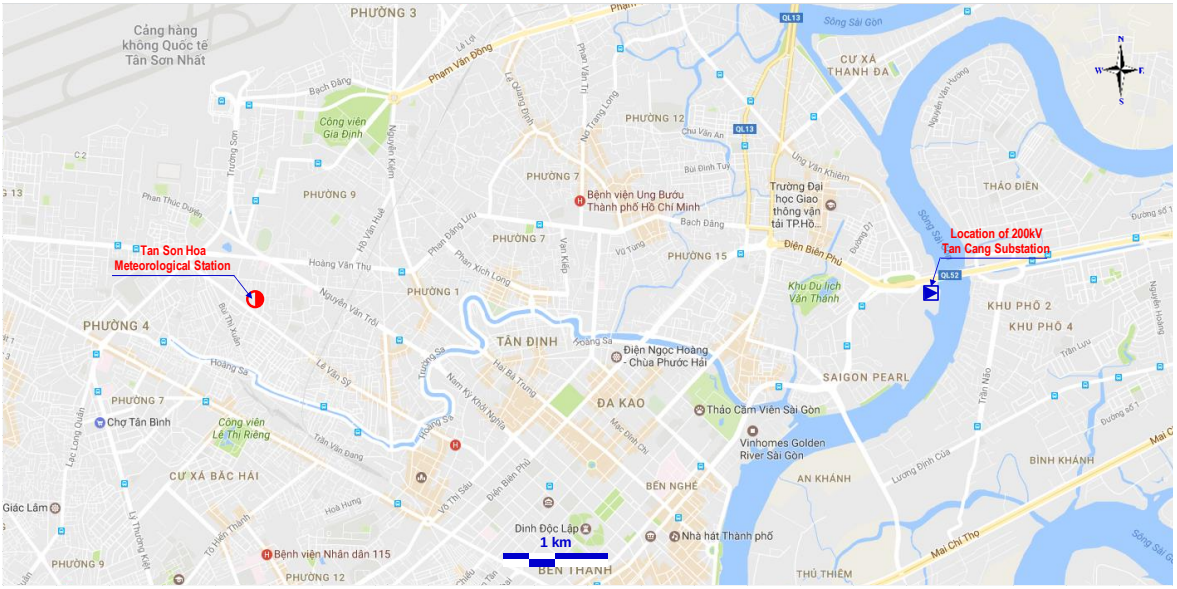

Figure 4. *Location map of Tan Son Hoa Meteorological Station and Subproject*

1. Climate

40. The project areas is situated in the Southern climate zone which is typified by a tropical monsoon climate characterized by high temperatures with very little seasonal variation, summarized as follows:

a. Temperature

41. Air temperature is high and it changes little in year-round. Average annual temperature is 28.4^{o}C. Minimum monthly temperature is 26^{o}C, and maximum monthly temperature is 30,5^{o}C (Table 4).

Table 4 Temperature features at Tan Son Hoa Station

Unit: ^{0}C

[1] Environment Protection Plan (EPP) is stipulated in Chapter V (Article 18 and 19) of Decree No.18/2015/ND-CP dated on 14 February 2015. According to this Decree, an EPP must be established by owner and submitted it to People's Committee of Binh Thanh district for approval in the feasibility stage of the subproject. The content of EPP is detailed in the Appendix 5.6 of Circular No.27/2015/TT-BTNMT dated 29 May 2015.

Year / Month	2010	2011	2012	2013	2014
Annual Average	***28.6***	***28.1***	***28.6***	***28.4***	***28.4***
January	27.3	26.9	27.6	27.3	26.0
February	28.4	27.6	28.2	29.0	26.9
March	29.4	28.3	29.5	29.3	29.1
April	30.3	29.1	29.3	30.4	30.2
May	31.3	29.5	29.2	29.8	30.5
June	29.3	28.5	28.7	28.9	28.7
July	28.3	27.9	28.3	28.1	28.0
August	27.9	28.4	29.1	28.3	28.4
September	28.6	28.1	27.5	27.6	28.3
October	27.5	28.1	28.2	27.7	28.1
November	27.2	28.1	28.8	28.1	28.8
December	27.4	27.2	29.1	26.6	27.9

(Source: Statistical Yearbook of Ho Chi Minh city, 2014)

42. According to the report of the Working Group on Climate Change and Development, (2007), in the Mekong region (Ho Chi Minh City) average temperature in the last century has risen 0.3 - 0.8°C. Further temperature increase is expected along with more extreme weather events, such as floods and droughts, change in the amount and distribution of rainfall, disruption of seasonal monsoons, and rising sea level.

b. Sunlight Hours

43. The average number of sunlight hours in Ho Chi Minh City is rather high as compared with many other provinces in the country. The Table 5 shows that the number of sunlight hours observed in Tan Son Hoa meteorological station.

Table 5. Average number of sunlight hours at Tan Son Hoa station

Unit: hours

Year / Month	2010	2011	2012	2013	2014
Annual Average	***2,073.7***	***1,892.9***	***2,131.6***	***2,023.4***	***2,238.2***
January	157.1	120.1	141.1	161.8	178.3
February	245.3	188.9	176.8	192.6	216.3
March	239.6	157.8	208.6	243.7	274.7
April	240.8	187	217.3	186.8	187.3
May	210.4	165	198.2	192.9	195.8
June	177.0	163.6	164.3	147.8	152.7
July	150.0	162.6	182.1	150.8	155.7
August	141.2	198.1	218.9	185.9	183.0
September	155.2	144.8	118.7	110.7	174.3
October	102.7	154.3	154.1	156.6	169.8

Year / Month	2010	2011	2012	2013	2014
November	130.6	141.0	164.9	172.3	184.0
December	123.8	109.7	186.6	121.5	166.3

(Source: Statistical Yearbook of Ho Chi Minh city, 2014)

c. Humidity and Rainfall

44. Annual average humidity is around 78% - 82%. Rainy regime is divided into the two seasons; rainy season lasts from May to October and dry season lasts from November to the next year's April. Maximum daily rainfall in the area is 200mm/day. Total annual average rainfall in the area is from 1800 mm to 2000 mm (see Table 6).

Table 6. Monthly and annual average rainfall and humidity at Tan Son Hoa Station

Unit: mm

Year / Month	2010	2011	2012	2013	2014
Annual Average	***2,016.2***	***1,953.8***	***1,883.0***	***1,980.5***	***2,042.2***
January	23	9.4	18	38.1	2.5
February	-	-	68.7	0.1	22.1
March	3.9	40.3	36.4	10.1	-
April	9.9	181.9	144.4	18.3	111.5
May	8.8	124.4	72.2	196.8	179.7
June	160	213.1	270.6	173.3	258.0
July	294.3	281.5	200.4	175.8	234.2
August	400.6	244.4	113.4	260.7	353.4
September	373.7	232.1	407.9	411.2	342.1
October	321.8	232.6	434.4	407.4	306.5
November	379.9	321.1	91.2	257.4	182.2
December	40.3	73.0	25.4	31.3	50.0

(Source: Statistical Yearbook of Ho Chi Minh city in 2014).

d. Wind Velocity

45. From November to April, wind is mainly from the northeast and dry while from May to October wind is mainly from the southwest and brings heavy rainfall to the low-lying plains and the eastern slope of Truong Son Mountain Range. Annual average wind speed recorded at Tan Son Hoa station is 2.8 m/s. Thunderstorm is mainly in rainy season from May to October, number of thunderstorm days are presented in Table 7.

Table 7. Wind velocity and number of thunderstorm days at Tan Son Hoa Station

Parameter	Month, year												
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year (average)
Wind speed (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
Number of thunderstorm days	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

(Source: Data of Tan Son Hoa Station is referred to National Technical Regulation on Climatic data for construction).

2. Ambient Air Quality and noise

46. Air quality in the subproject area was measured and analyzed in May 2017. Ambient air quality around region of 220kV Tan Cang substation is evaluated by measuring and sampling method. During the evaluation period, the subproject's owner and consulting unit (Technology and Environment Service Research Center - ETC) was cooperated, measured, sampled and analyzed the air quality (including dust, contents of CO, NO_2, Pb, SO_2 etc.) and noise at three locations, coded as K1, K2 and K3. The results of air quality analysis are presented in Table 8. Locations of K1, K2 and K3 are shown on the map as attached in ***Figure 5***.

Table 8. Monitoring results of ambient air quality in the subproject area

No.	Parameter/unit	Unit	Monitoring result			Standards
			K1	K2	K3	
1	Temperature	^oC	30.9	31.2	31.5	≤ 32(1)
2	Humidity	%	61.1	60.2	62.5	≤ 80(1)
3	Wind speed	m/s	0.3 – 0.8	0.5 – 1.1	0.4 – 1.0	0.2 – 1.5(1)
4	Sunlight	lux	ASTN	ASTN	ASTN	≤ 200(1)
5	Noise	dBA	62.5 - 68.2	65.2 – **71.8**	64.5 - 68.4	70(2)
6	Dust	mg/m^3	0.23	0.28	0.27	0.3(3)
7	CO	mg/m^3	5.2	6.6	4.7	30(3)
8	NO_2	mg/m^3	0.11	0.15	0.14	0.2(3)
9	SO_2	mg/m^3	0.15	0.12	0.18	0.35(3)
10	Pb	mg/m^3	KPH	KPH	KPH	-
11	Hydrocacbon (CnHm)	mg/m^3	0.502	1.104	0.446	5(4)

(Source: Technology and Environment Service Research Center - ETC, May 2017).

Notes:
The evaluated values are based on the following Decision and Standards:
(1) Decision No.3733/QD-BYT on 10/10/2002 of the Ministry of Health promulgating 21 labor hygiene standards, 5 principles and 7 labor hygiene measurements;
(2) QCVN 26:2010/BTNMT - National technical regulation on noise (normal area from 6 a.m to 9 p.m);
(3) QCVN 05:2013/BTNMT - National technical regulation on ambient air quality.
(4) QCVN 06:2009/BTNMT: National technical regulation on hazardous substances in ambient air;
ASTN: Natural sunlight;
KPH: Not found.
KK1: at the road D1, access road of Vinhomes Central Park (X: 688466.3, Y: 1194092.6).
KK2: at the proposed location of substation (X: 688642.3, Y: 1194148.8).
KK3: at the nearest residential area (X: 688405.7, Y: 1194323.5).

47. According to the above results shown that air quality in the subproject area is relatively good. Most of analyzed parameters met the allowable limits on environmental quality under the QCVN 05:2013/BTNMT; QCVN 06:2010/BTNMT and QCVN 26:2010/BTNMT.

48. Pollutant is dust which is also a serious concern in the monitoring process. The measured values at the above three locations met the allowable limit in the QCVN 05:2013/BTNMT,

49. NO_2 content was 0.11 mg/m^3, 0.15 mg/m^3, 0.14 mg/m^3 at K1, K2 and K3, respectively. CO content was 5.2 mg/m^3, 6.6 mg/m^3, 4.7 mg/m^3, SO_2 content was 0.15 mg/m^3, 0.12 mg/m^3, 0.18 mg/m^3. While Pb content was found at sampling period.

50. The measured results of noise at the above locations are (i) K1: 62.5 – 68.2 dBA; (ii) K2: 65.2 – 71.8 dBA; and (iii) K3: 64.5 – 68.4 dBA. According to the results, value at K2

exceeded the allowable limits under the regulation of QCVN 26:2010/BTNMT Because sampling location is near to Sai Gon Bridge; this is a main traffic axis for in-coming and out-going of the city and period of taking the sample was be in the rush hour traffic. However, the exceeded value was only 1.8 dBA under the stipulations so it will be evaluated as a minor impact.

3. Topography, Geology and Soil

51. According to the survey report of "220kV Tan Cang substation" subproject in feasibility study phase, topographical surface in the proposed subproject area is relatively flat.

52. According to structural morphologic features, geomorphology of the subproject area has typical features of riverine delta.

53. During feasibility study, the design unit investigated and drilled geology at the subproject's region, and the result shows that geological feature is concrete, broken-stone, bitumen and loose sand with the depth from 2.5-3.0m and is sedimentary formations mixed with the Holocene age (abQ_{IV}) swampy river, the lower part is the river sediments with the age of middle-upper Pleixtoxen (aQ_{II-III}) with the depth from 3-20m.

54. Based on the survey results in the field and test result in the laboratory of soil physico-mechnical properties and archived geological materials structure with the depth of 50m, the layer is described as follows:

- Layer 1 (tQ_{IV}): backfill soil layer, composition consists of broken-stone (2x4), concrete, bitumen with blue-grey and back-grey with the depth of 0.5-1m. Lower layer is sandy, yellowish clayed sand, poor compaction; the depth is about 2m.
- Layer 2 (abQ_{IV}): is black-grey clay mud, strain and mixed vegetable soil. Layer 2 is distributed in two drilling holes, the thickness ranges from 19.7m to 20.4m at strain status. At the bottom of this layer is light sandy and poor compaction.
- Layer 3 (aQ_{II-III}): is clayed sand, fine-grained sandy with ashy grey, yellowish grey, medium compaction. Layer is distributed into two drilling holes. The thickness of this layer ranges from 6.2-8m.
- Layer 4 (aQ_{II-III}): clayed sand, black-grey clay, ashy grey, rigid plastic, mixed with fine-grained sandy, medium compaction. Layer 4 is distributed in two drilling holes with the depth of 8.8m.
- Layer 5 (aQ_{II-III}): clayed sand, yellowish brown sandy, closed compaction. Layer 5 is distributed in two drilled holes. The depth of layer is 11.6m.

Mechanical indicators of soil in subproject area is presented in Table 9

Table 9. Mechanical indicators of soil in subproject area

Layer / Mechanical properties of soil	*Layer 2 Clay mud*	*Layer 3 Clayed sand, sand*	*Layer 4 Clay, clay loam*	*Layer 5 Clayed sand, sand*
Natural humidity (W%)	70.8	18.6	28.4	19.1
Natural density γ_w (g/cm^3)	1.54	2.02	1.90	2.02
Dry density γ_K (g/cm^3)	0.91	1.71	1.48	1.69
Density Δ (g/cm^3)	2.65	2.66	2.67	2.67
Pore grade n%	65.8	35.9	44.4	36.5
Pore coefficient ε_o	1.948	0.561	0.819	0.576
Saturated degree G%	96.2	88.1	91.8	88.7
Consistency B	+1.60	+0.11	+0.38	+0.15
Compressibility coefficient a_{1-2} (cm^2/kG)	0.149	0.015	0.031	0.015

Layer / Mechanical properties of soil	*Layer 2 Clay mud*	*Layer 3 Clayed sand, sand*	*Layer 4 Clay, clay loam*	*Layer 5 Clayed sand, sand*
Angle of interior friction φ_o	$03^0 30'$	$29^0 09'$	$16^0 28'$	$28^0 29'$
Cohesion C (kG/cm^2)	0.057	0.071	0.187	0.077
Compress indicator C_c	0.416	0.032	0.019	0.029
Compaction coefficient Cv (1-2) (cm^2/s)	2.53E-04	4.78E-04	4.25E-04	4.45E-04
Penetration index K 20^0c (cm/s)	$2.1x10^{-5}$	$3.6x10^{-2}$	$2.3x10^{-3}$	$4.7x10^{-2}$
Modulus of deformation E_0 (kG/cm^2)	8	77	43	77
Standard load pressure R_0 (kG/cm^2)	0.4	1.7	1.4	1.7

(Source: Southern General Investigation Enterprise – PECC2)

4. Surface Water/Ground Water Resource

55. Ho Chi Minh City has a diverse river system. Dong Nai River discharges about 20 - 500 m³/s, supplying 15 billion m^3 water. This supplies main source of fresh water for the city. In addition, Saigon river has 80 km in length running through the city with discharge of 54 m³/s. The width of the river section running through Ho Chi Minh City is in the range of 225-370 m at the depth of 20 m. Dong Nai and Saigon rivers are connected inside the city by Rach Chiec canal system. Another river in Ho Chi Minh City is Nha Be river where is the confluence of Dong Nai and Saigon rivers, discharging into East sea through two estuaries, Soai Rap and Ganh Rai. Except the main rivers, Ho Chi Minh City still has a tangled canal system such as Lang, Bau Nong, Tra, Ben Cat, An Ha, Tham Luong, Cau Bong, Nhieu Loc – Thi Nghe etc.

56. Location of 220kV Tan Cang substation has a plain topography. It is situated in riverside of Saigon river. The flow regime of the river is affected by tide of East sea and source flood of Dong Nai river. The subproject is maybe flooded when torrential rain is together with flood-tide.

57. From the calculating results, it realizes that in 2013 at Phu An hydrographic station, the water level reaches to the highest crest of tide in history H = 1.68m (similar with frequency of 2%), at the same time at the project, due to heavey rain and water not discharged in time, it causes local flood with the flood level Hmax = 1.85m. The designed water level for 220kV Tan Cang substation is H_{design} = 1.85m.

5. Water Quality

58. Water environment in the subproject area is monitored at two positions of surface water sampling (at position of the upstream – NM1 and downstream – NM2 of the port). The result is presented in Table 10. Locations of NM1 and NM2 are shown on the map as attached in ***Figure 5***.

Table 10. Monitoring results of surface water quality in the subproject area

No.	Parameter/unit	Unit	Results		QCVN 08:2008/BTNMT (Column B1)
			NM1	NM2	
1	Turbidity	NTU	31	34	-
2	DO	mg/l	4.2	4.5	≥4
3	BOD_5	mg/l	13	14	15
4	COD	mg/l	22	25	30
5	Nitrate (NO_3^-)	mg/l	1.18	0.76	10
6	Phosphate (PO_4^{3-})	mg/l	0.19	0.24	0.3
7	Oil, grease	mg/l	0.06	0.08	0.1

No.	Parameter/unit	Unit	Results		QCVN 08:2008/BTNMT (Column B1)
			NM1	NM2	
8	Coliform	MPN/ 100ml	4.500	3.200	7.500

(Source: Technology and Environment Service Research Center - ETCMay, 2017)

Notes: QCVN 08:2008 BTNMT: National technical regulation on surface water quality (Column B1: used for irrigation purposes, water transport and other other purposes with the requirements of low quality water).

With the above result, the quality of surface water at the monitoring locations have not been polluted; almost pollution criteria at the time of observation satisfy the permissible maximum value stipulated in QCVN 08/2008/BTNMT for water source used for the purpose for irrigation and other use purposes requiring the similar water quantity.

Figure 5. *Map of sampling locations*

B. Biological Environment

1. Vegetation Cover and Land Use

59. 220kV Tan Cang substation is situated in Tan Cang Complex Area, the former construction site is a cargo port, therefore the system of vegetation and animals almost does not exist . The area is used for construction of the substation consists of 2 parts:

- The part in infrastructure planning of Tan Cang having the landmarks ABHFG is 2,229m^2.
- The part in the buffer zone of Saigon river having the landmarks BCDEFH is 699m^2. This area is only used for transportation roads in the substation and fences.

2. Wildlife

60. Based on actual situation and observation, it can be concluded that no endangered wildlife occurs any longer within the area. There are no animals that could interfere with or have impact on the subproject area.

3. Conservation Areas

61. There are no conservation areas within or near the subproject site according to the list of natural parks and conservation areas of Viet Nam stipulated by Ministry of Agriculture and Rural Development.

C. Social-Economic Conditions of the Communes in the Subproject

1. Population

62. 220kV Tan Cang substation is located in ward 22, Binh Thanh district, Ho Chi Minh city. The population feature of the ward is described in Table 11.

Table 11. Population and labour in the subproject ward

No.	Ward	Total population (person)	Population in working age (person)	Rate of population in working age (%)
1	22	32,280	22,903	70.95

(Source: Statistical Yearbook of Ho Chi Minh City in 2014).

63. The subproject is located in the city so the population density within the ward is high. No ethnic minority group lives in the subproject area; all local people are Kinh people at the ward 22 of Binh Thanh district.

2. Local Economy

64. Economy of Binh Thanh district continues to have a tendency to develop in the right direction on service – trade-production with the high growth rate. District strengthens the management of tax declaration and continues to implement the use of business management and business households in the district and it also strengths to minimize the spontaneous business points in district.

65. Economy of ward 22, Binh Thanh district always maintains and promotes the implementation of the campaign “Vietnamese people use Vietnamese goods”. The ward strengthens the inspection and review of the operated individual business households and enterprises in the locality. Now, 490 households stopped business and 83 households are registered for new business. In ward, there are 245 enterprises and 1,048 private business households (including rental rooms) in operation up to now. There are 213 poor households and 105 near-poor households.

66. As of early 2016, revenue of ward 22 reaches 12.30 billion per 7.97 billion Vietnamese Dong (obtained 154.32% in comparison with the plan); budget expenditure reached 11.18 billion per 7.97 billion Vietnamese Dong (obtained 148.43% in comparison with the plan).

3. Social Infrastructure

a. Public Health and Environmental Sanitation

67. The subproject ward 22 of Binh Thanh district has 01 medical station with 4 medical staffs (two doctors and 2 nurses) and 2 sickbeds. Activities for taking care the local people’s health over the past years have been paid a great attention.

68. The propaganda is regularly maintained as follows:

- Organizing 216 communication sessions, broadcasting for prevention of some diseases such as Dengue, Measles, Hand food and mouth, Rubella, etc.;
- Organizing the launching ceremony for the action month for Food safety, hygience quality for the ward’s business establishments;
- Implementing initial health care for 6,480 people (reaching the ratio of 107.2%), in which 970 children;
- Carrying out injection of 8 types of vaccine, gaining 100%. The ratio of malnutrition in children is 0.5%;
- Continuosly communicating the program of population – family planning such as fertility reduction, fertility reduction in the third children; productive health care.

- Organizing a total sanitary to respond to green Sundays and public holidays, collecting and burning down 3.75 tons of waste;
- Mobilizing people to join the week collecting hazardous waste, 20 kgs of bulbs and 5 kgs of batteries have been collected; and
- Coordinating with DONRE to propagandize prevention in weather change with 93 participants.

69. All residents in the ward have access to the tap water supplied by the local water supply company. Water quality is good but has to be boiled for cooking and drinking purposes, especially for younger children and older adults.

70. All local people of the subproject are connected to the national electricity grid.

b. Education

71. The ward was organized activities for the day "take all children to school" and completed the enrolment task for 2015 – 2016 school year: the ratio of children at school age is 100%; the number of 5 years – old children joining nursery school is 254/257, gaining 98.98%; the number of children studying class 6 is 253/253, gaining 100%.

72. The ward coordinated with the continuing education centers of the district to universalize education of learning level, in which:

- Universalization for primary school at the right age is 215/257 children, gaining 95.98%.
- Children graduated from primary school for class 6 was 220/220, gaining 100%.
- Children from 15 to 18 years old graduating secondary school was 895/951, gaining 94.11%.
- Graduation from high school – day-boarder high school was 252/253, gaining 99.60%.

4. Transportation and Communication

73. Traffic road: all inter roads are asphalted and the others are cemented so it is convenient for local people to travel and get access easily to the ward and other surrounding areas. The traffic network is advantageous to develop a comprehensive economy, exchange domestic and international trade in the fields of business production and exchange of goods.

74. For the traffic networks connecting to the subproject area, majority of traffic routes connecting to the subproject site are main roads such as Ha Noi highway, Dien Bien Phu street and Nguyen Huu Canh street which are asphalt paved roads with heavy load. The roads leading to the subproject site from main road include road D1 and road D11 that are the newly built roads with high quality for internal traffic in Tan Cang Sai Gon Urban Complex.

75. Communication is good; all households in the ward have television, telephone and connect the internet. The subproject area is covered by post stations, many telephone networks as Viettel, Mobifone and VNPT telecommunications, and as number of other telecommunications companies are available. Internet services are very common and convenient in the area.

5. Culture and Heritage

76. PECC2 has surveyed the sensitive infrastructures surrounding the construction location of 220kV Tan Cang substation and the result shown in Table 12.

Table 12 Sensitive infrastructures surrounding the construction location

No.	Name of Infrastructures	Location	Distance from the subproject
1	Cuu Long Secondary School	Ward 22, Binh Thanh district	1,400m
2	Ho Chi Minh City University of Technology	Ward 25 of Binh Thanh district	1,210m

No.	Name of Infrastructures	Location	Distance from the subproject
3	Binh An Secondary School	Binh An ward of district 2	1,000m
4	Nguyen Hien Primary School	An Phu ward of district 2	1,300m
5	Ho Chi Minh City Culture University	Thao Dien ward of district 2	1,000m
6	Kidzone Kindergarten	Thao Dien ward of district 3	900m
7	Minh Hoa Pagoda	Ward 22, Binh Thanh district	530m
8	Vinmec International Hospital	Ward 22, Binh Thanh district	600m
9	Medical service unit of ward 22	Ward 22, Binh Thanh district	1,380m

77. The above sensitive infrastructures are quitely far from the subproject's area so impacts on these areas is limited.

6. UXO Clearance

78. After many decades of war, bombs, mines and explosives are still an important issue in Vietnam. The subproject is located in a region where many fighting happened in the past and particularly, there are many military posts and guardrooms in the war. So at the Document No. 2462/BLT-PTM on 7 December 2015 of Ho Chi Minh City High Command has required the subproject's owner to clean and move all bombs, mines and explosives before constructing the subproject. Area of UXO clearance is estimated 4,165m^2.

7. Subproject Affected People

79. The subproject location is chosen to minimize losses of both the assets and land of local people and create beauty in the city. The subproject is expected to be constructed in the second infrastructure planned region of Tan Cang Complex Area in ward 22, Binh Thanh district, Ho Chi Minh City. This area was the yard of Tan Cang port used by Tan Cang Sai Gon Corporation under the management of MoD. There are no houses and structures in the location. This is a vacant land and it was completed the infrastructure plan and delivered to the subproject's owner. Clearance of the site is currently being completed. The site of subproject is shown in ***Figure 6***.

Figure 6. The current status of the subproject's site

8. Land Acquisition

a) Permanent land acquisition

80. Total land area acquired permanently to construct the substation is 2,928m^2, in which 2,229m^2 is managed by MoD in Tan Cang - Sai Gon region; this land is an empty yard used by Tan Cang – Sai Gon Corporation and 699m^2 is in the planned area for protective corridor of Sai Gon river; this is a public vacant land within the Tan Cang Complex Area and managed by the local authority. According to the letter of MoD, land area of 2,229 m^2 was delivered to EVNHCMC for construction of the subproject. The subproject's owner will bear responsible for permission of land use right before constructing the substation. And land area of 996m^2 in the protective corridor region of Sai Gon River will be used to construct the domestic traffic roads and fences within and surrounding the substation.

81. The subproject is required to build a new access road for construction and operation of the substation as well. The access road will be 23m in length and 6m in width with total area of 281m^2. It will start at gate of substation and connect into D11 street; this area was located in a part land of the greenery area of 21 m in width and the D11 street will be a domestic road of Vinhomes Apartment; this street was owned by the Vingroup Corporation and built for the travelling purpose of all households lived in Vinhomes Apartment. The subproject's owner will use these land areas as the access road under the agreement and commitment between parties (including the subproject's owner, Vingroup Corporation and relevant authority). The details of land acquisition and use are summarized in the Table 13.

Table 13 The summary of permanent land acquisition

No.	***Subproject components***	***Land Area (m^2)***	***The Current land use***	***Purpose of acquisition***
1	Substation	2,229	Area is located in the planned region of Sai Gon – Tan Cang Complex Area, which was owned by the EVNHCMC under the letter of Ministry of Defense.	Permanent acquisition for construction of a substation
		699	Area is located in the corridor of Sai Gon River; this was a public land and managed by the State/local authority.	Permanent acquisition for construction of a domestic traffic road and a fence of the substation.
2	Acccess road	281	Area is located in land region and owned by Vingroup Corporation. This Corporation has committed and unified with the subproject's owner to use as an access road.	Common use with the current land area of Vinhomes Apartment.

82. The whole area for construction of the subproject was managed by the State and local authority so the subproject's owner will not execute compensation but they shall bear responsible for procedures to transfer the land use right in accordance with the current regulations.

83. The access road will use a part of greenery land area of Vinhomes Apartment and the current D11 street; this is a domestic road entering the Vinhomes Apartment and

owned by the Vingroup Corporation. The land use of Vingroup Corporation as the access road is carried out under the agreement between parties so the subproject's owner will not execute compensation.

b) Temporary land acquisition

84. The subproject does not require land acquisition; all storages of equipment and materials, disposal sites/stockpiles, safety corridor of the subproject and camp for workers during construction period will be arranged within area of substation by the construction contractor.

VI. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

85. Assessment of environmental impacts of the subproject is structured by the three development phases of the subproject defined by: pre-construction, construction, operational phase. In this way potential impacts of common activities of the three phases can be addressed together thereby minimizing redundant assessments. Specific potential impacts to the subproject components will be discussed separately. This structure is used to establish the environmental management plan (EMP) in Section X.

A. Subproject's Benefits

86. The highest benefit of the subproject is to meet the increasing power demand in Ho Chi Minh city, especially in the areas expected to become luxurious urban complexes (zones of Tan Cang and Ba Son). In addition, the subproject will help reduce power losses and improve quality, safety and reliability in power supply.

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

1. Land acquisition and compensation

87. According to the selected location alternative, the proposed 220kV Tan Cang substation (2,928 m^2) is located on the western riverside of Sai Gon River about 33m from Sai Gon bridge. In which, 2,229 m^2 is in the second infrastructure planned region of Tan Cang Complex Area, which is used by the Tan Cang – Sai Gon Corporation under the management of the MoD and 996 m^2 is in the protective corridor region of Sai Gon river. This area was be legally assigned to Ho Chi Minh City Power Corporation (EVNHCMC) under the Letter No.4394/BQP/TM dated June 7th, 2014 of MoD to build the subproject. In addition, an access road will be constructed with area of 281 m^2 to use during the construction process and further substation's operation. This area is in greenery land of Vinhomes Apartment and the current D11 street, which is owned by the Vingroup Corporation. The subproject's owner will be permitted use as the access road under the agreement between Vingroup Corporation, the owner and local authority so the subproject's owner will not execute compensation.

88. The whole area for construction of the subproject components is public land under the management of People's Committee of Ho Chi Minh City and Tan Can Sai Gon Corporation. This area will be assigned to EVNHCMC in compliance with regulations of law and in the agreement of MoD about assignment of their land use right. The land use at the area of subproject is composed of no longer used yards of Tan Cang Sai Gon Corporation and corridor of river and traffic under the management of the State. There is no private house and land in this area, so no household will lost their land or be affected by land acquisition of the subproject.

89. For activities of Tan Cang port in the area of the proposed substation, according to the planning of land use in the area and the agreement about assignment of their land use right of MoD, the relocation plan of Tan Cang port has been prepared by Tan Cang Sai Gon Corporation and its displacement is completed. Therefore, the change of land use purpose and clearance of the substation will not result in significant impacts. Currently, it is no longer used as yards in this area, so the clearance of subproject will not cause a lot of damage from dismantlement of existing structures. The dismantlement and displacement of these structures will be conducted by Tan Cang Sai Gon Corporation as their plan prior to land transfer to EVNHCMC.

2. UXO Clearance

90. Impacts: In the subproject area, UXO may still exist, thus if not implement UXO clearance, it may cause risks of worker's and people's life when conducting the subproject construction. Therefore, the removal of bombs, mines and explosive remained after wars at site of 220kV Tan Cang substation is necessity; the subproject's owner will contact

functional units or Ho Chi Minh City High Command which are the organizations licensed by the MoD to detect and clear them. The UXO clearance will be done according to the Document No. 2462/BLT-PTM on 07 December 2015 of Ho Chi Minh City High Command before construction.

91. Mitigation measures: UXO clearance procedure: before preparing and clearing site for constructing the project, it is necessary to coordinate with the competent agency for UXO clearance in the proposed subproject area. Area of UXO disarmament is about 4,165 m^2. The proposed guidance for UXO clearance is as follows.

- Execution of UXO detection and removal is done following these steps:
  - + Covering UXO detection and clearance area,
  - + Clearing the grounds
  - + Detection by the detector to a depth of 0.3m
  - + Mark, digging test and resolve signal to a depth of 0.3m
  - + Detect bomb by detector to a depth of 5m (put in step with high sensitivity)
  - + Excavation, checked resolve signal to a depth of 3m
  - + Excavation, checked resolve signal to a depth of 5m

Notes: When detecting UXO, warning boards and guard have to be arranged to avoid accidents due to entrance of people, animals or vehicles.

- Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives in QCVN 02:2008/BCT on National technical regulation on safety in the storage, transportation, use and disposal of industrial explosive materials, and the other current regulations.
- Competent unit shall be responsible to notify The Military Commander of Ho Chi Minh city on the implementation mission: clearance location, construction schedules and staying time in the locality.

C. Potential Impacts and Mitigation Measures during Construction phase

1. Potential Impacts and Mitigation Measures for Construction Activities

92. 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 & vibration

Impact:

93. Noise, vibration, dust and exhausts generated by operation of machines', equipment and transportation vehicles; excavation and backfilling of soil; and transport of materials will impact on ambient air environment. These impacts are short-term and will be stopped when the construction is completed. The details are as follows:

- *Dust generation during transporting and construction materials* is expected with an increase in TSP ground level concentration due to earthworks, contact of machinery with bare soil, and exposure of bare soil and soil piles to wind. The major source of diffuse dust is from soil excavation and backfilling, levelling. However, the levelling at the subproject location has been completed in the construction work of Vinhomes Central Park Residence, so the excavation and levelling soil of the subproject is in small volume. In addition, the humidity of excavation soil in the construction site near the riverside is relatively high, so it could help to minimize dust release from these activities. Moreover, construction activities will be mostly implemented within construction area of the substation relatively isolated from existing residential areas and the earthworks last just two months. Thus, the impacts of diffuse dust are considered to be insignificant.
- *Gas exhausts such as NOx, SO_2, CO* are generated by operation of construction machine and equipment, and transportation vehicle activities. With a scope of

construction as mentioned, the subproject shall mobilize about 15 machines and vehicles to operate at the peak time at site and along the access roads. The mechanical vehicles use the fuel of diesel with 0.05% sulphur content. The concentration of air pollutants in their exhaust gas according to theoretical calculation are 45.9 mg/Nm^3 of dust; 64.7 mg/Nm^3 of SO^2; 622.3 mg/Nm^3 of NO_2; and 141.7 mg/Nm^3 of CO lower than the allowable limits under QCVN 19:2009/BTNMT (column B), so impacts from this activity will be negligible. Dust and exhausts from the mechanical means will affect to ambient air environment in the construction site and along the transport roads (Ha Noi highway, Nguyen Huu Canh road, Road D1 and Road D11).

- *Noise and vibration* are generated by activities of machines, equipment and means such as truck, bulldozer, excavator, concrete mixers etc. According to the calculation results, noise generated by these machines will fluctuate between 72 and 93 dBA at the distance of 1.5m; and this value will reduce lower than the allowable limit (70dB) at the distance of 240m. The subproject is constructed on a vacant land, there is no house in region and adjacent structures are apartments of Vinhomes under the construction. The existing residential area is far (about 260 m) from the subproject area. In addition, the machines, equipment and means will only operate in the day time, to avoid disturbing rest time of local people at night. Thus, noise impact is insignificant and short time. It impacts only on households living along transport roads and near the construction site within the distance of 240m.

94. With the above contents, impact on air quality to the community due to dust, exhaust and noise are insignificant and localized within the substation site.

Mitigation Measures:

95. Best management practices will be applied to minimize impacts coupled with effective environmental monitoring. Measures that can be applied to minimize impacts on ambient air quality are:

i) Stockpile of excavated soil will be covered and kept moist.

ii) All vehicles used for construction, and equipment and machines emitting noise, exhausts need to be maintained properly to minimize emission and that valid operating permits are secured throughout the project schedule.

iii) Operation of vehicles and equipment should be limited at night if possible to minimize noise.

iv) Construction materials such as cement, sand and aggregates will be covered during transit and while stored on-site.

v) Bare soil at the construction sites and along the access roads (road D1 and road D11) will be kept moist by frequently spraying water to minimize dust.

vi) Excavation and filling duration should be reduced, and excavated soil will be used to fill right after complete work.

vii) Soil scattered on the paved road and public road shall be removed immediately

viii) Suitable mufflers will be installed on engine exhausts when appropriate.

ix) Minimizing blowing of horn and complying with speed limits will be required, particularly when going along the sub roads (road D1 and road D11).

b. Water Environment

Impacts.

96. Sources causing impacts on water environment include domestic sewage and construction waste water.

- *Domestic wastewater* is generated by worker's life activities. Number of workers is about 80 people. Thus, domestic wastewater volume generated is about 9.6m^3 per

day. Components of domestic wastewater include residues, SS, organic matters (BOD/COD), nutrient matters (N, P) and micro-organisms. The domestic wastewater generates from the worker camp which will be placed on the construction area of the substation near the water body of Sai Gon river in the distance of 50 m. If the domestic wastewater is not collected and treated properly, it will affect the water quality of Sai Gon river. However, the domestic wastewater is not high in volume and can be collected and treated by movable toilet with septic tank.

- *Construction wastewater* includes mainly runoff water from construction site, water pumped from the cable ditches and equipment foundation pits, abundant water from concrete maintenance. Components of the wastewater are mainly SS originated from soil and sand, thus it can cause increase in the turbidity of surface water sources near the subproject site. The construction site is adjacent to Sai Gon river, so runoff water and construction wastewater are likely to flow directly into the river causing impacts on river water quality. However, this wastewater does not contain hazardous substances to impact on environment. In order to avoid impact on environment due to construction wastewater, the construction unit should do excavation and concrete works in the sunny day and require workers to use water for proper purposes, avoiding wasteful use so the volume of construction wastewater will be small.

- *Refused oil and gearse; duster cloths contaminated with oil, grease; waste water from wash of vehicles and equipment* 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 – MoD 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 from 3 to 6 months depending on the intensity of machines and vehicles. The subproject will use about 15 types of machines and vehicles for construction at site and its construction is 12 months so volume of refused oil and lubricant will be about 210 to 420 litres.

Mitigation Measures:

97. Water environmental impact mitigation measures include:

* *For domestic wastewater*::

- Use of local labour is encouraged if possible to reduce amount of worker staying in worker camp and thus mitigation of domestic wastewater. At the worker camp which will be established on the construction area of substation, mobile toilet with septic tank will be provided for workers to collect domestic wastewater. The septic tank consists of three sections of containing, depositing and filtering for preliminary treatment of domestic wastewater before discharging to the existing sewerage system along street D1. The construction contractor/s will periodically hire competent unit (e.g. HCMC Urban Environment Company Limited) to collect toilet waste in septic tank.

* *For construction wastewater*:

- Schedule excavation activities during dry season or sunny day to reduce volume of runoff water, the dry season in the Ho Chi Minh city is from December to April.

- Arrange collection hole of construction wastewater for deposition of SS before wastewater flows into the existing sewerage system along street D1. The detail for technical specification for the hole depends on factual volume of construction wastewater. The common dimensions can be 4m x 2m x 0.5m (length x width x depth). The hole can be placed at the end of water collection ditches in the construction area and connected to the existing sewerage system of Tan Cang area.

- Dig ditches on the construction site to direct the wastewater flows into sedimentation hole and provide connection from the hole to the existing sewerage system in the area.

- All the reparation and, maintenance of vehicles and equipment should be implemented at garages in the surrounding areas. Refused oil and gearse, wastewater from wash of

vehicles and equipment, duster cloth contaminated with oil, grease will be collected and treated at these garages as stipulated.

c. Soil Environment

Impact:

98. Sources causing impacts on soil environment include impacts due to domestic and construction solid wastes, and impacts due to excavation and ground leveling causing soil erosion.

- *Impacts due to domestic solid wastes created by workers' daily-life activities.* The number of workers is about 80 people. Thus, domestic solid waste volume is small, about 48 kg/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. In addition, the plastic waste in the domestic solid waste can reduce soil porosity and prevent water absorption into the soil layers. These wastes are generated from worker camp which is in the area relatively isolated from other areas in the city, so the domestic solid wastes can cause local impacts on soil quality in case of failure in the waste control.
- *Impacts due to construction solid wastes created by construction activities.* These wastes includes: refused filled and excavated soil and rock, fallen materials; empty cement sacks, wooden barrel used for packaging equipment and devices, clouts etc.
    - According to the report on construction organization of the subproject, excavated soil volume is proposed to be 6,414.7 m^3. Consideration will be given to reuse and salvage materials, e.g. excavated soil may be used on refilling the foundations and ground leveling. Also taken from the report on construction organization of the subproject, volume of reused excavated soil of the subproject is about 2,077.7 m^3. The remained excavated soil that cannot be reused can suffer washout due to surface runoff during temporary storage at the construction site causing impacts on soil quality in the area and water quality of Sai gon river.
    - Refused construction materials, empty cement sacks, steel, lubricants, fuels, and wood debris will be generated during the construction process. Packaging materials such as wooden barrel, plastic, foam, cardboard boxes used for equipment and devices, electrical parts will also be generated. These wastes are generated at construction site and some material composition of them can be deliquesced by rainwater causing impacts on environment quality of soil and water in case of failure in collection and control.
    - Oil may be leaked from machines and equipment during operation and maintenance activities or from changing fuel and lubricants. These can cause soil pollution in the subproject area. However, the construction site is in the area which was levelled for infrastructure works. Thus, the impacts as described above are insignificant for natural habitat in soil.
- *Impacts due to soil erosion.* Excavation and ground leveling will change structure of topsoil, making uncovered soil that is under impacts of wind or runoff increasing risk of soil erosion. However, terrain of the subproject area is low and flat. The river section through the subproject area has stable embankments. Therefore, soil erosion can be reduced by control measures such as arranging temporary drainage at construction site and scheduling earthworks in dry season.

Mitigation Measures:

99. Soil environmental impact mitigation measures include:

- Use of local labour is encouraged if possible to reduce amount of worker staying in worker camp.
- 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.
- Duration of excavation and leveling should be minimized to avoid bare land for a long time, to reduce soil erosion and runoff due to rain.
- Earthworks should be conducted during dry periods.
- Utilize excavated soil for filling cable trench, foundation pits according to method of balance between excavation and filling.
- Excavated soil which cannot be reused will be collected and transported to the permitted disposal site for treatment as stipulated at Decision No. 44/2015/QĐ-UBND dated 9 September 2015 of Ho Chi Minh City People's Committee Promulgating regulations on management of sludge in Ho Chi Minh City.
- Selection of disposal site: HCMCPMB will require civil contractor to prepare a Waste Disposal Plan as part of the Construction/Contractor Environmental Management Plan (CEMP). Based on this disposal plan, civil contractor will be responsible for contracting with specialized unit (e.g. HCMC Urban Environment Company Limited, or other unit with the same function) to collect, transport and dispose the refused excavated materials to the permitted disposal site. The civil contractor and the specialized unit for collecting, transporting and handling all disposal materials must cooperate and submit name and location of disposal site to the subproject's owner before commencing the subproject. The disposal site must have license and be legal location in handling waste materials in accordance with the current stipulations of the city. With proper collection and disposal procedures, the generation of construction wastes will have minimal impact on environment. HCMCPMB will be responsible for including these requirements in the contract documents.
- Collect salvage materials such as steel pieces, cement sacks, wooden barrel, to reuse or sell. Other construction materials which cannot be reused, will be collected, transported and transferred to competent unit for treatment as stipulated at Article 31 of Decree No.38/2015/NĐ-CP date 24 April 2015 of Government regarding waste management.
- Hazardous wastes such as paint containing can, clouts contaminated with oil and 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 the Circular No.36/2015/TT-BTNMT dated June 30th 2015 issued by the MONRE regarding the hazardous wastes management.
- Conduct site cleaning and leveling after construction completion to return the temporary borrowing ground for local community2.
- Present and past land use will be reviewed to assess whether excavated soils are contaminated. If any, contaminated soil should be treated, disposed at a disposal area or a location approved by the DoNRE.

d. Quality of road and traffic activities

Impacts.

100. During the construction, the transportation activities of materials for the construction will increase the volume of traffic for about 1,045 trips of truck (5 to 15 tons) per 12 months (about 4 trips per day in average or up to 18 trips per day in period of

[2] Some vacant lands surrounding the construction area that include traffic corridor of Ha Noi highway and river corridor of Sai Gon river can be used for gathering construction materials, equipment and means.

earthworks)[3]. However, as observed that traffic networks are quite convenient in the subproject area. Majority of traffic routes connecting to the subproject site are main roads such as Ha Noi highway, Dien Bien Phu street and Nguyen Huu Canh street. An increase of 18 trips per day due to the transportation activities of subproject will not be possible to cause any significant impact on traffic flow on these roads but traffic congestion is likely to happen in case of the transportation in rush hours. For sub roads, the road D1 and road D11 that connect from main road to the subproject site will be likely to be affected by the subproject transportation. However, it is considered to cause negligible impacts because these are the newly built roads with high quality for internal traffic in Tan Cang Sai Gon Urban Complex and traffic density is relatively low thereon.

101. Transportation of heavy equipment such as 220kV transformers and 110kV transformers by heavy vehicles is likely to cause overload and degradation for sub roads. However, the substation location is adjacent to riverside of Sai Gon River, one of main waterways in Ho Chi Minh City, so it is proposed to use the waterway for transportation of the transformers. This helps avoid adverse impacts on the sub roads in the subproject area.

102. For waterway transportation, the subproject location used to be a cargo port that could accommodate container ships. There were large ships running on the waterway of Sai Gon river to enter the port but no adverse impact has been recorded. Thus, use of this waterway for heavy transportation is considered to cause negligible impacts on the river as well as structures on the both sides of river. However, there is a large number of cruise ships on Sai Gon river in current time, especially the river section near the subproject location, so the waterway transportation is likely to affect the operation of these cruise ships that have not acquainted with sharing their way with cargo ships since the port stopped its operation. The impact is considered low and able to be mitigated.

Mitigation measures

103. The Contractor will be required to prepare, educate workers, and implement a Transportation and Traffic Management Plan as part of the CEMP. Mitigation measures to be applied will include:

- Arrange reasonable transportation schedule to avoid rush hours to reduce traffic obstacle, the rush hours will be determined on the site after civil work starts.
- Arrange traffic direction at access roads to ensure project vehicles are not causing congestion.
- Ensure vehicles are maintained regularly and require that vehicles and machinery using combustion engines has and maintains valid operating permits throughout the project schedule. The permits shall form part of the bid documents.
- Set up construction site regulation for truck drive and provide training for them to increase responsibilities during driving the vehicles;
- Require the contractor/s to Implement road safety training with the content including regulation on speed limits of vehicles, traffic route for vehicles to go into and out of construction site, stopping point and unloading, and adherence to speed limits.
- Rehabilitate any damage to existing roads that may be caused by the movement of construction vehicles to the site. This will be a condition for the release of the contractor's performance bond;
- Place sign boards near construction sites (one warning board at the junction of road D1 and road D11 and one at the junction of Nguyen Huu Canh street and road D1) to direct traffic means to slow down when enter the sub road leading to the construction area.

[3] The number of transport trips is calculated based on the quantity of construction materials that is presented in the report on construction organization of the subproject.

- Arrange waterway transportation schedule to avoid the time of operation of cruise ships, the cruise ships usually travel in the time from early evening to midnight.
- Announce the waterway transportation schedule of subproject to owners of cruise ships.

e. Occupational health and safety of workers

Impacts

104. Construction activities may cause harm and danger to the lives and welfare of workers specifically: i) accidents can be happened during operation of machines, vehicles or working at height; ii) traffic accident during transportation of facilities, materials for construction of the subproject; iii) low quality of living condition may cause eye affection, skin disease and hear relative disease; and iv) electric shocks during connecting and test electric with the existing power grid. However, the risks/failures could occur at low probability because i) workers who operate machine or work at height will require professional skills as regulation; ii) as mentioned above, demand of transportation is not much; iii) as stated in design report, a worker camp will be built for workers on the site, which will help to ensure sanitation condition for workers; and iv) testing of electric equipment will require strict and specific procedures which will help to reduce electric shocks.

Mitigation measures:

105. The Contractor will be required to prepare, educate workers, and implement a Health and Safety Plan as part of the CEMP. Mitigation measures to be applied will include:

- All construction equipment and tools will be carefully examined for quality and quantity before use.
- Contractor needs to work with Construction Supervision Consultant (CSC), Project Implementation Consultant (PIC) and HCMCPMB to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment, general safety requirements.
- Workers shall be provided with appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc. at no cost to the employee and force them to use.
- A first aid kit will be provided at the construction site to ensure patients can receive first aid timely before transporting them to the medical station/hospital.
- Contractors will ensure to provide safe drinking water to workers for daily uses.
- 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.
- The danger areas must have signs.
- Safety and fire prevention for the construction area by some simple methods such as water tanks, sand tanks, buckets, shovels, fire ladder.

- Contact the local fire protection agencies to take measures to ensure safety in the fire prevention.
- 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.

f. Community health and safety

Impacts.

106. Impacts on health and safety of community may include i) dust and noise generated due to increased traffic activities from the transport of materials; ii) traffic accident during transportation of construction material and waste to and from the construction site; (iii) fires, emergency spills of materials especially in temporary storages of fuel and inflammable materials (paint, gas, DO (Diesel Oil), FO (Fuel Oil) etc.); iv) accidents of residents if they enter into work areas without permission, for example, falling into foundation pits, electric shock during testing electric, etc. However, these impacts is considered as minor since: i) the construction site is relatively isolated from existing residential areas; and ii) construction activities will be in short time and within the construction area;

Mitigation measures

107. To mitigate these potential impacts, the civil Contractor will be required to develop a Community Health and Safety Plan (CHSP) that incorporates good international practice and recognized standards, as part of the CEMP. The CHSP will 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 for traffic accident, electrocution, and oil spill. The detail guidance is described in the emergency response plan (**Appendix E**);
- Contractor should install barriers (temporary fence) at construction areas to deter people access to the site;
- The local people shall not be allowed in high-risk areas (excavation sites and areas where heavy equipment is in operation);
- Contractor should remain the light on during the night time on all construction sites;
- Contractor should provide warning signs to warn people of danger place; and
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of firefighting.

g. Social aspect

Impacts

108. It is estimated that 80 workers will be mobilized on the construction site, and concentration of workers and poor housekeeping by contractors at work sites could lead to several social problems on the site such as social evils and infectious diseases could negatively affect residents. Conflict between workers and local people is likely to happen because of difference of culture. Surrounding residential areas will be the main impacted objects, but the impact is considered as minor due to small number of workers, construction activities mostly implemented within the subproject area, where it is relatively isolated and far from existing residential areas. And impacts could be controlled through appropriate mitigation measures.

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, contractors provide the training for workers on occupational safety regulations and sufficient skill to communicate with local residents as stated in Decree No. 39/2016/ND-CP dated 15 May 2016 of the GOVERNMENT OF VIET NAM regarding the detailed regulation on some articles of the Occupational Safety and Hygiene Law and Circular No. 22/2010/TT-BXD dated on 3 December 2010 of MOC on labour safety in work construction.
- Equip medicine cabinet for protecting workers' health in time.
- 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 CPC during the construction phase. They should also establish the relationship with the local authority 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.
- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the locality.

2. Protected Areas, Rare and Precious Species, and Cultural Resources

Impacts

109. The 220kV Tan Cang substation and its access road are not located in any protected area and it has no rare, precious and endangered animal/plant species in the area as well as the vicinity.

110. The subproject will not affect any culturally sensitive area such as mosques, temples, and burial sites since the location of substation and its access road already avoided these sensitive areas. Chances of detection of valuable relics and cultural values will be anticipated by contractors, especially during excavation process.

Mitigation measures

111. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And Executing Agency/Implementation Agency (EA/IA) informs the authorized agency: Department of Culture, Sports and Tourism (DoCST) to determine their value and treat appropriately. Work at the found site will be stopped until DoCST allows to continue working.

3. Repair, Restore, and Return the Ground after Construction Completion

112. 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

113. The potential impacts of the operation and maintenance of the substation are generally related to biological environment, the occupational and community health and safety issues as well as management of hazardous wastes. However, the substation is

located in the second infrastructure planned region of Sai Gon – Tan Cang Complex Area. This is a vacant land without vegetation. The surrounding area is the big construction site of Vinhomes Central Park Resisdence, so no vegetation is found there. Small area of urban greenery is found and this greenery lane is planted and planned by Vingroup Corporation so there is not any impact on biological environment. Hazards to occupational and community health and safety such as exposure to high voltage electrical equipment, working in high elevation, exposure to electromagnetic field (EMF) and generation of domestic and hazardous wastes. These impacts are reversible, manageable, and can be mitigated with proper engineering and management controls. High Voltage Power Network Company will be responsible for the operation of the subproject and its ancillary services.

114. Among the significant environmental impacts of the substation operation are:

1. Occupational health and safety of the workers

Impacts

115. The occupational health and safety issues inherent to the operation of the high voltage substation include hazards due to exposure to high voltage systems when maintaining and repairing the electric equipment, accident risk due to working in heights, and potential exposure to EMF when maintaining and repairing the substation or working for long time in the substation. Accidents that may occur include electrocution, fires, and explosion. However, given the subproject design, these impacts are assessed as relatively low because probability of the mentioned risks rarely occurs.

116. With technique of GIS, the electrical equipment is absolutely insulated from its case by electricity insulating gas that helps prevent works' exposure to live power facilities. The connection lines to substation are underground, no electrical tower/pole of overhead line, so working in height is not necessary. The control house where operation workers stay for long time is reasonably placed in safety distance from high voltage equipment such as transformers, distribution equipment, so workers' potential exposure to EMF will be reduced.

Mitigation measures

117. HCMC high voltage Company shall be guided by the "Environmental, Health, and Safety Guidelines – Electric Power Transmission and Distribution" (IFC) dated 30 April 2007 when working at the power facilities. Some of the prevention and control measures for health and safety when working with live high-voltage electrical equipment are:

- Restricting access to electrical equipment by workers only trained and certified to work on electrical equipment. Personnel will wear PPEs at all times when entering safety zones.
- Adherence to electrical safety standards.
- Proper grounding and deactivation of live power equipment during maintenance work or if working in close proximity to the equipment.
- Provision of personal safety devices or PPEs for workers and other precautions.
- Observe guidelines to minimum approach distances when working around operational equipment. The entrance to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors will be kept locked unless such entrances are under the observation of a qualified person at all times.
- Identification of potential exposure levels in the work area including surveys of exposure levels and establishment of safety zones.
- Posting of safety reminders and warning signs.
- Check compliance with "Environmental, Health, and Safety Guidelines – Electric Power Transmission and Distribution" (IFC): Table 3 on the International Commission on

Nonionizing Radiation Protection (ICNIRP)[4] exposure limits for occupational exposure to electric and magnetic fields.

- Check compliance with government requirement on Article 7, Decree 14/2014/NP-CP in terms of number of working time in a day and night under the Right of Way depending on electric field intensity.
- 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 will be field marked to warn qualified persons of potential electric arc flash hazards.

2. Community Health and Safety

Impacts

118. The community may also 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. However, with a wall fence of 4m height around the substation, it is impossible for local people to be in contact with high voltage electricity. Moreover, the operation unit will dispatch the guard on duty at the substation and boards/signals for warning people if danger will be provided at the substation, so the electrocution hazard will be minimized or will not happen.

119. In terms of exposure to EMF, the transmission frequency commonly used in transmission systems ranges from 50–60Hz, which is considered as extremely low frequency with impacts becoming low with distance. Trees, buildings, and other materials that conduct electricity shield the electric fields. In general, the electric fields are strongest close to the source and diminish with distance. The World Health Organization (WHO) reported that there is still weak evidence about substantive long-term health issues related to low frequency electric fields at levels generally encountered by members of the public. The potential health effects associated with exposure to EMF are not well established due to lack of empirical data demonstrating adverse health effects. However, the public will be warned about the safety distances from the transmission system through warning signs.

120. The subproject will be designed and constructed in compliance with regulations on electrical safety under Decree No.14/2014/ND-CP, the limit to safety corridor of the substation is its outer fence. Thus, impacts on local people caused by exposure to electrocution hazards and EMF of this subproject will be insignificant.

Mitigation measures

121. To prevent electrocution risk, HCMC high voltage Company will implement the following:

- Provision of warning signs and anti-climbing devices on the substation fence and all towers
- Grounding of conducting objects such as fences or other metallic structures near the substation.
- Check compliance with “Environmental, Health, and Safety Guidelines – Electric Power Transmission and Distribution” (IFC): Table 1. ICNIRP exposure limits for general public exposure to electric and magnetic fields;

[4] ICNIRP is a non-governmental organization formally recognized by the World Health Organization (WHO), which published the “Guidelines for Limiting Exposure to Time-varying Electric, Magnetic, and Electromagnetic Fields” following reviews of all the peer-reviewed scientific literature, including thermal and non-thermal effects. The standards are based on evaluations of biological effects that have been established to have health consequences. The main conclusion from the WHO reviews is that exposures below the limits recommended by the ICNIRP international guidelines do not appear to have any known consequence on health.

- Increase in awareness of communities close to the substation about hazards of electricity.

3. Generation of Domestic and Hazardous Wastes

Impacts

122. Chemicals that are commonly handled in the substation are mineral oil in transformers and other electrical components for both insulation and cooling. Although relatively inert, the quantity of mineral oil at a substation is very large with a single transformer and its associated equipment containing up to 55,000 liters of oil per transformer. According to operation procedure, transformer oil will only be discharged and refilled by new oil after 20-30 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. Also, there are potential hazardous materials and oil spills associated with the maintenance and repair of equipment. Other hazardous wastes from substations include used lead acid batteries, oily rags from maintenance activities, and busted lamps with small quantity. Oil leak and accidental spills of hazardous waste could give rise to contamination of soil and groundwater in case of failure in control.

123. There are also domestic wastes such as garbage and sewage from workers at the substation. Improper disposal may lead to unsanitary conditions around the substation. It is therefore important for the substation workers and HCMC high voltage Company to observe good housekeeping at the substation and to avoid disposal of the waste materials at adjacent areas.

Mitigation Measures

124. The transformers and equipment will meet international standards including regular maintenance and inspection program to check leaks. The areas around the transformers and oil storage areas will be provided with secondary containment with impervious bund capable of holding the oils, and hazardous wastes in the area. Discharges from these spill bunds with the potential to be contaminated with oil will be directed to the oil-water separators. These are particularly necessary within the substation yard.

125. Waste classification system of the substation needs to be improved including the provision of waste bins at the workers quarters. Guidelines on waste classification will be issued to workers to direct everyone to use these waste bins properly and to avoid indiscriminate dumping at adjacent area.

4. Emergency Preparedness at Substation

Impacts

126. There are several risks that could occur with the operation of the substation. Among these are the likelihood of equipment over time which could compromise its structural integrity, potential fire events, explosion of equipment, and being hit by lightning.

Mitigation Measures

127. Lightning arresters will be provided in the substation. Regular inspections of the facilities would help identify damaged or corroded parts.

128. In case of fire events, explosion, and other related situations, a fire management program is included in the emergency preparedness and response plan of the subproject. Sufficient number of fire protection equipment, fire suppressants, and fire water tank are available to address the emergency requirements of substation.

129. Workers are also trained on emergency preparedness and response procedures and a manual on safety and emergency procedures is prepared and disseminated to workers. The health and safety guidelines include measures for fighting oil fires and cautionary measures when working with live power equipment and working at height.

5. Climate Change

130. Regional and Global climate change modeling project showed that climate change induced changes to the frequency and severity of rainfall events in the subproject area. Design of 220kV Tan Cang substation considered and calculated floods due to storms with the frequency of P=2%, in accordance with Decision 1179/QD-EVN of Vietnam Electricity dated 25 December, 2014 relating to the stipulations and procedures of survey to design power projects.

VII. ANALYSIS OF ALTERNATIVES

131. In the feasibility study phase, design consultant coordinated with subproject owner to collect alternatives in designing the subproject's site. The selected subproject's site was based on the following criteria:

+ Geographical condition;
+ Land acquisition;
+ Near load center;
+ Convenience for connection of 220kV, 110kV and 22kV to the substation;
+ Convenience for moving heavy equipment;
+ Appropriateness with the general planning of the region;
+ Respond regional load demand, minimize effects to environment and create good conditions for centralized development of urban areas and the region; and
+ Avoiding sensitive areas and the cost for investment considered in the selection of site alternative as well.

132. Based on the above criteria, the design consultant has conducted field survey and proposed two alternatives to build the 220kV Tan Cang substation as the following figure and table:

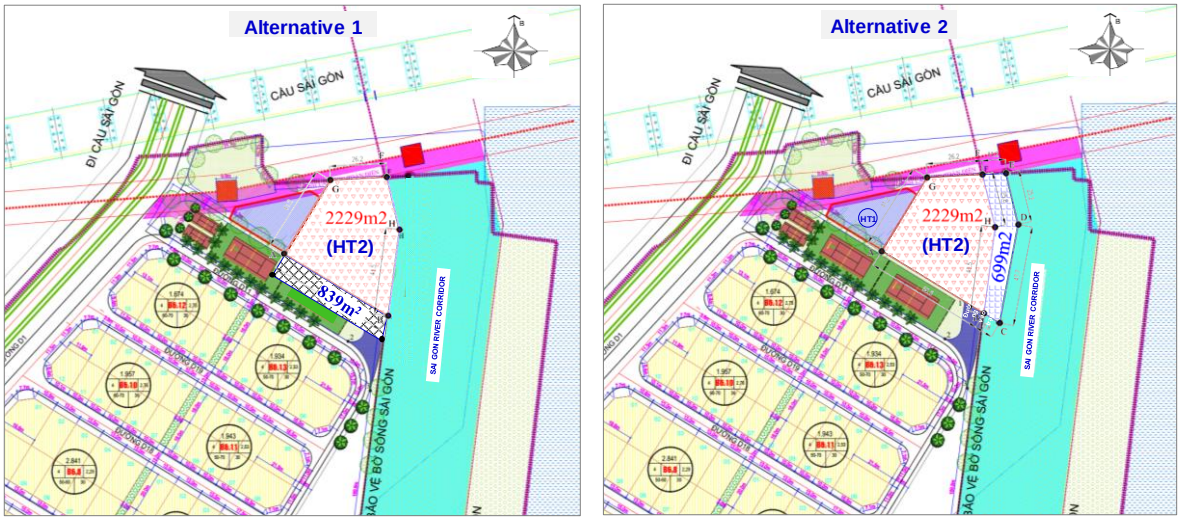

Figure 7. *Map of location options*

Table 14. Analysis of alternatives to build the 220kV Tan Cang substation

Item	Alternative 1	Alternative 2
Total area of substation	3,068m^2, including - 2,229m^2 of the area in Saigon Tan Cang Complex's planning area and; - 839m^2 of the area in the planning park of Saigon Tan Cang Complex.	2,928m^2, including - 2,229m^2 of the area in Saigon Tan Cang complex's planning land and; - 699m^2 of the area in the buffer zone of Saigon river. This part is only used for roads in the substation and construction of substation fence.
Access road	6m in width, including 2 ways; - The way from the substation gate to the planning street D1 of Saigon Tan Cang complex is 115m, 220kV and 22kV underground cable connected to the substation is together installed beneath this way. - The way from the substation gate to	9,4m in width, 30 in length and total 281m^2. - The way connecting the substation gate to the internal road D11 of Vinhomes.

	the planning street D11 of Saigon Tan Cang complex is 10m.	
The connection of 220kV, 110kV and 22kV transmission lines	The connection method is as follows: - The section of 220kV underground cable connecting to Cat Lai: From 220kV Tan Cang GIS substation, the route goes along the street to the substation and Saigon 2 bridge, it is around 45m/circuit, and then it follows Saigon 2 bridge to Tran Nao street in district 2; - The section of 220kV underground cable connecting to Tao Dan: at 220kV Tan Cang substation, the route follows the street to the substation, Dien Bien Phu street and Tao Dan substation; - At the outgoing section of 110kV underground cable from Tan Cang substation, the route follows the street to the substation, Saigon 2 bridge, and Nguyen Huu Canh street, including 08 circuits: + 2 ciruits for Highway, 02 circuits for Thu Thiem 3 and 2 circuits for Ba Son: the route following the street to the substation is around 80m/circuit, and + 2 circuits for An Phu and Metro Tan Cang: the route following the street to the substation, Saigon 2 bridge is around 45m/circuit, after that the route follows Saigon 2 bridge to Tran Nao in district 2. - The outgoing section of 22kV underground cable from Tan Cang substation follows the street to the substation, this route includes 7 circuits around 80m/circuit.	The connection method is as follows: - Connection of 220kV side: 220kV Tan Cang substation is installed at Saigon Tan Cang complex, the surrounding area has only 220kV Cat Lai substation and 220kV Tao Dan substation which are convenient for connection to Tan Cang substation; - 220kV Cat Lai substation is the intermediate substation supplied by 220kV Thu Duc substation and Nhon Trach Power Plant. 220kV Tao Dan substation gets power supply from 220kV Nha Be substation (this is the source substation connected to Nhon Trach Power Plan and Phu My Power Plant). Therefore, it is scheduled to connect 220kV Tan Cang substation to Cat Lai substation and Tao Dan substation. - Connection of 110kV side: 220kV Tan Cang substation will supply power source to 110kV Xa Lo substations (02 circuits), 220kV Thu Thiem substation (02 circuits), 110kV Ba Son substation (02 circuits), 110kV An Phu substation (01 circuit) and Metro Tan Cang substation (01 circuit).

133. Solution for connection of 220kV, 110kV and 22kV underground cable to Tan Cang substation are:

a) Towards Vinhomes:

- 220kV cable: 2 circuit 220kV underground cable connected to Tao Dan substation: from 220kV Tan Cang substation, the route goes over the substation fence at Vinhomes and is underground at the tennis court to Dien Bien Phu street and then goes to Tao Dan substation by underground cable with the length of 5,200m.
- 110kV cable: 02 circuits for Highway, 02 circuits for 220kV Thu Thiem substation and 2 circuits for Ba Son: from 220kV Tan Cang substation, the route goes over the substation fence at Vinhomes and is underground at the tennis court to Nguyen Huu Canh street, and then the joint pit at the tower 22.
- 22kV cable: 12 circuits of 22kV underground cable from 220kV Tan Cang substation go over the substation fence at Vinhomes and are underground at the tennis court, 4 circuits will be supplied to Vinhomes, 8 remaining circuits go to Nguyen Huu Canh Street.

b) Towards Saigon bridge:

- 220kV cable: 220kV Tan Cang substation is connected to 220kV Cat Lai substation by 2 circuit combined transmission line and connected to the substation by underground cable: from 220kV Tan Cang substation, the route goes over the substation fence at Saigon bridge, after that follows Saigon 2 bridge to Tran Nao street in district 2.
- 110kV cable: 02 circuits for An Phu and Metro Tan Cang: from 220kV Tan Cang substation, the route goes over the substation fence at Saigon bridge and then follows Saigon 2 bridge to Tran Nao in district 2.

134. The comparison of the two alternatives is as follows:

Advantages:

+ Both alternatives are good for 220kV, 110kV and 22kV transmission lines connecting to the substation.
+ The land area belonging to the plot of land for technical infrastructure No.2 in Sai Gon Tan Cang complex (coded as HT2) is appropriate with the planning plan 1/500 of Saigon Tan Cang complex approved by Ho Chi Minh City People's Committee.
+ Investment expenditure for these transmission lines is similar.

Disadvantages:

+ Alternative 1: The extra land area is located at the area planned for park of the complex.
+ Alternative 2: Land from buffer zone of Saigon river must be used to build substation fence and internal ways in the substation.

135. To be approved by Ho Chi Minh City People's Committee, the alternative 2 is selected for the plan of location of substation due to the following reasons:

- Appropriate with planning of Saigon Tan Cang Complex;
- Convenient in transportation and management and operation later on;
- Convenient for arrangement of 220kV, 110kV and 22kV outgoing feeders;
- Convenient in agreement of location with local authorities;
- Convenient in compensation and site clearance.

VIII. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Public Consultation

136. During the subproject preparation stage, the following activities were accomplished:

Activity 1: Investigation and discussion with local authorities about the substation location.

Activity 2: Site investigation, Preparation of Environmental Protection Plan[5] and EMP for the subproject.

Activity 3: Public consultation

137. A public consultation strategy with the stakeholders was established to meet the requirements of ADB SPS. This strategy embodied the principles of meaningful, transparent and comprehensive consultation to ensure that affected people groups and fragile people groups such as women and poor people, were given equal opportunities to participate in the design of the subproject.

1. Identification of Stakeholders

138. Stakeholders were identified and participated in consultation. Communication with the stakeholders focused on the affected organizations and communities, and persons directly affected by the proposed subproject. The stakeholders of the subproject include:

- Institutional stakeholders such as: (i) People's Committee of ward 22, (ii) Project management agency (HCMCPMB), (iii) IEE preparation consultant (PECC2), and (iv) leaders of ward 22;
- Organizations/unions such as Women's Union of ward 22, Fatherland Front of ward 22, Veterans Organization of ward 22 and Youth Union of ward 22 which provided various information for the design of the subproject and which might participate in implementation of measures and interventions;
- Organization, individuals affected by the subproject including Tan Cang Sai Gon Corporation; Tan Lien Phat Construction Investment Corporation.

2. Public Consultation Meeting

139. Formal public consultation meeting was held at People's Committee of ward 22 of Binh Thanh district, Ho Chi Minh city on 9 March 2016. During the meeting, participants and consultant unit has discussed scope and environmental, social issues, impacts on environment of the subproject and grievance redress mechanism for environmental, social and compensation problems. The public consultation meeting was organized with the representatives of ward 22 People's Committee and Mass Organizations. There are 11 participants, from them 06 are females.

140. Public consultation meetings consisted of the following three component procedures:

i. On the behalf of the subproject's owner, the consulting unit introduced the subproject, including scope, location, engineering issues, the necessity of construction of the above-mentioned subproject;

ii. Environmental consultant, as a representative of HCMCPMB, presented environmental policy, safety regulations of the ADB and the Vietnam power sector, anticipated environmental impacts caused by the subproject and respective mitigation measure (to be developed in IEE's report), grievance redress mechanism for environmental, social and compensation problems; and

iii. Social/resettlement consultants presented: ABD's resettlement/compensation plan; impacts on land and properties acquisition; policies of the Government and local

[5] See footnote 1.

authorities, the Project's policies on compensation for the losses when the State acquires land and properties on land; and potential impacts due to land acquisition.

141. During the meeting, participants presented their questions and comments on environmental issues. The consulting unit (PECC2), on the behalf of the subproject's owner, answered and explained all their questions.

142. Participants of the public consultation meeting included the ward leaders, the representatives of Vietnamese Fatherland Front of the locality, land surveyor, Veterans Organization, Women Union, Communist Youth Union and Trade/Labor Union and land surveyor. List of participants of the public consultation meeting is referred in Appendix B.

3. Results of Public Consultation

a. Comments received during the public consultation meeting

143. The summary of comments/questions received during the public consultation meeting and answers of subproject owner and consultant are summarized in Table 15.

Table 15. Discussion summmary of public consultation

Place and time	Comments/questions of local authority	Subproject's owner and PECC2 answers	Project's response (issues are addressed by the IEE)
Ward 22 of Binh Thanh district, Ho Chi Minh city, on 9 March 2016	Transporting materials should ensure an environmental hygiene to avoid scattering on street and causing an urban inaesthetic and affecting the surrounding environment.	- The subproject's owner agreed all comments of local authority and he commits to ensure environmental hygiene during construction. - Environmental issues and mitigation measurement will be included in the bidding document by the subproject's owner, and then the construction contractor shall commit and meet them as stated in the documents (including safety in construction period).	Environmental protection measurements, (including mitigation measurements on dust, waste, noise, mud) and safety method during construction are presented in section VI. Environmental Impacts and Mitigation Measures, and Section X. Environmental Management Plan.
	Construction is carried out near Sai Gon river so it is required to avoid scattering mud or soil in the riverbed.		
	The subproject's owner should announce an implementation schedule to the surrounding people before constructing the subproject.	The subproject's owner argree to announce an implementation schedule in details to local authority and people before constructing the subproject and he also dispatches a staff to the site for following the construction process and also contact with the local authority all information relating to the subproject.	The information disclosure to the local authority is 'presented in Section VIII. Information Disclosure and Public Consultation.
	The subproject's owner should announce an implementation schedule in details to People's Committee of ward 22 before constructing the subproject and dispatch staff, who understands clearly scope, schedule of the subproject and he/she will follows the subproject during the construction phase. This staff will contact with the local authority if needed.		
	The location of subproject does or does not affect the life of	Location of the subproject does not affect the local people's life. This location	The existing environment, land use and location of the

Place and time	Comments/questions of local authority	Subproject's owner and PECC2 answers	Project's response (issues are addressed by the IEE)
	surrounding people.	was agreed by the relevant authorities.	220kV Tan Cang substation are presented in section IV. Description of Subproject.
	The subproject's owner should execute the procedures on land acquisition and delivery with relevant authorities to make a base for constructing the subproject.	The subproject's owner recorded all comments of local authority relating to procedures on land acquisition and compensation.	Land acquisition and compensation are presented in section VI. Environmental Impacts and Mitigation Measures, and Section X. Environmental Management Plan.
	Location of the subproject is in public area in ward 22 of Binh Thanh district, so it will not execute compensation work.		
	The subproject's owner will bear responsible for paying taxes of land as stipulated when it is in operation phase.		
Conclusion	The Ward People committee, mass organization and subproject affected people of Ward 12 agree and will support the construction of Tan Cang 220kV SS.		

B. Information Disclosure

144. Formal information disclosure to the relevant stakeholders of "220kV Tan Cang substation" subproject that is presented in the IEE aims to begin a continued information disclosure and participation of relevant parties as the subproject is implemented. As part of the communication strategy for the relevant parties (stakeholders), regular information exchange meetings with stakeholders are strongly encouraged throughout the implementation of the subproject

145. IEE must be easily understandable in order that the stakeholders can comment in written and verbal form in local language of Vietnamese. At a minimum, an executive summary of the IEE should be written in Vietnamese and distributed to office of ward/district People's Committee (DPC). IEE should be available at the EVNHCMC office in Ho Chi Minh City, and at the subproject localities. Similarly, all reports on public consultation with the stakeholders, environmental monitoring, and EMP implementation prepared by the EA/IA should be available at the above offices and localities. IEE will be available on the ADB website, as well as EMP report is prepared by the EA/IA after starting the subproject's implementation.

146. The People's Committees of ward 22 of Binh Thanh district, Ho Chi Minh city received the draft IEE in Vietnamese version during the public consultation process on 3 March 2016.

C. Future Consultation Activities

147. The whole final IEE (after receiving the letter of No Objection from ADB) will be translated into Vietnamese language, then sent to ward 22 People's Committees of Binh Thanh district for disclosure. By doing this, local authorities and people can easily refer the final IEE.

148. HCMCPMB will, before starting the construction work, i) dispatch a focal person, who clearly understands the subproject, and who will be responsible for the communication with stakeholders; and ii) announce a detailed implementation schedule to

the relevant local authorities (People's Committee of ward 22) and the communities in the subproject area.

149. In addition, during subproject construction phase, subproject owner and construction unit will continue to receive feedback from communities and affected households. All their feedbacks will be supervised and monitored by CSC.

150. Following the loan agreement of the project[6], EVN HCMC will disclose relevant information of environmental monitoring reports (See Section X) to the affected persons promptly upon submission. The environmental monitoring reports will be translated into Vietnamese language and sent to ward 22 People's Committees of Binh Thanh district by HCMCPMB for disclosure and then local authorities and people can refer this.

[6] Schedule 5, Para 10, a) of LOAN AGREEMENT (Ordinary Operations) DATED 7 NOVEMBER 2014 <https://www.adb.org/sites/default/files/project-document/149476/46391-001-lbj.pdf>

IX. GRIEVANCE REDRESS MECHANISM

151. A well-defined grievance redress and resolution mechanism will be established to address the affected peoples' grievances and complaints regarding the environmental issues, land acquisition, compensation and resettlement in a timely and satisfactory manner. All affected peoples will be made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process will be published through effective information dissemination.

152. Affected peoples are entitled to lodge complaints regarding any aspect of the affected environments, land acquisition and resettlement, problems such as, noise, pollution, entitlements, compensation rate and payment, and procedures for resettlement and income restoration programs. Affected peoples' complaints can be made verbally or in written form. In the case of verbal complaints, the contractor/HCMCPMB will be responsible for make a written record during the first meeting with the affected peoples.

153. An appointed grievance committee with environmental and social issues will be set up in the local ward comprising of the local leaders. The designated ward officials shall exercise all efforts to settle the affected peoples' issues at the ward level through appropriate public consultation. All meetings shall be recorded by the grievance committee and copies shall be provided to the affected peoples. A copy of the minutes of the meetings and actions undertaken shall be provided to the EA/IA, and ADB as requested.

154. Procedures for grievance redress is defined as below and summarized in ***Figure 8***. Procedures described below should apply easily to both social and environmental issues and be consistent with the legal procedures for grievances/disputes resolution in Viet Nam.

Stage 1: Affected peoples can lodge their grievance/complaint verbally or in written form to the Contractor/subproject owner because initial environment issues will most likely be construction-related. The Contractor/subproject owner is responsible for receiving, discussing, negotiating with the affected peoples to solve their grievance/complaint within 15 days from the date the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to affected peoples.

Stage 2: If no understanding or amicable solution can be reached or if no response is received from the Contractor/subproject owner within 15 days from filing the complaint, the affected peoples can elevate the case to the Ward/Commune People's Committee (CPC). The CPC will respond within 15 days upon receipt of affected peoples complaints. All meetings shall be recorded and copies of the minutes of meetings will be provided to affected peoples.

Stage 3: If the affected people is not satisfied with the decision of the Ward People's Committee within 15 days since the date of submitting complaints, or in the absence of any response, the affected peoples can appeal to the Precinct/District People's Committee (DPC). The DPC will respond within 15 days from the day the complaint is received.

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

Stage 5: If the affected people is still not satisfied with the decision of the HCMC People' Committee or in the absence of any response within the stipulated time, the affected peoples, 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 EVNHCMC, PCP, DPC, CPC and the affected peoples. If, however, the affected people is still not satisfied with the City Court's decision, the case may be elevated to the court at higher level (the Higher Court).

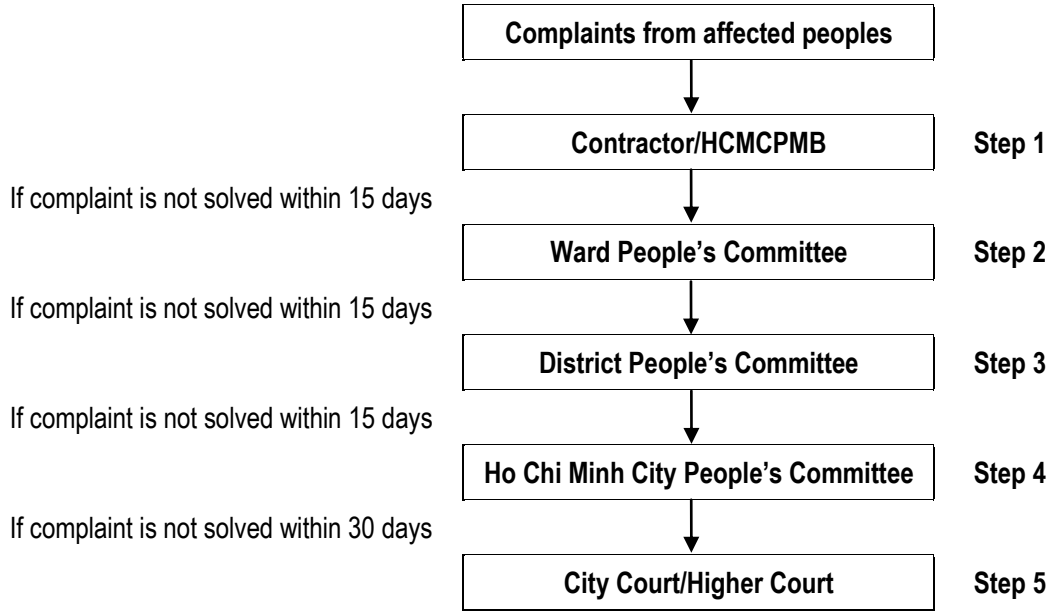

Figure 8. Public grievance redresses process

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

156. In cases, affected peoples can not write or are not unable to express their grievances verbally, they are encouraged to seek assistance from the local authority, NGOs, or other members in their family, village heads or community chiefs in order for their grievances to be recorded in writing, and to approach to the documents, and any survey or valuation of assets, to ensure that where disputes occur, all details have been recorded accurately enabling all parties to be treated fairly. Throughout the grievance redress process, the responsible agency will ensure that the concerned affected peoples are provided with copies of complaints and decisions or resolutions reached.

157. If all efforts to resolve disputes under the grievance procedures remain unresolved or unsatisfactory, affected households have the right to directly discuss their concerns or problems with the ADB office in Southeast Asia through the ADB office in Viet Nam. If affected households are still not satisfied with the responses of the ADB office in Viet Nam, they can directly contact the ADB Office of the Special Project.

X. ENVIRONMENTAL MANAGEMENT PLAN

158. An EMP has been prepared for the subproject "220kV Tan Cang substation" with the purpose of integrating the results of the IEE into a formal management plan that is implemented in parallel with the subproject to prevent or minimize potential environmental impacts and issues that were identified by the IEE.

159. The EMP consists of an impacts mitigation plan, a monitoring plan. EMP also prescribes the institutional responsibilities for the implementation of the EMP. 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.

A. Mitigation Plan

160. Environmental impact mitigation plan has been developed based on respective impacts and mitigation measures for subproject activities. 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 16.

Table 16. Environmental Impact Mitigation Plan

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
Preparation phase,								
Contract with contractor(s)	Incorporation of IEE and EMP into bidding documents and contracts	Environmental mitigation measures indicated in the IEE, and the EMP will be included in contractor's bidding documents, technical specifications, and contracts for civil constructions and equipment installations. All contractors will be required to strictly comply with the EMP.	Subproject area	Before construction begins	Once for all tenders and contracts	No marginal cost	PIC	PECC2/EVNHCMC/HCMCPMB/Contractors
Contract with other entities	Compliance with the Law on Environmental Protection	Identify the following entities and make a contract with them; - A competent unit (e.g. HCMC Urban Environment Company Limited) to collect, transport and treat garbage and toilet waste in septic tank. - A permitted disposal site for treatment as stipulated at Decision No. 44/2015/QĐ-UBND dated 9 September 2015 of Ho Chi Minh City People's Committee Promulgating regulations on management of sludge in Ho Chi Minh City. - A competent unit for transporting to treat in accordance with the Circular No.36/2015/TT-BTNMT dated 30 June 2015 issued by the MONRE regarding the hazardous wastes management. - A competent unit for treatment as	Subproject area	Before construction begins	01 time Before construction begins	No marginal cost	EVNHCMC/HCMCPMB/PIC	Contractors

[7] 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[7] (USD)	Responsibility	
							Supervision	Implementation
		stipulated at Article 31 of Decree No.38/2015/NĐ-CP date 24 April 2015 of Government regarding waste management.						
Detailed design	Incorporation of IEE and EMP into the detailed design	The environmental mitigation measures indicated in the IEE and the EMP will be incorporated into the detailed design (including the secondary containment around the transformers and oil storage areas[8]).	Subproject location	Before construction begins	Once with detailed design documents	No marginal cost	PIC	PECC2/ EVNHCMC/HCMCPMB
Construction/ Contractor Environmental Management Plan (CEMP)	CEMP Review and Approval	Contractors will develop CEMP that outlines the manner by which they will comply with the requirements of the IEE and EMP. This will include: - Waste Disposal Plan[9] - Transportation and Traffic Management Plan[10] - Occupational Health and Safety Plan (OHSP)[11] - Community Health and Safety Plan (CHSP)[12]	Subproject site	Before construction begins	01 time Before construction begins	No marginal cost	EVNHCMC/ HCMCPMB/ PIC	Contractors
Land acquisition and compensation	No Impacts, No household whose house or land will be affected by subproject	- Complete procedures for land use, assignment of land use right and financial obligation in accordance with provisions of the land law. - Get the land for subproject in legally assignment of land use right from	The subproject area	Before implementing the subproject	See Resettlement Due Diligence Report	See Resettlement Due Diligence Report	EVNHCMC	DPC of Binh Thanh

[8] See para 124 of the IEE.
[9] See para 99 of the IEE.
[10] See par 103 of the IEE.
[11] See par 105 of the IEE.
[12] See par 107 of the IEE.

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		Tan Cang Sai Gon Corporation. - Consult with DoNRE to get their agreement and guidance about procedures for the land use to ensure no impact on riverside road of Sai Gon river.						
UXO clearance (bombs, mines and other explosives)	Impact on people's and worker's safety (maybe injured or dead if UXO still exist in the subproject area without clearance)	- Engage an authorized UXO clearing contractor to conduct UXO removal and ensure that the civil work shall be only commenced after the UXO clearing form has certificated that the subproject is already been cleared. - The execution of demining and UXO is done following these steps: + Covering UXO detection and clearance area, + Clearing the grounds + Detection by the detector to a depth of 0.3m + Mark, digging test and resolve signal to a depth of 0.3m + Detect bomb by detector to a depth of 5m (put in step with high sensitivity) + Excavation, checked resolve signal to a depth of 3m + Excavation, checked resolve signal to a depth of 5m - Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives in	All construction sites	Before the subproject construction	Once	$ 1.137 Included in the cost of construction ground preparation.	EVNHCMC	Military Unit

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		QCVN 02:2008/BCT on National technical regulation on safety in the storage, transportation, use and disposal of industrial explosive materials, and the other current regulations. - Ensure that the contractors shall only commence site works after the UXO clearing agency has certified that the project areas are already been cleaned						
Construction site arrangement	No impact. This activity help to prevent or avoid impacts by disposal and civil works	- The PPMB requires civil contractor to prepare a Waste Disposal Plan as part of the CEMP and to make a contract with specialized unit (e.g. HCMC Urban Environment Company Limited) whose disposal site is ready to collect, transport and dispose the refused excavated materials to the permitted disposal site. - HCMCPMB is responsible for supervision and include this content in civil work contracts. - Contractor develops, as part of CEMP, Transportation and Traffic Management Plan for equipment and materials to reduce negative impacts. - Contractor will arrange the temporary yards for stockpile and material gathering site within the substation area or nearby. - Contractors must have the license	Subproject site	Before construction begins	01 time Before construction begins	No marginal cost	EVNHCMC/ HCMCPMB/ PIC	Contractors

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		for safe and environmental requirements of mobilized machines and vehicles.						
Construction Phase of Subproject								
Concentration of workers and domestic wastes generated	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	- Contractors consider hiring local labors for unskilled jobs to prevent or minimize influx of migrant workers, and incidence of social diseases and community unrest. - Provide mobile toilet with septic tank for worker camp to collect domestic wastewater. The capacity of the septic tank should be 4.2 m^3 at minimum. The contractor/s will periodically hire competent unit (e.g. HCMC Urban Environment Company Limited) to collect toilet waste in septic tank. - Put dustbins at worker camp for collecting rubbish. Then hiring HCMC Urban Environment Company Limited to collect, transport and treat adequately. - Worker camp must have adequate rainwater drainage system. - Examine periodically worker health. Equip medicine cabinet for protecting workers' health in time. - Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers.	At worker camp	Throughout construction phase	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		- Provide the training for workers on occupational safety regulations and sufficient skill to communicate with local residents. - Establish the specific food safety regulations for construction workers. - Construction units should implement temporary residence registration for all construction workers to PC of ward 22 at the subproject area. 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 people in order to avoid conflicts arising. - 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.						
Refused rock and soil, debris, other hazardous wastes generated by	Cause pollution of soil and surface water by refused rock and soil, debris, other hazardous	- Salvage excavated soil, rock for filling cable trench, foundation pits, according to method of balance between excavation and filling. - For excavated soil that cannot be reused, it will be collected and	All construction sites	Throughout construction phase	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
soil excavation and filling, construction activities, and equipment installation	wastes	transported to the permitted disposal site for treatment as stipulated at Decision No. 44/2015/QĐ-UBND dated 9 September 2015 of Ho Chi Minh City People's Committee Promulgating regulations on management of sludge in Ho Chi Minh City. - Collect salvage materials such as steel pieces, cement sacks, wooden barrels, to reuse or sell. For other refused construction materials that cannot be reused, it will be collected, transported and transferred to competent unit for treatment as stipulated at Article 31 of Decree No.38/2015/NĐ-CP date 24 April 2015 of Government regarding waste management. - If excavated soil is suspected contamination, it must be tested, and disposed at a disposal area or a location approved by the DoNRE. <u>Hazardous waste impact mitigation</u> - For refused grease, oil: implement repair and maintenance of equipment, machines and vehicles at local garage. Waste grease, oil will be collected to treat at this garage as stipulated. - Other wastes such as paint containing can; duster cloth with oil, grease; failed fluorescent lamp must be collected into tanks and kept						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with the Circular No.36/2015/TT-BTNMT dated 30 June 2015 issued by the MONRE regarding the hazardous wastes management.						
Construction activities and transportation of materials	Noise, dust and exhausts impact on ambient air environment quality	- Cover stockpile of excavated soil and keep it moist. - Maintain vehicles used for construction, and equipment and machines emitting noise, exhausts properly to minimize emission and get valid operating permits throughout the project schedule. - Limit operation of vehicles and equipment at night if possible to minimize noise. - Cover construction materials such as cement, sand and aggregates during transit and while stored on-site. - Spray water on bare soil at the construction sites and along the access roads (road D1 and road D11) to minimize dust. - Reduce excavation and filling duration, and excavated soil will be used to fill right after complete work. - Remove soil scattered on the paved road and public road immediately. - Install suitable mufflers on engine exhausts when appropriate.	All construction sites	Beginning of construction (for operating permits of equipment, machines and means) and throughout construction phase	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		- Minimize blowing of horn and comply with speed limits, particularly when going along the sub roads (road D1 and road D11)						
Construction materials transportation, and storage	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	- Arrange reasonable transportation schedule to avoid rush hours to reduce traffic obstacle, the rush hours will be determined on the site since civil work started. - Arrange traffic direction at access roads to ensure project vehicles are not causing congestion. - Ensure vehicles are maintained regularly and require that vehicles and machinery using combustion engines has and maintains valid operating permits throughout the project schedule. The permits shall form part of the bid documents. - Set up construction site regulation for truck drive and provide training for them to increase responsibilities during driving the vehicles. - Place sign boards near construction sites (one warning board at the junction of road D1 and road D11 and one at the junction of Nguyen Huu Canh street and road D1) to direct traffic means to slow down when enter the sub road leading to the construction area. - Rehabilitate any damage to existing roads that may be caused by the	All construction sites.	Throughout construction phase	Monthly		HCMCPMB/ PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		movement of construction vehicles to the site. This will be a condition for the release of the contractor's performance bond. - Arrange waterway transportation schedule to avoid the time of operation of cruise ships, the cruise ships usually travel in the time from early evening to midnight. - Announce the waterway transportation schedule of subproject to owners of cruise ships.						
Excavation and leveling activities	Soil erosion- Increase in the turbidity of surface flow, the loss of soil	- Minimize duration of excavation and leveling by good construction organization to avoid bare land for a long time, to reduce soil erosion and runoff due to rain. - Set up construction schedule so that earthworks will be conducted during dry periods (the dry season runs from December to April in Ho Chi Minh city). - Utilize excavated soil for filling cable trench, foundation pits according to method of balance between excavation and filling. - For excavated soil which cannot be reused, it will be collected and transported to the permitted disposal site for treatment as stipulated at Decision No. 44/2015/QĐ-UBND dated 9 September 2015 of Ho Chi Minh City People's Committee	All construction sites	Throughout construction phase	Monthly	Include in the civil work contract	HCMCPMB / PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		Promulgating regulations on management of sludge in Ho Chi Minh City. - Conduct site cleaning and leveling after construction completion to return the temporary borrowing ground for local community.						
Excavation and construction of substation, Transportation and installation of equipment	Occupational health and safety of workers. Worker injury and health	Occupational Health and Safety Plan (OHSP) will be prepared as part of the CEMP and implemented by the contractor with measures to be applied include: - All construction equipment, tools will be carefully examined for quality and quantity before used. - Contractor need to work with CSC, PIC and HCMCPMB to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment, general safety requirements. - Workers shall be provided with appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc. at no cost to the employee and force them to use. - A first aid kit will be provided at the construction site to ensure patients can receive first aid timely before transporting them to the medical station/hospital.	All construction sites.	Throughout construction phase (fulltime)	Monthly	Include in the civil work contract	HCMCPMB / PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		- Contractors ensure to provide safe drinking water to workers for daily uses. - 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. - The danger areas must have signs. - Safety and fire prevention for the construction area by some simple methods such as water tanks, sand						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		tanks, buckets, shovels, fire ladder. - Contact the local fire protection agencies to take measures to ensure safety in the fire prevention. - 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.						
Excavation and construction of substation, transportation and installation of equipment	Community health and safety - Local people injury and health	Civil contractor will be required to develop a Community Health and Safety Plan (CHSP), as part of the CEMP, that includes: - Install barriers (temporary fence) at construction areas to deter people access to the site; - The local people shall not be allowed to access high-risk areas (excavation sites and areas where heavy equipment is in operation); - Remain the light on during the night time on all construction sites; - Provide warning signs to warn people of danger place; - Assign several security persons on the construction sites; - Periodically check the distance from power equipment to other objects as stipulated. Monitor minimum	All construction sites.	Throughout construction phase (fulltime)	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		approach distances for excavations, tools, vehicles, pruning, and other activities when working.						
Construction of drainage system of rainwater, water pumped from the foundation pits, cable trench	Deposit mud sand; reduce suspended solids in surface rainwater and water pumped from the foundation pits, cable trench; prevent rainwater and water pumped from the foundation pits from overflowing on the ground	- Provide drainage system of rainwater, water pumped from the foundation pits when constructing to prevent standing water and local flooding; deposit mud sand; reduce suspended solids in surface rainwater and water pumped from the foundation pits, cable trench before pumping into environment. - Arrange collection hole of construction wastewater for deposition of SS before wastewater flows into surface water source of Sai Gon river. The detail for technical specification for the hole depends on factual volume of construction wastewater. The common dimensions can be 4m x 2m x 0.5m (length x width x depth). The hole can be placed at the end of water collection ditches in the construction area contiguous to the river corridor. - Dig ditches on the construction site to direct the wastewater flows into sedimentation hole.	All construction sites.	Design and construction phases	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor
Detect cultural and historical properties or values	Avoid damage to cultural and historical properties or values	- Chances of detection of valuable relics and cultural values should be anticipated by contractors. Site supervisors should be on the watch for finds.	All construction sites	At the begging, and throughout construction phase	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
		- 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.						
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	- Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by the subproject construction. - Clear, level and restore the ground after construction completion. Grow trees in temporarily acquired areas.	All construction sites.	throughout construction phase until the project is put into operation.	Monthly	Include in the civil work contract	HCMCPMB/ PIC/ CSC	Contractor
Subproject Operation phase								
The Operation of the substation	Occupational health and safety of the workers. Exposure of workers to hazards due to exposure to live power equipment and high voltage systems, working in heights, fires, explosion, and	- All workers will be required to undergo orientation on security and Environmental Health and Safety procedures and to strictly follow these guidelines when inside the premises. - Only authorized and trained personnel will be allowed to work or have access to electrical equipment. Hire trained and certified workers to install, maintain, or repair electrical equipment. - Adhere to electrical safety standards. - Provide proper grounding and	At the substation	Fulltime	Semiannual	Included in operation and Maintenance cost	The high voltage grid company of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
	potential exposure to EMF.	deactivation of live power equipment during maintenance work or if working in close proximity to equipment. - Provide PPE for workers. - Observe guidelines to minimum approach distances when working around operational equipment. - Identify potential exposure levels in work area including surveys of exposure levels and establish safety zones at the substation. - Post safety reminders and warning signs. - Warn personnel of potential electric arc flash hazards when inspecting or working with energized equipment. - Comply with “Environmental, Health, and Safety Guidelines – Electric Power Transmission and Distribution” (IFC) - Observe compliance with Article 7, Decree 14/2014/NP-CP in terms of number of working time in the substation.						
Operation of the substation	Community Health and Safety. Community risks due to exposure to electrocution hazards, direct	- Provision of warning signs and anti-climbing devices on the substation fence and all towers - Grounding of conducting objects such as fences or other metallic structures near the substation. - Check compliance with	At the substation	Fulltime	Semiannual	Included in operation and Maintenance cost	The high voltage grid company of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
	contact with high voltage electricity, exposure to EMF	"Environmental, Health, and Safety Guidelines – Electric Power Transmission and Distribution" (IFC): Table 1. ICNIRP exposure limits for general public exposure to electric and magnetic fields; - increase awareness of communities close to the substation about hazards of electricity						
Operation of the substation	Generation of hazardous waste. Potential oil spill from maintenance or retrofitting of equipment and accidental spills of hazardous waste may contaminate soil and groundwater.	- Transformers and equipment will comply with the international standards and will not contain PCB. - Provide secondary containment with impervious bund around the transformers and oil storage areas. - Provide a hazardous waste storage area. - Undertake labeling of hazardous wastes. - Register all generated hazardous waste with DoNRE and regularly report storage and disposal measures.	At the substation	Fulltime	Semiannual	Included in operation and Maintenance cost	The high voltage grid company of Ho Chi Minh City	
Operation of the substation	Emergencies and accidents. Possible fire events, explosion of equipment, lighting strikes, damage to cables, and corrosion of	- Install lightning arresters at the substation. - Ensure security of cables and equipment. - Conduct regular inspection of facilities to identify missing or corroded parts. - Implement the fire management program that includes adequate fire	At the substation	Fulltime	Semiannual	Included in operation and Maintenance cost	The high voltage grid company of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[7] (USD)	Responsibility	
							Supervision	Implementation
	equipment may result to emergency situations at the substation	protection equipment, fire suppressants, fire water tank, and fire extinguishers within substations. - Conduct training of workers on emergency preparedness and response procedures.						

CEMP = Construction/Contractor Environmental Management Plan, CSC = Construction Supervision Consultant , DoCST = Department of Culture, Sports and Tourism, DoNRE = Department of Natural Resources and Environment , DPC = Precinct/District People's Committee , EMF = Electromagnetic Field , EMP = Environmental Management Plan, EVNHCMC = Ho Chi Minh City Power Corporation , HCMCPMB = Ho Chi Minh City Power Project Management Board, ICNIRP = International Council on Non-Ionizing Radiation Protection , IEE = Initial Environmental Protection, MONRE = Ministry of Natural and Resources and Environment, PIC = Project Implementation Consultant, PPMB = Power Project Management Board, QCVN = Vietnam Standard , UXO = Unexploded Ordnance

B. Monitoring Plan

161. The environmental monitoring plan for the EMP is provided in Table 17. 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.

162. 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 Government of Viet Nam.

163. After construction is completed the potential impacts of the operation of the subproject will be monitored by EVNHCMC. Regular reporting on the implementation of mitigation measures and on monitoring activities during construction phase of the subproject is required. The mitigation and monitoring plans (Tables 16 and 17) summarize proposed timing of reporting which is on monthly basis. The contractor/CSC has to submit monthly report to the Project owner.

164. Project owner with assistance of PIC compile monthly reports provided by the contractor to prepare semiannual environmental report to submit to ADB.

Table 17. Environmental monitoring plan

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD)
					Supervision	Implementation	
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: 03 positions; one at 180 Nguyen Huu Canh street, one at location of terminal storage, and the other at fence (being constructed) contiguous area with the adjacent residential area. B: 02 positions at Sai Gon river.	Using field and analytical methods regulated in National Technical Regulations (QCVN 05:2013/BTNMT and QCVN 08-MT:2015/BTNMT).	One measurement	Assessment of physical environment included in the IEE	PIC/ESU	Consultant who is preparing the IEE and the subproject	$1,500 (included in consultancy cost).
Construction Phase							
A) Air quality: dust, exhaust and noise B) Affected surface water quality (domestic and construction wastewater) C) Domestic (worker) and construction solid waste inside and outside construction sites including worker camp D) Public comments and complaints E) Incidence of worker or public accident or injury F) Environmental emergency (oil spill, fire, accidents)	A) Construction site; along the access roads (road D1 and road D11) B) Construction site and discharge point C) Construction sites and worker camp D) Using hotline number placed at construction area E) At construction area F) Location of incidence	A-B) Using field and analytical methods approved by DoNRE. 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/ESU F) Using field and analytical methods approved by DoNRE (if applicable).	(A-B): Quarterly during construction period and daily visual records. C)Daily visual records D) Continuous public input E) Continuous F) In case of incidence	Quarterly	(A–B)		
					ESU, CSC, and PIC	Environmental Monitoring Consultant of Contractor	$ 2,000 (included in the construction contracts).
					(C-E) and daily observations		
					EVNHCMC/ESU and CSC, PIC	Contractor	No marginal cost
					(F)		
					EVNHCMC/ESU and CSC, PIC	Contractor	$ 2,000 (included in the construction contracts).

Operation phase							
Incidence of worker accidents, or spills on hazardous materials	At the substation	Regular documentation and reporting	Continuous	Quarterly	EVNHCM		O&M cost
Electromagnetic field monitoring	At the Substation	Equipment for measuring electromagnetic field	Biannual	Biannual	EVNHCM		O&M cost

BTNMT = Ministry of Natural and Resources and Environment, CSC = Construction Supervision Consultant , ESU = Environmental and Social Unit, EVNHCMC = Ho Chi Minh City Power Corporation , IEE = Initial Environmental Examination , O&M = Operation and Management , PIC = Project Implementation Consultant , QCVN = Vietnam Standard

C. Implementation Arrangements

1. Institutional arrangements and responsibilities

165. Responsibilities for implementing the EMP shall be borne by all stakeholders in the project implementation process, including:

- **Ho Chi Minh City Power Corporation (EVNHCMC)** is the Executive Agency which takes ultimate responsibility for overseeing the successful implementation of the environmental safeguards for the subprojects as required by both Viet Nam and the ADB. EVNHCMC reports to the EVN and ADB.
- **Ho Chi Minh City Power Projects Management Board (HCMCPMB)** which is a subsidiary of EVNHCMC is the Implementing Agency of the subproject, and is responsible for the preparation and implementation of the EMP that is prepared for the IEE of the subproject in accordance with the Environmental Assessment and Review Framework (EARF)[13]. HCMCPMB has dedicated 2 personnel for the Environmental and Social Unit (ESU) which is responsible for all environmental and social safeguard activities. HCMCPMB will also be responsible for obtaining any regulatory approvals and maintaining compliance with the Government of Viet Nam's environmental laws as applicable to projects proposed for financing. HCMCPMB will also be responsible for obtaining any regulatory approvals and maintaining compliance with the Government of Viet Nam's environmental laws as applicable to projects proposed for financing.
- **HCMCPMB's Environmental and Social Unit (ESU):** The responsibilities of the ESU include ensuring that the project selection criteria are met in consultation with the IA/EA, preparation of timely IEE document, and that the EMP is implemented successfully. The ESU is responsible to ensure meaningful public consultation is conducted as prescribed by IEE and ADB SPS and the CEMP is prepared by the contractor before the construction starts. The ESU will prepare and submit the REA checklist, and IEE and monitoring reports to ADB for review. The ESU works closely with the PIC to implement the EMP for each non-core project. The ESU also supervises and monitors the preparation and implementation of the CEMP by the environmental officer of the contractor.
- **Construction Supervision Consultant (CSC):** will be an expert with sufficient experience and capacity in social and environment field, he will be signed by the EVNHCMC before beginning construction of the subproject. The responsibilities of this expert is to prepare and implement Environment supervision plan and Environment Monitoring Plan during construction phase, report on any incidents or non-compliances of EMP to HCMCPMB and provide recommendations on EMP performance to HCMCPMB.
- **The Project Implementation Consultant (PIC):** Assist EVNHCMC/HCMCPMB in preparing of IEEs for noncore subprojects and in monitoring and evaluation of safeguards compliance.
- **The Contractor and the Environmental Officer of the Contractor** will prepare CEMP necessary for the implementation of the EMP as required and ensure strict implementation of the mitigation measures outlined in the EMP and the CEMP.
- **Environmental Monitoring Consultant (EMC) of the Contractor:** 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 HCMCPMB's ESU.

[13] Environmental Assessment and Review Framework of Ha Noi and Ho Chi Minh City Power Grid Development Sector Project. December 2013 < https://www.adb.org/projects/documents/ha-noi-and-ho-chi-minh-city-power-grid-development-sector-project-earf >

- **Local governments and communities** are responsible for monitoring the implementation of the EMP as brought forward in the commitment of the Contractor.
- **The Department of Natural Resources and Environment (DoNRE)** is the provincial agency which oversees environmental management of Ho Chi Minh city. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of LEP 2014, EIA, and environmental standards.
- **ADB** will conduct due diligence environmental issues during the project review missions. ADB will review the semi-annual monitoring reports submitted by HCMCPMB and will disclose the reports on its website. If HCMCPMB fails to meet safeguards requirements described in the EMP, ADB will seek corrective measures and advise the HCMCPMB on items in need of follow-up actions.

166. The specific responsibilities of the parties concerned are indicated in the Table 18:

Table 18. Stakeholder's responsibilities

Stakeholder	Responsibilities
Ho Chi Minh City Power Corporation (EVNHCMC)	- General oversight role in the construction phase - Overall responsibility for the implementation of the EMP during operational phase
Ho Chi Minh City Power Projects Management Board (HCMCPMB)	- Establish an Environment Unit led by an Environmental Staff to implement EMP tasks - Manage, implement and supervise the compliance of the EMP and any conditions for approval, including the supervision of construction and operation of all Board staff and Contractor - Evaluate the performance of EMP and conduct revisions, or suspension of operations in cases of violating the conditions of the EMP, which can cause serious impacts on the local community. - Ensure the effective communication and dissemination of content and requirements in EMP to the Contractor. - Assist the Contractor in implementing CEMP and approving the CEMP - Supervise EMP performance - Report EMP performance to EVN, ADB - Prepare summary reports on Project's environmental activities upon request - Brief the Project's information in community meetings - Ensure continuing communication with local communities and fulfil commitments to facilitate for community consultations during project life.
Construction Supervision Consultant (CSC)	- Prepare and implement Environmental Supervision Plan during construction phase - Prepare and implement Environmental Monitoring Plan during construction phase - Report on any incidents or non-compliances of EMP to HCMCPMB
Project Implementation Consultant (PIC)	- Assist EVNHCMC/HCMCPMB for monitoring and evaluation of safeguards compliance - Maintain close coordination with the safeguard team throughout the project life. - Work with ESU to provide education and training for awareness building on safeguards issues - Work with ESU to prepare the semi-annual environmental monitoring report; Assist ESU to guide contractor in CEMP preparation
Contractor and Environmental Officer (EO) of Contractor	- Following the award of the construction contracts, prepare CEMP which details the means by which the contractors will comply with the EMP - Implement mitigation measures in the EMP, keep records and necessary data as required in EMP and submit to CSC - Identify an EO - Ensure that workers are informed of purposes of EMP and aware of necessary measures to implement EMP - Prepare and submit monthly reports on any environmental issue, and on implementation of the CEMP at the construction site.

Stakeholder	Responsibilities
Environmental Monitoring Consultant (EMC) (Hired by contractors)	- Implement the environmental sampling required for monitoring plan of EMP that cannot be conducted by the contractor and HCMCPMB's ESU and environmental officer. - Perform required laboratory analyses for monitoring program detailed in EMP; and - Prepare and submit quarterly reports to HCMCPMB's ESU on monitoring activities.
Local authority and community	- Participate in monitoring EMP implementation

2. Institutional Capacity Review and Needs

167. 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 document for the non-core subprojects. The PIC with assistance from the HCMCPMB's ESU of the subproject will develop and deliver training courses to HCMCPMB staff including the environmental officer of the contractor. The purpose of the course(s) is to strengthen the ability of the subproject owner including the ESU to oversee implementation of the EMP by construction contractors, and EMC. Costs for training will be included in costs for implementation of the EMP.

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

3. Estimated Cost

169. The marginal costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included in the construction costs in contractor bid documents. From Table 17 (Environmental Effect Monitoring) the preliminary cost for the implementation of the EMP for the subproject is summarized in Table 19.

Table 19. Estimated costs for Environmental Monitoring Plan of EMP

Type of activity	Estimated cost (USD)
Pre-Construction phase	
Environmental quality monitoring (baseline sampling program)	$1,500 (Included in the PECC2's consultancy cost)
Construction phase	
Environmental effects monitoring	$2,000 (Included in the construction contract of contractor)
Inspecting environmental compliance	No marginal cost. It will be included in the CSC's contract
Monitoring activities in case of environmental emergency (oil spill, fire, accidents)	$2,000 (Included in the construction contract of contractor)
Operation phase	
Monitoring environmental quality and electromagnetic measurement	No marginal cost. It will be included in the operation and maintenance management cost
Training and capacity development of EVN*HCMC*/HCMCPMB	No marginal cost It is included in the PIC cost

Total	$5,500

170. The cost for EMP is included in working contracts of all working contract of all units.

D. Performance Indicators

171. Performance monitoring (Table 20) is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by EVNHCMC 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 that are summarized in Table 16 and Table 17.

Table 20. Performance Monitoring Indicators for Subproject

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Contract with contractor(s)	Mentioned in Table 16	All environmental mitigation measures mentioned in contractor's bidding documents and contracts in clear manner.	Mitigation measures appended to bidding documents	Bidding documents and contracts
Contract with other entities	Mentioned in Table 16	List of entities and relative contracts	Ensure competent units to participate in the subproject and meet the current stipulations.	Contracts with other entities
Detailed design	Mentioned in Table 16	Mentioned in the detailed design documents	Ensure IEE and EMP included in technical documents in the detailed design phase.	Technical documents
Construction/Contractor Environmental Management Plan (CEMP)	Mentioned in Table 16	Adequacy of CEMPs	CEMPs are available to be implemented in compliance with the requirements of the IEE and EMP	CEMP documents
Land acquisition and compensation	Mentioned in Table 16	Local GOVERNMENT OF VIET NAM's letters for agreement of Subproject land use and assignment of land use right	All procedures for subproject land use and assignment of land use right are completed prior to the subproject implementation.	Resettlement Due Diligence Report
UXO clearance (bombs, mines and other explosives)	Mentioned in Table 16	UXO disarmament	No risk of life safety of workers and people	Monitoring by PIC/HCMCPMB
Construction site arrangement	Mentioned in Table 16	- Disposal plan - Transportation and Traffic Management Plan - location of temporary area for stock pile and material gathering - License for safety and environment ensure of vehicles/machines	By end of pre-construction phase, meeting with contractors to check licenses and observation in the construction site for checking the arrangement	Monitoring by PIC/HCMCPMB
Construction Phase				
Concentration of workers	Mentioned	Hygiene situation,	Rigorous program of	CSC and

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
and domestic wastes generated	in Table 16	availability of appropriate capacity of toilet and waste bins Residential register of workers Rainwater drainage system in worker camp Food safety regulations Educating and training about health and hygiene for workers	procedures to manage worker's camp	contractor monitoring reports
Refused rock and soil, debris, other hazardous wastes generated by soil excavation and filling, construction activities, and equipment installation	Mentioned in Table 16	Solid waste and liquid waste disposal, storage and management 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 hazardous waste from sites practiced.	CSC and contractor monitoring reports,
Construction activities and transportation of materials – Generation of noise, dust and exhausts	Mentioned in table 16	Dust, exhaust and noise are controlled strictly	Complying with mitigation measures for dust, noise and exhausts mentioned in table 16.	CSC and monitoring report of contractors
Construction materials transportation, and storage – Impact on traffic	Mentioned in Table 16	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, CSC reports
Excavation and leveling activities - Soil erosion	Mentioned in Table 16	Excavation, leveling and soil storage is controlled strictly to avoid bare land for long time	Land quality and minimize land slide or erosion	CSC and monitoring report of contractors
Construction and transportation activities - Community and worker safety	Mentioned in Table 16	Frequency of injuries are reduced	Adherence to Government of Viet Nam occupational health and Safety regulations	Contractor reports
Construct drainage system of rainwater, water pumped from the foundation pits	Mentioned in Table 16	Affectivity of drainage system	Minimizing suspended solids in surface water and stagnant water Complying with mitigation measures for water quality mentioned in table 16.	Monitoring by CSC
Detect cultural and historical properties or values	Mentioned in Table 16	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, CSC

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
				reports
Repair, restore, return the ground after construction completion	Mentioned in Table 16	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 CSC monitoring reports
Operation phase of transmission line				
Operation of the substation - Worker and community Safety	Mentioned in Table 16	Frequency of accidents is reduced Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHCMC reports
Operation of the substation - Generation of hazardous waste	Mentioned in Table 16	Frequency of spills Hazardous waste management follow regulations	Prevent spills of oil and hazardous waste and ensure hazardous waste management in compliance with GOVERNMENT OF VIET NAM's regulations	EVNHCMC reports
Operation of the substation - Emergencies and accidents	Mentioned in Table 16	Availability and affectivity of Incident prevention system and emergency preparedness and response procedures	Prevent incident and minimize damage	EVNHCMC reports

XI. CONCLUSIONS AND RECOMMENDATION

172. The initial environmental examination of the 220kV Tan Cang substation subproject in HCMC indicates that main potential environmental impacts are construction-related impacts and that can be mitigated and managed.

173. 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).

174. 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 Physical Cultural Resources components are not identified in pre-construction phase, further detailed EIA of the subproject is not required.

XII. REFERENCES

1) ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.
2) ADB, 2003, Environmental Assessment Guidelines of the Asian Development Bank.
3) ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.
4) General Statistics Office, 2014. HCM city Statistical Yearbook 2014.
5) MOC -Ministry of Construction, 2009. Vietnam building Code 02:2009/BXD.
6) PECC2, 2015. Survey report of the 220kV Tan Cang substation.
7) Technology and Environment Researching Center, 2015. Base Environmental Analysis report.
8) World Bank Group, 2007. Environmental, Health, and Safety Guidelines. Washington DC, 96 pgs.

APPENDICES

Appendix A: Rapid Environmental Assessment (REA) Checklist

Appendix B: Minutes of Public Consultation Meeting

Appendix C: Confirmation Letter of Binh Thanh district on registering the Environmental Protection Plan of 220kV Tan Cang substation

Appendix D: Decision on UXO requirement

Appendix E: Emergency Response Plan

Appendix 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	VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project Subproject: 220kV Tan Cang substation

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	The subproject does not locate in historical and cultural heritage site.
Protected Area		x	There are not any protected areas located near to the subproject location so the subproject will not cause any impacts to these areas.
Wetland		x	Location of the subproject is not in or near to wetland area.
Mangrove		x	Not applicable
Estuarine		x	There are not estuarine in close proximity to the project site. The nearest estuarine area is located 40km away.
Buffer zone of protected area		x	There are no buffer zones of protected areas in close proximity to the project site.
Special area for protecting biodiversity		x	The subproject area and adjacency are not considered as special areas for biodiversity protection.
B. Potential Environmental Impacts Will the Sub-project cause…			
Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	The subproject is not in close proximity to the historical/cultural areas. The Contractors will manage and ban their workers from encroaching into these sites. The Project owner and Contractors will strictly implement mitigation measures in construction phase.

Screening Questions	Yes	No	Remarks
Encroachment on precious ecosystem (e.g. sensitive or protected areas)		x	The project will not encroach on sensitive or protected areas.
Alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		x	The subproject location is adjacent to Sai Gon river bank but no subproject construction work encroach on the river. The river section through the subproject area is protected by stable embankments. Therefore no changes in surface water hydrology will occur.
Damage to sensitive coastal/marine habitats by construction of submarine cables?		x	There is no submarine cable to be installed by the subproject.
Deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		x	Low impact level during construction phase. The overall impact on water quality is assessed to be minor and of short duration and can be mitigated through proper implementation of mitigating measures.
Increased local air pollution due to rock excavation and filling, crushing?		x	Low level. There is no rock crushing, cutting in the project. However, rock is used to mix concrete. 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		Low impact level due to electromagnetic fields in the operation phase. 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 site clearance?		x	No tree or vegetation is in the area for subproject construction.
Noise and vibration due to blasting and other civil works?		x	Minor impact level due to noise and vibration occurred during movement of construction vehicles along access road in construction phase. Mitigations for noise and vibration caused by construction-related activities are specified by the EMP for the subproject.
Dislocation or involuntary resettlement of people?		x	The land use at the area of subproject is composed of no longer used yards of Tan Cang Sai Gon Corporation and public empty land under administration of the State, so no dislocation or involuntary resettlement of people will occur.
Dis-proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	There is no private house and land in the subproject area, so no household will be lost their land or affected by land acquisition of the subproject.
Social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?		x	The location of substation and access road in no longer used yard of Tan Cang port is isolated from existing resident area, so it has no disturbance in local people living by subproject construction. However, a minor inconvenience is caused by subproject transportation along existing streets. The Project owner, Contractors will implement the proposed mitigation measures such as: putting warning signs, scheduling movement of heavy vehicles in proper time, limiting speed of vehicles in crowded areas....
Hazardous driving conditions where construction interferes with pre-existing roads?		x	The roads in the area are already heavily used and increased construction access will be minimal and of short duration.

Screening Questions	Yes	No	Remarks
Creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		x	There are no water pools for a long time by subproject. Site always are cleaned and reinstated after the complete work. This is not considered to be an issue.
Dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		x	Not applicable
Environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?		x	There is no overhead transmission line in the subproject components and no tree in area of the subproject.
Facilitation of access to protected areas in case corridors traverse protected areas?		x	There is no protective area in the subproject area.
Disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		x	No vegetation to be controlled is in the subproject area and no herbicides will be used.
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	Work will be undertaken at the substation with about 80 workers. Workers will be recruited from surrounding communities. There will be limited impact on social infrastructure.
Social conflicts if workers from other regions or countries are hired?		x	The subproject location is in the Ho Chi Minh city where is profuse in both skilled and unskilled labour, so most workers will be hired from surrounding communities. All workers are Vietnamese.
Poor sanitation and solid waste disposal in construction camp and work sites, and possible transmission of communicable diseases from workers to local populations?	x		Moderate impact. The Contractor shall implement measures to ensure hygiene and health of workers and local people, such as providing sanitary accommodation and hiring specialized units to collect waste daily.
Risks to community safety associated with maintenance of lines and related facilities?		x	The risk from operation is rarely happen. A safe plan are prepared and implemented by operation unit.
Community health hazards due to electromagnetic fields, lightning, land subsidence, lowered groundwater table, and sanitization?		x	Minor impact. No land subsidence, lowered groundwater table, and salinization would happen. Electromagnetic fields occur in operation phase. Electromagnetic field of the substation will not affect surrounding communities because the substation fence serves as bounds of 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		There is a slight risk that accidents could happen but it is not expected to be significant. If so, measures will be in place to deal with them.
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the subproject (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		Community safety risks with power lines and substation include unauthorized access. Safety and warning signs will be installed. The substation will have a security fence with anti-climbing devices and full-time security personnel on site. The project is designed to withstand natural hazards and regular maintenance will reduce the risk of major avoidable issues. Decommissioning will not present any unusual hazards.

Appendix B: Minutes of Public Consultation Meeting

Minutes of public consultation meeting on environmental impact assessment, environmental management plan at ward 22, Binh Thanh district, Ho Chi Minh city

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

UBND phường 22, *ngày 9 tháng 03 năm 2016*

BIÊN BẢN THAM VẤN CỘNG ĐỒNG VỀ ĐÁNH GIÁ MÔI TRƯỜNG, KẾ HOẠCH QUẢN LÝ MÔI TRƯỜNG, KẾ HOẠCH TÁI ĐỊNH CƯ

Tiểu dự án: Trạm biến áp 220kV Tân Cảng

Phường 22, quận Bình Thạnh

Thành phố Hồ Chí Minh

I. Thành phần tham dự:

1. Ông (bà): Nguyễn Văn Quang ....chức vụ: PCT UBND P22
2. Ông (bà): Phạm Quốc Việt ....chức vụ: công chức địa chính XD P22
3. Ông (bà): Trần Văn Bay ....chức vụ: Chủ tịch UBMTTQ P.
4. Ông (bà): Nguyễn văn Dụ ....chức vụ: Chủ tịch Hội CCB P
5. Ông (bà): Lê Thị Ngọc Hằng ....chức vụ: Chủ tịch Hội LHPN
6. Ông (bà): Hoàng phú Hiệp ....chức vụ: Bí thư chi đoàn phường
7. Ông (bà): Lê Ngọc Hà ....chức vụ: BCH công đoàn
8. Ông (bà): ....chức vụ: ....

II. Nội dung tham vấn:

- ***Tư vấn thiết kế giới thiệu dự án:*** vị trí dự án, quy mô công suất, tổng diện tích trạm biến áp;
- ***Tư vấn môi trường trình bày:*** chính sách ADB; các quy định về môi trường trong ngành điện của Chính phủ Việt Nam. Các tác động môi trường của dự án và các biện pháp giảm thiểu tương ứng. Cơ chế khiếu nại khi các vấn đề môi trường xảy ra;
- ***Tư vấn xã hội/tái định cư trình bày về:*** Kế hoạch tái định cư của ADB; Những tác động chính khi thu hồi đất và tài sản trên đất; Những chính sách của Chính phủ Việt Nam và địa phương, chính sách của dự án trong vấn đề bồi thường

thiệt hại khi Nhà nước thu hồi; Các tác động thu hồi đất/tái định cư dự kiến trên địa bàn.

III. Ý kiến thảo luận:

3.1 Các vấn đề môi trường tiêu cực và biện pháp giảm thiểu:

Trước khi xây dựng dự án chủ đầu tư cần thông báo cho người dân xung quanh biết kế hoạch thi công.

Vì thế của trạm cần làm ảnh hưởng tới cuộc sinh sống của người dân xung quanh hay không?

Các xe chuyên chở nguyên vật liệu phải đảm bảo vệ sinh môi trường, tránh làm rơi vãi xuống đường gây mất mỹ quan đô thị.

Tại vì thế thì công nhân xây dựng sau khi thi công tránh việc đổ bùn đất xuống sông sau này.

Trước khi thi công chủ đầu tư phải thông báo tiến độ cụ thể với phường. Cần phải cử ra một cán bộ làm tình hình xuyên suốt của dự án để phường tiện liên lạc khi cần thiết.

3.2 Các vấn đề thu hồi đất và tài sản trên đất:

Các thủ tục xin đất và giao đất chủ đầu tư cần làm việc với các ban ngành có thẩm quyền để có cơ sở thực hiện

Vì trái dự án nằm trong khu vực đất công nên không thực hiện bồi thường

Sau khi dự án đi vào vận hành, chủ đầu tư có nghĩa vụ thực hiện việc đóng thuế đất theo quy định

IV. Kết luận:

Chủ đầu tư ghi nhận các ý kiến đóng góp của UBND phường

Đồng nhất với đề xuất và các nội dung đánh giá tác động môi trường của chủ dự án

Đại diện hộ bị ảnh hưởng **Đại diện đơn vị tư vấn** **Đại diện UBND phường**

Trần Văn Bảy

Nguyễn Thị Như Quỳnh

Nguyễn Văn Quang

Tổng Giám đốc XD ĐT MT

Phạm Quốc Việt

Đại diện Chủ đầu tư

Trần Thị Lan Chi

List of participants in public consultation meeting

Location	Meeting date	Number of participants	Number of female participants	Full name	Position
Ward 22	March 9, 2016	7	2	Nguyen Van Quang	Deputy Chairman of ward 22, Binh Thanh district
				Pham Quoc Viet	Cadastral officer
				Tran Van Bay	Chairman of Fatherland Front
				Nguyen Van Du	Chairman of Veterans Organization
				Le Thi Ngoc Huong	Chairman of Vietnam Women's Union
				Hoang Phu Hiep	Communist Youth Union
				Le Ngoc Ha	Trade Union
				Tran Thi Lan Chi	HCMCPMB
				Tran Thi Thuy Duyen	PECC2
				Nguyen Thi Nhu Quynh	PECC2

Some photos of public consultation

Appendix C: Confirmation Letter of Binh Thanh district on registering the Environmental Protection Plan of 220kV Tan Cang substation

ỦY BAN NHÂN DÂN **QUẬN BÌNH THẠNH**	**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM** **Độc lập – Tự do – Hạnh phúc**
Số: 93 /GXN-UBND-TNMT	*Bình Thạnh, ngày 07 tháng 3 năm 2016*

GIẤY XÁC NHẬN ĐĂNG KÝ KẾ HOẠCH BẢO VỆ MÔI TRƯỜNG

Ủy ban nhân dân quận Bình Thạnh xác nhận Ban Quản lý Dự án Lưới điện thành phố Hồ Chí Minh (Tổng Công ty Điện lực thành phố Hồ Chí Minh) đã đăng ký kế hoạch bảo vệ môi trường của dự án "Trạm biến áp 220kV Tân Cảng" tại Phường 22 quận Bình Thạnh tại Ủy ban nhân dân quận Bình Thạnh vào ngày 23 tháng 02 năm 2016.

Ban Quản lý Dự án Lưới điện thành phố Hồ Chí Minh (Tổng Công ty Điện lực thành phố Hồ Chí Minh) có trách nhiệm thực hiện các nội dung sau:

1. Tự chịu trách nhiệm trước pháp luật về thông tin, các biện pháp bảo vệ môi trường đề xuất trong bản kế hoạch bảo vệ môi trường đã đăng ký.

2. Tổ chức thực hiện các biện pháp bảo vệ môi trường theo kế hoạch bảo vệ môi trường đã đăng ký và các trách nhiệm khác theo quy định tại Điều 33 Luật Bảo vệ môi trường năm 2014.

3. Tuyệt đối không sử dụng các loại máy móc, thiết bị, nguyên liệu, nhiên liệu, hóa chất và các vật liệu khác đã bị cấm sử dụng tại Việt Nam theo quy định của pháp luật hiện hành.

4. Phải báo cáo với Ủy ban nhân dân quận Bình Thạnh khi có những thay đổi, điều chỉnh nội dung bản kế hoạch bảo vệ môi trường và chỉ được thực hiện khi có sự chấp nhận bằng văn bản của Ủy ban nhân dân quận Bình Thạnh.

5. Xây dựng các biện pháp xử lý nước thải, khí thải, tiếng ồn, độ rung phát sinh trong quá trình hoạt động của đơn vị trong vòng 6 tháng kể từ khi nhận được giấy xác nhận. Đồng thời, thường xuyên vận hành các hệ thống và đảm bảo trong quá trình hoạt động phải đạt các quy chuẩn kỹ thuật quốc gia về chất lượng không khí xung quanh theo QCVN 05:2013/BTNMT, quy chuẩn kỹ thuật quốc gia về tiếng ồn QCVN 26:2010/BTNMT và quy chuẩn kỹ thuật quốc gia về độ rung QCVN 27:2010/BTNMT, quy chuẩn kỹ thuật quốc gia về nước thải sinh hoạt QCVN 14:2008/BTNMT – Cột B.

6. Thực hiện việc phân loại, lưu giữ và hợp đồng với đơn vị có chức năng để thu gom, vận chuyển xử lý chất thải rắn sinh hoạt và chất thải nguy hại theo đúng quy định.

7. Thực hiện chương trình giám sát môi trường theo nội dung bản kế hoạch bảo vệ môi trường đã được xác nhận. Định kỳ tối thiểu 02 lần/năm báo cáo kết quả giám sát môi trường về cơ quan xác nhận ban kế hoạch bảo vệ môi trường để kiểm tra, giám sát.

Kế hoạch bảo vệ môi trường của dự án "Trạm biến áp 220kV Tân Cảng" tại Phường 22 quận Bình Thạnh kèm theo Giấy xác nhận đăng ký này được cấp cho Ban Quản lý Dự án Lưới điện thành phố Hồ Chí Minh (Tổng Công ty Điện lực thành phố Hồ Chí Minh) để thực hiện và lưu được tại cơ quan Nhà nước để kiểm tra, giám sát./.

***Nơi nhận*:**
- Sở TN&MT;
- CT, P.CT/Q (DA);
- Vp.UBND/Q;
- Phòng TNMT;
- UBND phường 22;
- Ban QLDA Lưới điện;
- Lưu: VT.

TUQ. CHỦ TỊCH
TRƯỞNG PHÒNG TÀI NGUYÊN VÀ MÔI TRƯỜNG

Hồ Kỳ Lân

PEOPLE'S COMMITTEE OF BINH THANH DISTRICT	**SOCIALIST REPUBLIC OF VIETNAM Independence - Freedom - Happiness**
No: 93/GXN-UBND-TNMT	*Binh Thanh, 07th March 2016*

CONFIRMATION IN REGISTRATION OF ENVIRONMENTAL PROTECTION PLAN

People's Committee of Binh Thanh district confirms the Ho Chi Minh City Power Project Management Board (Ho Chi Minh City Power Corporation) has registered the environmental protect plan of the project "220kV Tan Cang substation" in ward 22, Binh Thanh district at People's committee of Binh Thanh district dated 23rd February 2016.

The Ho Chi Minh City Power Project Management Board (Ho Chi Minh City Power Corporation) must be liable for implementing the following contents:

1. To take all responsibilities in front the law in information, environmental protection measures proposed in the registered environmental protection plan.

2. To organize implementation of environmental protection measures according to the registered environmental protection plan and other obligations as stipulated in the Article 33, LEP 2014.

3. Machines, equipment, materials, fuel, chemical and other materials prohibited to use in Vietnam as stipulated by current regulations strictly forbidden.

4. Must report People's committee of Binh Thanh district when the environmental protection plan is changed, modified and these changes are only allowed after People's committee of Binh Thanh district approved by official writing.

5. To set up the measures for treatment of waste water, exhaust air, noise, vibration arisen during operation period of the company within 06 months when receiving this confirmation. Simultaneously, the systems is frequently operated and ensuring that during the operation process it must reach national technical regulation on surrounding air quality according to QCVN 05:2013/BTNMT, national technical regulation on noise QCVN 26:2010/BTNMT and national technical regulation on vibration QCVN 27:2010/BTNMT, national technical regulation on domestic waste water QCVN 14:2008/BTNMT – Column B.

6. To classify, keep and contract with functional units to collect, transport solid waste and hazardous waste for treatment as stipulated.

7. To carry out the environmental supervision program according to contents of the confirmed environmental protection plan. Periodically minimum 02 times/ year, reporting the environmental supervision result to the authority confirming the environmental protection plan for check and supervision.

The environmental protection plan of the project "220kV Tan Cang substation" in ward 22, Binh Thanh district attached with this registered confirmation is issued to the Ho Chi Minh City Power Project Management Board (Ho Chi Minh City Power Corporation) to implement and it is kept at the Governmental authority to check, supervise.

Receiver:
- DONRE;
- Chairman, Vice chairman/District;
- Office of People's committee;
- DONRE of district;
- Ward 22's People's committee;
- Power Network Management Board;
- Filed;

On behalf of People's Committee
Manager of Department of Natural Resources and Environment
(Signed and Stamped)

Ho Ky Lan

Appendix D: Decision on UXO requirement

BỘ TƯ LỆNH QUÂN KHU 7
BỘ TƯ LỆNH
THÀNH PHỐ HỒ CHÍ MINH

Số : 3462/BTL-PTM
V/v xác định tình trạng và sự cần thiết phải rà phá bom mìn, vật liệu nổ còn sót lại sau chiến tranh tại khu vực trạm biến áp 220 kV Tân Cảng.

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc Lập – Tự Do – Hạnh Phúc

Thành phố Hồ Chí Minh, ngày 07 tháng 12 năm 2015

Kính gửi: Công ty cổ phần tư vấn xây dựng điện 2.

Căn cứ công văn số 3459/TV-TLĐ ngày 13 tháng 11 năm 2015 của Công ty cổ phần tư vấn xây dựng điện 2 về việc tình hình bom mìn khu vực trạm biến áp 220 kV Tân Cảng,

Qua công tác theo dõi nắm địa bàn và thực tế thi công dò tìm, xử lý bom, mìn, vật nổ trên địa bàn Thành phố Hồ Chí Minh trong nhiều năm qua, Bộ Tư lệnh Thành phố Hồ Chí Minh có ý kiến như sau:

Vị trí xây dựng công trình nêu trên trong thời gian chiến tranh là nơi thường xuyên xảy ra giao tranh giữa ta và địch, đặc biệt địch đã cho xây dựng nhiều đồn bót, trạm gác là nơi có sử dụng vật cản nổ để bảo vệ.

Vì vậy việc dò tìm, xử lý bom, mìn, vật nổ để đảm bảo cho thi công và khai thác sử dụng công trình trên sau này là cần thiết.

Đề nghị Công ty cổ phần tư vấn xây dựng điện 2 liên hệ các đơn vị có chức năng hoặc liên hệ với Bộ Tư lệnh Thành phố Hồ Chí Minh là đơn vị được Bộ Quốc phòng cấp Giấy phép hành nghề khảo sát, dò tìm, xử lý bom, mìn, vật nổ để thực hiện công tác rà phá bom, mìn theo đúng quy định.

Các đơn vị thi công dò tìm, xử lý bom, mìn, vật nổ phải liên hệ với Bộ Tư lệnh Thành phố Hồ Chí Minh mới được triển khai thi công dò tìm, xử lý bom, mìn, vật nổ khu vực trên, sau khi hoàn thành công việc gửi bản vẽ hoàn công và biên bản nghiệm thu bàn giao về Bộ Tư lệnh Thành phố Hồ Chí Minh (qua Ban Công binh) để theo dõi quản lý./.

Nơi nhận:
- Như trên;
- Lưu: VT, BCB; Đ03

KT. TƯ LỆNH
PHÓ TƯ LỆNH

Đại tá
Nguyễn Văn Hoàng

HIGH COMMAND OF MILITARY ZONE 7

HO CHI MINH CITY HIGH COMMAND

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

No: 2462/BLT-PTM
Sub.: Define situation and necessity of removal of bombs, mines and explosive remained after wars at 220kV Tan Cang substation.

Ho Chi Minh City, 07th December 2015

Respectfully to: Power Engineering Consulting Joint Stock Company 2

Pursuant to the document No. 3459/TV-TLĐ dated 13th November 2015 of Power Engineering Consulting Joint Stock Company 2 regarding situation of bombs, mines at 220kV Tan Cang substation;

Through management of the area and reality of seeking and handling bombs, mines in Ho Chi Minh City during many past years, Ho Chi Minh City High Command would like to advise as follows.

The construction site of the above project during the war period was a place where fought between us and the enemy used to happen, especially our enemy built many military posts, sentry boxes where explosive was used for protection.

Therefore seeking and handling bombs, mines and explosive to ensure construction and operation of the above project is necessary.

Power Engineering Consulting Joint Stock Company 2 is requested to contact with the functional units or Ho Chi Minh City High Command which are the organizations licensed by the Ministry of National Defence in surveying, seeking and handling bombs, mines, explosive to implement the work of removal of bombs and mines as stipulated.

The units carrying out seeking and handling of bombs, mines, explosive must contact with Ho Chi Minh City High Command to start the work of seeking and handling bombs, mines, explosive at the above-mentioned area, after completing the work, the as-build drawing and delivery and acceptance report should be sent to Ho Chi Minh City High Command (through the Engineer Board) for follow-up.

Receiver:
- As ibid;
- Filed;

On behalf of Commander
Deputy Commander
(Signed and Stamp)

Nguyen Van Hoang

Appendix E: Emergency Response Plan

1.The Contractor must develop emergency or incident response procedures (ERP) during construction. In the operational phase the operator/civil authorities will have responsibility for any emergencies or serious incidents. The construction phase will ensure:

- Emergency Response Team (ERT) of the Contractor as initial responder;
- The District fire and police departments, emergency medical service, the Department of Public Health (DPH), collectively referred to as the External Emergency Response Team (EERT), as ultimate responders.

2.The Contractor will provide and sustain the technical requirements, human and financial resources for quick response during construction.

Table 1: Roles and Responsibilities in Emergency Incident Response

Entity	Responsibilities
Contractor Team (CERT)	Communicates /alerts the EERT. Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site. When necessary and requested by the EERT lends support /provides assistance during EERT's response operations.
External Emergency Response Team (EERT)	Solves the emergency/incident
Contractor Resources	Provide and sustain the people, equipment, tools and funds necessary to ensure Subproject's quick response to emergency situations. Maintain good communication lines with the EERT to ensure prompt help response and adequate protection, by keeping them informed of Subproject progress.

3.The CERT will be led by the senior Contractor engineer (designated ERTL) on site with a suitably trained foreman or junior engineer as deputy. Trained first-aiders and security crew will be the core members of the CERT.

4.The Contractor will ensure that CERT members are physically, technically and psychologically fit for their emergency response roles and responsibilities.

5.Prior to the mobilization of civil works, the Contractor, through its Construction Manager, ERTL, in coordination with the PO/PMB, will meet with the ultimate response institutions to discuss the overall construction process, including, but not limited to:

i)Subproject sites;

ii)Construction time frame and phasing;

iii)Any special construction techniques and equipment that will be used;

iv) Any hazardous materials that will be brought to and stored in the construction premise and details on their applications and handling/management system;

v)The Contractor's Emergency Management Plan

vi)Names and contact details of the ERT members

6.The objective of this meeting is to provide the ultimate response institutions the context for:

i)Their comments on the adequacy of the respective Emergency Management Plans.

ii) their own assessment of what types, likely magnitude and likely incidence rate of potential hazards are anticipated.

iii) the arrangements for coordination and collaboration.

7.To ensure effective emergency response, prior to mobilization of civil works, the Contractor will:

i)set up the CERT;

ii)Set up all support equipment and facilities in working condition

iii) Made arrangements with the EERT;

iv) Conduct proper training of CERT members, and encouraged trained volunteers from the labour force;

v) Conduct orientation to all construction workers on the emergency response procedures at grassroots level, particularly evacuation procedures, evacuation routes, among others; and

vi) Conduct drills for different possible situations.

8.To sustain effective emergency response throughout Subproject implementation, an adequate budget shall be provided to sustain the capabilities and efficiency of the emergency response mechanism, the emergency response equipment, tools, facilities and supplies. Drills and reminders will take place regularly, the former at least every two months and the latter at least every month.

Alert Procedures

9.Means of communicating, reporting and alerting an emergency situation may be any combination of the following: i) audible alarm (siren, bell or gong); ii) visual alarm (blinking/rotating red light or orange safety flag); iii) telephone (landline); iv) mobile phone; v) two-way radio; and vi) public address system/loud speakers. Some rules relative to communicating/alerting will be:

(i)Whoever detects an emergency situation first shall immediately:

-call the attention of other people in the emergency site,

-sound the nearest alarm, and/or

-report/communicate the emergency situation to the CERT

(ii) Only the ERT Land, if ERTL is not available, the Deputy ERTL are authorized to communicate with the EERT. Exceptional cases to this rule may be necessary and will be defined in the Emergency Management Plans.

(iii) When communicating/alerting an emergency to the EERT, it is important to provide them with at least: i) the type of emergency situation; ii) correct location of the emergency; ii) estimated magnitude of the situation; iii) estimated persons harmed; iv) time it happened; v) in case of a spill, which hazardous substance spilled; and vi) in case of fire and explosion, what caused it. Such details would allow the EERT to prepare for the appropriate response actions.For an effective reporting/alerting of an emergency situation:

(i) The name and contact details of the relevant persons and institutions will be readily available in, or near to, all forms of communication equipment, and strategically posted (at legible size) in all Subproject sites and vehicles:

-Most relevant construction/operations staffs namely, the ERTL, Deputy ERTL, first-aiders, supervising engineers, foremen.

-EERT institutions/organizations.

-Concerned village authority/ies.

-PMB Office, SS.

(ii) All Subproject sites will have good access to any combination of audible and visual alarms, landline phones, mobile phones and two-way radio communication at all times.

(iii)Contractor's construction vehicles will also be equipped with the appropriate communication facilities.

Emergency Response Situations

The following tables suggest general procedures that will be refined in the final EMP during detailed design, and described in more detail in the Emergency Management Plans of the Contractor.

Table 2: Evacuation Procedure

Procedure	Remarks
Move out as quickly as possible as a group, but avoid panic	All workers/staff,sub-contractors,site visitors to move out, guided by the CERT
Evacuate through the directed evacuation route	The evacuation route shall have been determined fast by the ERTL/Deputy ERTL and immediately communicated to CERT members
Keep moving until every one is safely away from the emergency site and its influence area	A restricted area must be established outside the emergency site, all to stay beyond the restricted area
Once outside, conduct head counts	Foremen to do head counts of their sub-groups;ERTL/Deputy ERTL of the CERT.
Report missing persons to EERT immediately	ERTL/Deputy ERTL to communicate with the EERT
Assist the injured in evacuation and hand them over to the CERT first-aiders or EERT medical group	CERT must manage injured persons to ensure proper handling.
Ifinjurywarrantsspecialcare,DO NOTMOVEthem,unlessnecessary and instructed/directed by the EERT	ERTL/DeputyERTLcommunicates withEERTtoget instructions/directionsinhandlingthe injured.

Table 21: Response Procedure During Medical Emergency

Procedure	Remarks
Administer First Aid regardless of severity immediately.	Fundamentals when giving First Aid: - Safety first of both the rescuer and the victim. - Do not move an injured person unless: - Victimis exposed to more danger when left where they are,e.g., during fire, chemical spill - it would be impossible for EERT to aid victims in their locations, e.g., under a collapsed structure - instructed or directed by the EERT First AID to be conducted only by a person who has been properly trained in giving First Aid.
Call the EERT emergency medical services and/or nearest hospital.	ERTL/Deputy ERTL or authorized on-site emergency communicator
Facilitate leading the EERT to the emergency site	ERTL/Deputy ERTL to instruct: - an CERT member on site to meet EERT in access road/strategic location. He/she shall hold orange safety flag to get their attention and lead them to site. - Other CERT members to clear access road for smooth passage of the EERT
If applicable, vacate site and influence area at once, restrict site, suspend work until	Follow evacuation procedure

further notice.	

Table 4: Response Procedure in Case of Fire

Procedure	Remarks
Alert a fire situation	Who ever detects the fire shall immediately: - call the attention of other people in the site, - sound the nearest alarm, - any CERT member among the construction sub-group contacts the fire department(in this case it should be agreed on that it is alright for any CERT member in the sub-group to alert the fire department) - Report/communicate the emergency situation to the ERTL/Deputy ERTL.
Stop all activities/operations and evacuating	All(non-CERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure
Activate CERT to control fire from spreading	Guided by the training they undertook, CERT members assigned to mitigate the fire shall assess their own safety situation first before attempting to control fire spread
Call the neares fire and police stations, if applicable	When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.
Facilitate leading the EERT to the emergency site	ERTL/Deputy ERTL to instruct: - An CERT member to meet the EERT in the access road or strategic location and lead them to the site.He/she shall hold the orange safety flag to get their attention and lead them to the site. - Some CERT members to control the traffic in the access road to facilitate passage of the EERT in location.
CERT evacuate the site as soon as, if applicable	Follow appropriate evacuation procedure