Initial Environmental Examination

Project Number: 46391-001
February 2017

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

Prepared by Hanoi Power Corporation for the Asian Development Bank.

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LOANS 3161/8286-VIE: HANOI AND HO CHI MINH CITY POWER GRID DEVELOPMENT SECTOR PROJECT

Subproject: 110kV Thanh Cong-Thuong Dinh Underground Cable Transmission Line

Prepared by Hanoi Power Corporation for the Asian Development Bank

CURRENCY EQUIVALENTS

(As of 5 Jan 2017)

Currency Unit	-	Vietnam Dong VND
1.00 VND	=	$ 0.000044
$1,00	=	22.700

ABBREVIATIONS

ADB:	Asian Development Bank
AH:	Affected Household
AP:	Affected people
BOD:	Biochemical Oxygen Demand
CTF:	Clean Technology Fund
COD:	Chemical Oxygen Demand
DARD:	Department of Agriculture and Rural Development
DONRE:	Department of Natural Resources and Environment
DCST:	Department of Culture Sport and Tourism
DOLISA:	Department of Labour Invalids and Social Assistance
EA:	Executing Agency
EIA:	Environment Impact Assessment
EMC:	Environmental Monitoring Consultant
EMP:	Environment Management Plan
EO:	Environmental Officer (of PMB)
ESU:	Environmental and Social Unit
EVN:	Electricity of Viet Nam
EVN HANOI:	Hanoi Power Corporation
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MOLISA	Ministry of Labour Invalids and Social Assistance
MONRE:	Ministry of Natural Resources and Environment
NPA:	National Protected Area
OHL:	Overhead lines
PCB:	Polychlorinated biphenyls
PCR:	Physical Cultural Resources
PIC:	Project Implementation Consultant
PPC:	Provincial Peoples Committee
REA:	Rapid Environment Assessment
ROW:	Right-of-way

PPMB:	Power Project Management Board
TSS:	Total Suspended Solids
UGC:	Underground cable
UXO:	Unexploded Ordnance

WEIGHTS AND MEASURES

km:	kilometer
kg:	kilogram
kV:	kilovolt
ha:	hectare
mm:	millimeter
MV:	medium voltage

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 power infrastructure in Hanoi and Ho Chi Minh City through the rehabilitation and development of 110 kV and 220 kV transmission system and associated substations to supply their medium voltage (MV) distribution system. The Project also strengthens the institutional capacities of Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC) which are responsible for the power supply in their respective areas.

2. The Initial Environmental Examination (IEE) presented herein addresses the expansion of 110kV Thanh Cong-Thuong Dinh underground cable transmission line traversing 6 wards in Dong Da and Thanh Xuan District. This represents one of the non- core subprojects that were identified by Electricity of Viet Nam (EVN) for Hanoi. The IEEs of other non-core subprojects[1] are being prepared separately.

3. EVN HANOI is the executing agency (EA) of the subproject, and the Power Project Management Boards (PPMB) of EVN HANOI is the Implementing Agency (IA) of the subproject.

A. Subproject Summary

4. 110kV Thanh Cong-Thuong Dinh underground cable transmission line subproject is planned to be constructed in Quarter 2, 2017 with two components that are: (1) Thanh Cong-Thuong Dinh underground cable transmission line subproject with length of 3.76 km, which goes through 6 wards of Thanh Xuan and Dong Da District; and (2) expansion of 2 bays in 220 KV Thanh Cong substation. The project will meet the load demand in the area, improve the reliability and flexibility of power supply, and increase the operational safety for Hanoi power grid.

B. Potential Impacts and Mitigation

5. The IEE of 110kV Thanh Cong-Thuong Dinh underground cable transmission line subproject indicates that the potential environmental impacts of the subproject will primarily occur during the construction phase of the subproject components. The common construction-related disturbances such as noise, dust, erosion, sedimentation, solid and liquid waste pollution, worker camp issues, damage to existing roads, increased risk of worker and public injury can be managed with standard construction practices and management guidelines (e.g. the World Bank Group's Environment, Health and Safety Guidelines[2]). There are no rare or endangered wildlife, critical habitat, or protected areas in the subproject sites which are located in developed urban Hanoi.

6. The Subprojects will be implemented in 3 wards of Dong Da District and 3 Wards of Thanh Xuan District. Total permanently acquired land required to build construction is 6,988.5 m^2, including 6,831 m^2 transport land and 157.5 m^2 of public land under management of six wards of Hanoi's two districts. The underground cable construction mainly happens on the road, which should not affect buildings and structures of the households. Therefore there is no demolition and resettlement. The expansion of two outgoing bays at 220kV Thanh Cong substations will demolish substation fence on Hoang Cau Street side with area of 90m^2. This area currently does not have trees, building houses, and inhabited resident. There are no expected negative

[1]The non-core subprojects were developed by EVN to follow implementation of the higher priority core subprojects.
[2]World Bank Group, Environmental, Health, and Safety Guidelines, April 30, 2007, Washington, USA. http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.

induced, or cumulative environmental impacts associated with the subproject objectives of meeting the load demand in the area, improving the reliability and flexibility of power supply, and increasing the operational safety for Hanoi power grid.

7. The Environmental Management Plan (EMP) prepared for the subproject provides a comprehensive impacts mitigation plan, and environmental monitoring plan to minimize and manage the potential impacts of the subproject. The EMP also prescribes an Emergency Response Plan for the construction sites and identifies the need for capacity development and training of the Environmental and Social Unit (ESU) of Implementation Agency (IA) in environmental management and assessment as focused on the implementation of the EMP.

C. Conclusions

8. The IEE concludes that the feasibility design of the 110kV Thanh Cong-Thuong Dinh underground cable transmission line subproject and the 110kV transmission line combined with available information on affected environments is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes to the subproject description do not occur at the detailed design phase and that new sensitive environmental or cultural resources are not determined, further detailed environmental impact assessment (EIA) of the subproject is not required.

II. INTRODUCTION

A. Background to IEE

9. The goal of Hanoi and Ho Chi Minh City Power Grid Development Sector Project is to strengthen the capacity and reliability of the power infrastructure in Hanoi and Ho Chi Minh City through the rehabilitation and development of the 220 kilovolt (kV) and 110 kV high- voltage power transmission systems and associated substations to supply their medium voltage (MV) distribution system. The Project also aims to strengthen the institutional capacities of Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC) that are responsible for the power supply in their respective areas.

10. The Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject will be implemented as part of a sector loan for the overall Project under ADB's Operation Manual Section D3 – Sector Lending. The subproject was selected by EVNHANOI as one of the non-core projects which are being further detailed and prepared for project implementation.

11. EVN HANOI is the executing agency (EA) of the subproject, and the Power Project Management Boards (PPMB) of EVN HANOI is the Implementing Agency (IA) of the subproject.

B. Assessment Context

12. The overall Project was classified as Environmental Category B pursuant to the ADB's Safeguard Policy[3] and recent good practice sourcebook guidance[4]. A category B project will have potential adverse impacts that are less adverse than the impacts of category A project, are site-specific, largely reversible, and can be mitigated with an environmental management plan[5]. The Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject is located in urban areas, low environmental sensitive objects and it is categorized as B under SPS 2009 (refer to REA in Appendix A).The IEE was prepared for the Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject in the feasibility design stage using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

13. The detailed design for the Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject will follow subproject approval. The Environmental Management Plan (EMP) that has been prepared for the subproject will need to be updated where necessary to meet the final detailed designs of the Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject.

[3]ADB, 2009.Safeguard Policy Statement, ADB Policy Paper.
[4]ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.
[5]Footnote 2, pg 19.

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

14. Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by Government Decree No.38/2013/ND-CP which was promulgated on April23 2013, and in accordance with the provisions of for the parent sector project.

A. Viet Nam Regulatory Framework for Environmental Assessment

15. The Viet Nam Law on Environmental Protection (LEP2014)prescribes the requirements for environmental assessment for development and domestic project interventions that affect the natural and social environments; Government Decree No.18/2015/ND-CP on environmental protection master plan, strategic environmental assessment (SEA), environmental impact assessment (EIA), and environmental management plan (EMP) in conjunction with Circular 27/2015/TT-BTNMT dated 29 May 2015 on stipulation of specific articles of Decree No.18 both elaborate the environmental assessment requirements specified by the LEP 2014.

16. The updated screening criteria of Decree No.18 distinguish projects that require an EIA from projects requiring the simpler EMP. The difference between the two processes reflects the level of assessment, and final review and appraisal that is required. At the time of writing, Decree No.18 requires that an EIA be prepared for the Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject.

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

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

a) Environmental Protection regulations

- Law on Environmental Protection by the National Assembly dated23 June 2014 (Law No. 55/2014/QH13);
- Decree No.38/2015/NĐ-CP dated 24 April 2015 of the Government on Management of waste and discarded materials;
- Decree No.18/2015/ND-CP dated 14 February 2015 on environmental protection master plan, strategic environmental assessment, environmental impact assessment and environmental management plan;
- Decree No.19/2015/ND-CP dated 14 February 2015 of the government on detailing the implementation of some Articles of the Law on Environmental Protection;
- Circular No. 32/2013/TT-BTNMT dated 25 October 2013 by Ministry of Natural Resources and Environment promulgating national technical regulations on environment;
- Circular No.36/2015/TT-BTNMT dated 30 June2015 on hazardous waste management;
- Circular No.27/2015/TT-BTNMT dated29 May2015 of the Ministry of Natural Resources and Environment on environmental protection master plan, strategic environmental assessment, environmental impact assessment and environmental management plan.

b) Legal document on electricity

- Electricity Law No. 28/2004/QH11, issued on3 December2004;
- Supplemented Electricity Law No. 24/2012/QH13 by the National Assembly of the Socialist Republic of Vietnam dated 20 November 2012;

- Decree No.14/2014/ND-CP dated 26 February 2014 of the Government detailing the implementation of the Electricity Act on electrical safety;
- Decree No.137/2013/ND-CP of the Government providing detailed regulations for implementation of a number of articles of the Law on Electricity and the Supplemented Law on Electricity;
- Decree No.68/2010/ND-CP dated15 June 2010 of the Government stipulating sanctions in the field of electricity;
- Circular No.31/2014/TT-BCT dated 2 October 2014 issued by the Ministry of Industry and Trade (MOIT) regarding the detailed regulation on some contents of electrical safety.

c) Other related legal documents:

- Decree No.45/2013/ND-CP dated 10 May 2013 of the Government of Viet Nam 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 3 December 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 10 October 2002 regarding the promulgation of 21 labor hygiene standards, 5 principles and 7 labor hygiene measurements.

d) Environmental 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 09-MT:2015/BTNMT - National technical regulation on underground 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.

e) International Guidelines

- The World Bank Group's Environment, Health and Safety Guidelines[6]

[6] Footnote 2

f) Project related Documents

18. The size and location of the construction of Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject basically complies with the approved planning. Specifically, the appropriate planning is reflected in the content of the following documents:

- Document No.4813/SCT of the Department of Industry and Trade dated 19 November 2013 Hanoi on verification of conformity with the electricity planning;
- Decision No.4351/QD-BCT dated 20 August 2011 of the Ministry of Industry and Trade to approve electricity development planning of Hanoi in 2011 - 2015 to 2020;
- Decision No.2143/QD- dated 15 April 2013 of the Hanoi People's Committee on approval of additional "power development planning of Hanoi in 2011-2015, with a vision to 2020".
- Document No.682/QHKT-P7 dated 28 February 2014 of the Department of Planning - Architecture on the direction of Thanh Cong-Thuong Dinh 110kV underground cable transmission line subproject
- Official Letter No.2242/ UBNN-CT dated 31 March 2014 on the direction of the110kV Thanh Cong Thuong Dinh underground cable transmission line and expansion of 220kV Thanh Cong substation.
- Document No.2964 dated 27 August 2013 of the National Transmission Corporation for extension of 2 GIS bays in 220kV Thanh Cong substations.

C. ADB Safeguard Policy

19. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the good safeguard practice sourcebook[7] clarifies the rationale, scope and content of an environmental assessment. Projects are initially screened to determine the level of assessment that is required according to the following three environmental categories (A, B, or C). The Rapid Environmental Assessment (REA) checklist of the subproject is presented in Appendix A.

- 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.

[7] Footnote 4

IV. DESCRIPTIONOF THE SUBPROJECT

20. 110kV Thanh Cong-Thuong Dinh underground cable transmission line subproject is planned to be constructed in Quarter 2, 2017 with two components that are: (1) Thanh Cong-Thuong Dinh underground cable with length of 3.76 km, which goes through 6 wards of Thanh Xuan and Dong Da District; and (2) expansion of 2 bays in 220 KV Thanh Cong substation. The detail description of Subproject components are as follows:

A. 110kV Thanh Cong-Thuong Dinh Underground Cable Transmission line

a) Project Scope

21. 110kV dual circuit Thanh Cong-Thuong Dinh underground cable transmission line is 3.76 km long. It starts from busbar E1.11- 110kV Thanh Cong substations to the end point is busbar E1.5 Thuong Dinh 110kV substations, passing through the territory of 6 wards of 2 districts of Hanoi city. Particularly, it runs through Trung Liet, Thinh Quang, Lang Ha wads- Dong Da District and Nhan Chinh, Thuong Dinh, Ha Dinh wards - Thanh Xuan District- Ha Noi city. The route runs primarily under road surface on the right site. All streets are dense populated with heavy traffic activities. The detail description of underground cable transmission line is presented in Table 1.

Table 1: Description of underground cable transmission line

	Underground section	Length (m)	Description
1	Hoang Cau - Thai Thinh II (Yen Lang Street)	1,070	From 220kV Thanh Cong substation it goes underground route on right path towards Hoang Cau - Thai Thinh II (Yen Lang Street)
2	Nguyen Ngoc Vu - new Dinh Khuong	1,987	After passing Thai Thinh II (Yen Lang Street) the line crosses Lang route, and then crosses To Lich river at the position near Moc bridge. Then it turns left to Nguyen Ngoc Vu street. After passing Nguyen Ngoc Vu,it crosses through Nguyen Trai street, entering new Khuong Dinh street. This segment route goes beneath the road on the left close to the road pavement.
3	The line going on the Khuong Dinh Street	703	After passing new Khuong Dinh street, the route continues into Khuong Dinh street, where the route goes beneath the road, close to the sidewalk to the right, then go into the lane 282 to 110 kV Thuong Dinh substation.

22. These are the main streets, the density of people and vehicles in traffic is very high. The high traffic density time lasts from 6 to 10 pm. The streets are relatively narrow.Cable gland with large angles in turned direction locations: 220kV Thanh Cong substations - Hoang Cau Street, Lang - Moc Bridge - Nguyen Ngoc Vu, and 110kV Thuong Dinh substation's head.

23. The cables crossover the following obstacles:

- Crossover pipe water supply and drainage, power cable: 24 times.
- Cross a street: 1 time
- Cross intersection: 4 times

24. The location of the underground cable transmission line is presented in Figure 1.

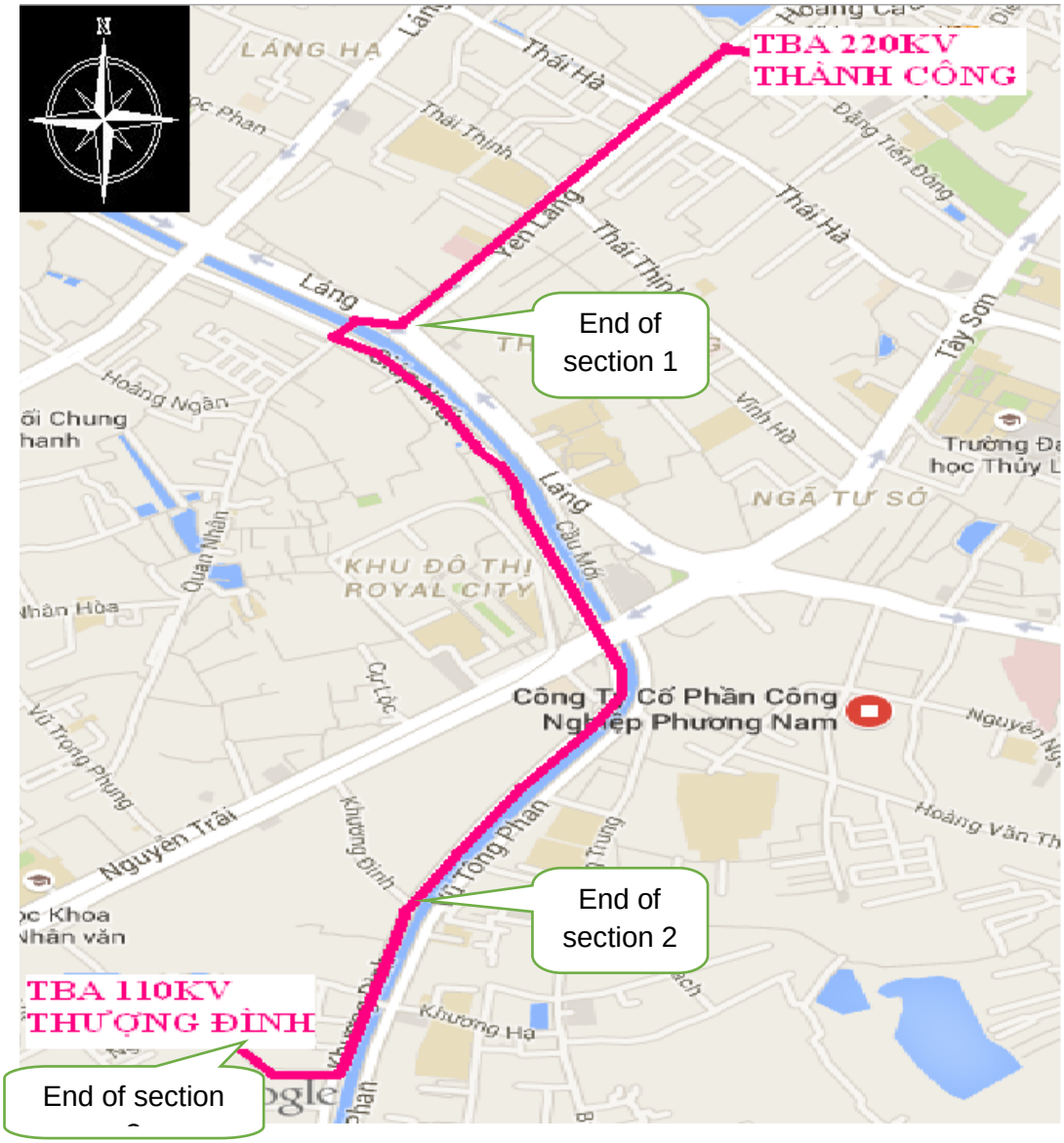

Figure 1: The location of underground cable transmission line

b) Construction methods

25. Due to the complex nature of the cable line which needs to go on existing roads of Dong Da and Thanh Xuan districts, this subproject will combine two cable installation options for the entire route:

- Option 1: Cable is placed in concrete, reinforced (tunnel) ditches
- Option 2: Cable is placed inside HDPE pipe then buried in the ground (cable trench) across the entire line. Cables can be arranged in two ways: vertically and horizontally (Figure 2)

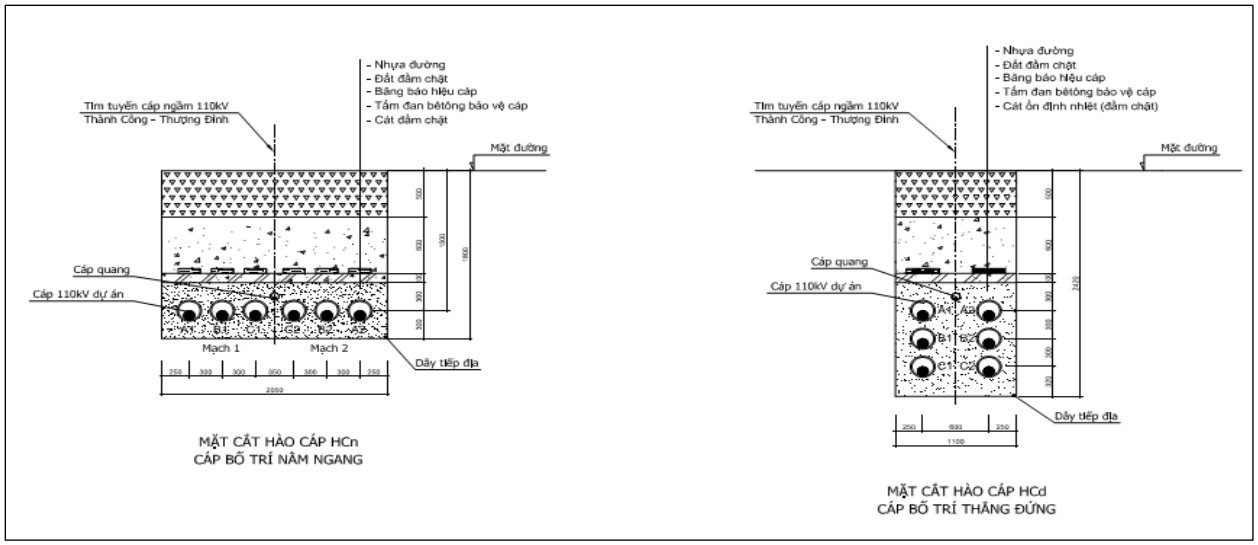

Figure 2: Layout of underground cable distribution in cable trench

(Right site: horizontal distribution and left site: vertical distribution)

i. Construction of normal trench system:

26. For the underground cable section under road, construction measure is mainly by hand, and partly by machine for promoting construction process. At the locations there are many underground works of electric cable, water pipe, telephone line, fibber cable, drainage system, public lighting cables, water supply and drainage pipes of residents, the underground cable construction should be manually conducted to avoid damages to these existing underground works (if any) and ensure occupational safety. Construction should be implemented by rolling type with each 30-50m segment, and at night to avoid affecting to the traffic activities.

27. Construction method includes cable trench excavation, cable pull and scatter, and initial status recovery of cable trench. Cable trench section beneath the road is a rectangular outer dimension 2.05x1.8m (cable horizontal layout) and 1.1x2.42m (cable vertical layout). Structural cable trench from the top down as follows: asphalt and gravel roadbed 600mm thick; natural land 500mm thick compacted, then a layer of cable signals mesh; 100mm thick concrete cable protection layer. The sequence steps are:

- Cable is placed in the trench cable systems across the entire line.
- Organize the site layout and traffic management properly. Put signage system and signboards under construction requirements.
- Cut the road surface, the size in accordance with the cable buried trench. After using cutters for cutting road at two edges of cable trench, excavators will be used to excavate road surface and foundation.
- Drive piles or formwork to reinforce cable trench wall in order to prevent surrounding landslide in the cable trench.
- Use a trenching machine to the specified depth. Where it cannot use excavators, dug manually.
- Pour concrete for the cable trench.
- Place the tube for optical fibber and finish in accordance with design drawings.

- Reconstruct the road surface to ensure the normal circulation. Mark cardiac cables.
- Excavated soil and asphalt are poured and transported by 12 tons truck to the disposal sites. Truck body should be covered tightly to avoid soil droppings, ensuring environmental sanitation. Transport distance is expected to be 10 km.

28. When construction is conducted at night, electric light will be hung along two edges of the cable trench and signal lights with each 10 ÷ 15 m.

29. During as well as after excavation, if it rains or groundwater filled up, pumps shall be used to pump water out from the cable trench. Pumps should be placed in the lowest position of the dug cable trench. It could also create grooves, holes for draining and pumping water from the cable trench.

ii. Construction of cable trench crossover underground works:

30. At the crossover position with the underground works, basically trench system is as in the normal sections. So, the construction steps are also conducted similar.

- For the crossover position with drainage works, the temporarily reinforced system against collapse sewer will be used. After digging trenches, pouring casting cable protection systems in accordance with design drawings, conduct backfilled immediately, restore the road surface to avoid erosion and land collapse of drainage system.
- Excavated soil to be transported to the regulated site; clean up the construction site to ensure the temporary traffic returned to normal.
- After completion of the underground cable installation and excavation, the cable trench will be filled and recovered into initial status in time, avoid keeping open cable trench too long. This can cause landslide of the cable trench wall and endangerment for travellers, especially for the underground cable section crossing the underground drainage systems.

iii. Construction of section crossovers special locations

31. Construction sequence and some special attention when handling crossover special locations are described as follows:

* *Construction of section crosses over underground sewers in Hoang Cau Street and intersection locations*:
  - Organize the site layout and traffic management properly. Put signage system and signboards under construction requirements.
  - Excavate and reinforce construction work
  - Pour the concrete protective layer M200.
  - Put HDPE pipe and positioning
  - Pour concrete protection M200 layer covering the HDPE pipe.
  - Earthworks, excavation and refunded pavement, waste soil and stone clean up.

* Handling cross-intersection locations:
  - Comply with the contents of the license and the provisions of law on construction.
  - Must have construction plans and construction time appropriate to the characteristics of each location to avoid cause traffic jams.

- During the construction process, contractor must be arranged signal, temporary fencing at construction and implementation of measures to ensure smooth traffic and safety.
- Construction organization under each the lane to avoid disrupting traffic.
- Construction on the hour with low traffic volume (etc., at night).
- Pilling Lasen protection against erosion.
- Excavating and reinforcing construction.
- Concreting and lining the bottom of cable protection.
- Instillation and positioning HDPE pipe.
- Pouring concrete covered cable protection HDPE pipe.

* Dismantling Lasen pile.

- Earthworks, excavation and return to its original pavement.
- The contractor shall coordinate closely with contractors who construct Le Van Luong street to ditch cable line construction on Le Van Luong street for to avoid overlapping excavation.

B. Two New Feeder Bays in Thanh Cong 220kV Substation

a) Project Scope

32. The Technical specification/equipment for installation of two new feeder bays in Thanh Cong 220kV Substation located in Lang Ha ward is presented as below:

- Install new switch gear 110kV GIS for 2 bays going to Thuong Dinh substation;
- Equip new protective control equipment for substation extension area;
- Extend 110kV GIS room for 2.4 m to Hoang Cau Street to install two 110 kV bays going to Thuong Dinh substation;
- Add contacts beams, foundations serving the renovated rooms 110kV GIS;
- Expand 220kV substation fence and gates from old fence Success 3.5m into the Hoang Cau, extending 157,5 m^2 area;
- Upgrade 110kV GIS room and increase Thuong Dinh substation area for 157.5 m^2 more.

b) Construction method of 2 new feeder bays

- Demolition of the existing fence at Hoang Cau street site and build a new fence gate3.5 m apart from the old fence;
- Breaking down the walls between GIS room and outer area, transfer wall and doors to new position 2.4 m from the old location;
- Extend the axial beam B, and C address associated with the new column 1A shaft. Expand the floor, roof GIS department linked to the new structure 1A shaft;
- Pierce technical cabling holes on the floor for installation of the new machine;
- Extend the crane beams associated with the new column 1A axis, linking welding to existing crane beams.

C. Supply of materials and construction machinery

33. The volume of excavated/filed soil and construction materials will be needed during the construction phase are presented in Table 2

Table 2: The volume of excavated/filed soil and construction materials

No.	Soil amount and construction materials	Unit	Quantity
1	Excavated soil	m^3	2,940.53
2	Filled soil	m^3	2,215.5
3	Reinforced steel	Ton	295.916
4	Hi Density Polyethylene (HDPE) pipe	Ton	35.1
5	Concrete	Ton	775.236
6	Asphaltic concrete	Ton	513.427
7	Cement	Ton	67.85
8	Sand	Ton	52.344
9	Welding rod	Ton	0.02

(Source: Project Justification*)*

34. As the project is to be implemented in the area of the city of Hanoi, where most of the raw materials can be found. Therefore, primary materials such as stone, cement, iron and steel etc. will be bought in Hanoi and surrounding provinces, for examples:

- Iron and steel provided by supplying contractors;
- Cement, sand and gravel bought at local businesses;
- Porcelain insulators and accessories imported by supplying contractor;
- Raw materials are transported by 3.5-16 tons trucks to store houses of contractors and then to construction site by wheel barrows.
- The transformers are shipped from providers to the project site by over-gauge vehicles (OGV), under the technical requirements stated by the manufacturer.

35. The construction equipment will be mobilised to the sites which could be listed in Table 3. This equipment must be in the registry and the validity period.

Table 3: Machines used for the subproject

No	Machine type	Quantity
1	Truck	3
2	Roller tractor	1
3	Winch	1
4	Threaded cable machine	2
5	Diesel hammer	1
6	Bending mowers	2
7	Water pump	2
8	Air Compressor	1
9	Welder	2

No	Machine type	Quantity
10	Electric drill	1
11	Asphalt Cutting Machine	4

(Source: subproject justification)

D. Waste treatment

36. Domestic solid waste: number of construction workers for the underground cable is 25 people, the total solid waste generated per day is about 12.5 kg

37. Since the construction subproject is in a very crowded area, a place for worker camp is not available. The workers will be proposed to hire local resident's houses for staying, domestic solid waste generated by workers' living activities will be collected into dustbins and disposed at local regulated site.

38. The subproject construction solid waste such as remained soil (1,148.742 ton), waste rock (507.375 ton), asphalt concrete (621.058ton) and broken bricks (24.833 tons) (source: Vietnamese EIA report) will be transported by trucks to the Lien Ha waste dump, Dan Phuong district, Hanoi city, which is about 19 km from the project. The agreement/licence for disposal will be obtained by contractor before the construction starts. Other construction waste like cement bags, clouts etc. will be sorted for reuse. The management of construction solid waste is presented in Figure 3.

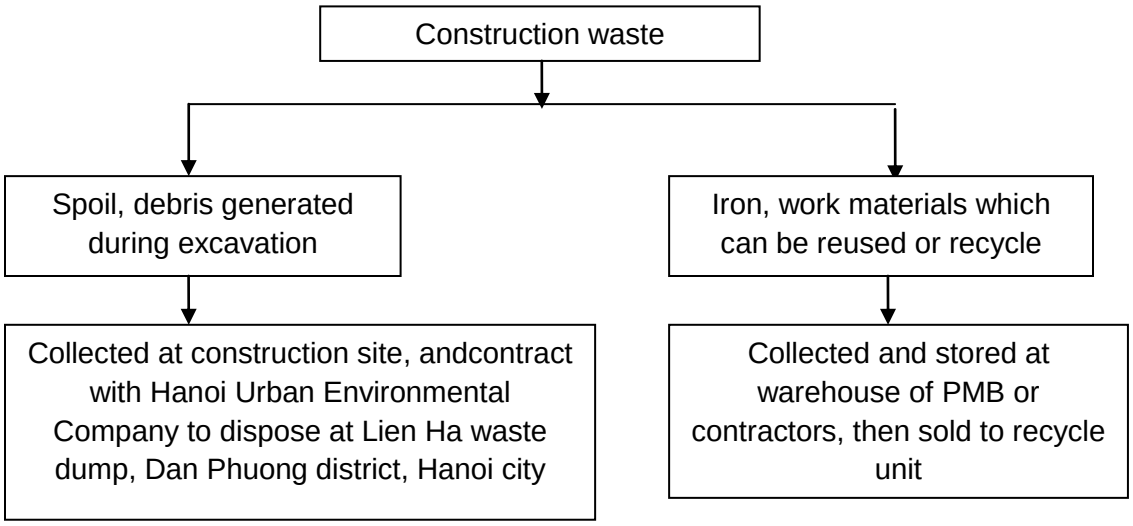

Figure 3: Management of construction waste

V. DESCRIPTIONOFTHE EXISTINGENVIRONMENT (BASELINE DATA)

39. The environmental baseline information was obtained primarily from Hanoi Statistical Yearbooks, reports from EVN's technical consultant, and other environmental assessments conducted for the project area. The description of the affected environment focuses on natural features and land use.

A. Physical Environment

Climate

a) Temperature

40. The climate of project area in Hanoi Capital is under the influence of the Northern region characterized by humid tropical monsoon, that is, hot and rainy in summer, and cold and cloudless in winter. From May to October, hot and humid climate is dominant with the average temperature of 28.4^{o}C. From November to April of the following year, cold climate is seen with average temperature of 20.1^{o}C. The values of the average temperature from 2009 to 2013 are shown inTable 4.

Table 4: Monthly average temperature from 2009 to 2013 (^{o}C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year avg.
2009	15.4	22.0	20.6	24.1	26.4	29.6	29.1	29.2	28.3	25.9	21.2	19.5	24.3
2010	18.1	20.9	21.9	23.5	28.7	30.9	30.7	28.6	28.6	25.7	22.1	19.4	24.9
2011	12.8	17.7	17.1	23.8	27.2	29.5	29.9	28.9	27.6	24.5	23.8	17.4	23.4
2012	14.6	16.2	20.2	26.2	28.9	30.3	29.6	29.3	28.0	26.8	23.4	18.7	24.4
2013	15.3	19.9	24.0	25.0	28.9	30.0	28.7	29.1	27.0	25.6	22.8	16.3	24.4
Avg.	15.2	19.3	20.8	24.5	28.0	30.1	29.6	29.0	27.9	25.7	22.7	18.3	24.3

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013.)

b) Rainfall and Humidity

41. The rainy season in Hanoi area occurs in the period from May to October. Months with the largest rainfall are usually July or August associated with tropical storm season in the Red River Delta. The smallest monthly rainfall is in February. The average rainfall from year to year is 1,639.9mm. The largest monthly rainfall is 541.4mm in 2009-2013 periods (appearing in Aug 2013). Monthly and yearly rainfall average is shown in Table 5.

Table 5: Monthly rainfall in Hanoi (mm)

YM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	4.5	6.5	36.5	54.5	234.5	232.5	505.0	95.0	179.5	78.0	0.5	0.0	1,427.0
2010	80.9	8.1	5.8	55.6	149.7	175.4	280.4	274.4	171.8	24.9	0.6	11.6	1,239.2
2011	9.3	17.5	105.9	42.0	149.0	388.3	255.3	313.2	247.3	177.6	31.8	51.5	1,788.7
2012	20.3	16.5	16.9	31.8	386.7	268.9	388.3	487.8	54.7	77.5	34.8	25.7	1,809.9
2013	13.9	17.6	46.1	23.3	242.5	216.7	305.9	541.4	374.3	61.2	69.6	22.3	1,934.8
Avg.	25.8	13.2	42.2	41.4	232.5	256.4	347.0	342.4	205.5	83.8	27.5	22.2	1,639.9

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013).

42. Humidity in this area is subject to seasonal variations; the highest values are in February and March when they can reach 90%. The lowest humidity, from November to January, is from 77% to 81%. The average moisture in the project area during the period from 2009 to 2013 was

79%. The average values of the monthly and yearly humidity during the period from 2009 to 2013 are shown inTable 6.

Table 6: Average Relative Humidity in months (%)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Avg.
2009	77	88	86	86	86	80	84	84	83	82	71	78	82
2010	81	80	78	85	81	74	74	82	79	70	71	77	78
2011	71	83	81	80	76	80	78	81	81	79	77	68	78
2012	83	83	83	80	76	80	78	81	81	79	77	68	78
2013	82	86	80	81	80	74	83	81	82	73	73	68	79
Avg.	79	84	82	82	80	78	79	82	81	77	74	72	79

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013).

c) Wind direction

43. Hanoi is located in the monsoon influenced area. In summer,south-easterly monsoon winds are prevailing with frequency from 41.5% to 57.5%, bringing cool and moist air from the Pacific Ocean. Prevailing in winter are northeast monsoon winds with the frequency 28.6% to 29.8%; dry in the early season and wet in the end. In winter South-eastern monsoon appears with frequency of 28.3%, creating a pleasant weather. In addition, Hanoi summer is also affected by hot dry west monsoon with lesser frequency.

44. The northeast monsoon is the one with thunderstorms that can create a wind pressure of 95daN/m^2 and wind speed can reach up to 40m/s.

d) Sunlight hours

45. The total number of average hours of sunlight measured in 5 years, from 2009 to 2013, is 1,191.2 hours/year. The sunlight regime is closely related to the radiation and cloudiness status. From December to April due to the cloudy weather,the number of sunshine hours is as few as 5 hours, and a monthly average of only 70.0 hours. From May the sunshine hours rise up to 131.7 hours/month. The duration of sunlight in year is shown inTable 7.

Table 7: Yearly and monthly sunlight hours from 2009 to 2013 (hrs)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	96.8	0.0	45.2	97.6	143.6	168.3	161.9	202.4	139.8	126.4	141.4	67.1	1,390.5
2010	32.8	93.6	50.7	48.3	130.8	159.2	180.1	120.8	145.0	102.3	103.1	78.6	1,245.3
2011	3.7	38.5	15.2	56.0	141.2	126.1	149.9	150.1	102.4	72.6	104.6	95.0	1,055.3
2012	4.5	21.0	23.8	88.7	146.2	106.9	142.2	159.2	109.6	98.2	92.2	40.4	1,032.9
2013	12.2	38.2	74.3	69.4	156.3	158.7	118.8	139.0	92.8	140.1	76.0	156.3	1,232.1
Avg.	30	38.3	41.8	72	143.6	143.8	150.6	154.3	117.9	107.9	103.5	87.5	1,191.2

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013)

e) Thunderstorms

46. Located in a storm prone area, the subproject is directly affected by storms and thunderstorms. Storm season lasts from June to September, with 1-2 storms per year of 12 level intensity and strong gales. During storms, wind speed may exceed level 12 (corresponding to 20-year cycle). The storm rainfall can reach from 100 to 500 mm, or 1000mm at times.

47. Regarding thunderstorms, the number of thunderstorm days on average is about 51 days, i.e., an average of 219.1 hours. The average thunder density is 6.47; the peak month of thunderstorm is August.

Air quality and Noise

48. To analyse the air quality at the subproject area, 07 air samples were taken and analysed by the EIA preparation team (Physical Institute - Vietnam Academy of Science and Technology). The sampling and direct measurement time was taken from 7.30 - 16.30 on 06 May 2015. The air (KK) and surface water (NM) sampling and measuring locations are presented inFigure 4. The detail description of air sampling locations is presented inTable 8.

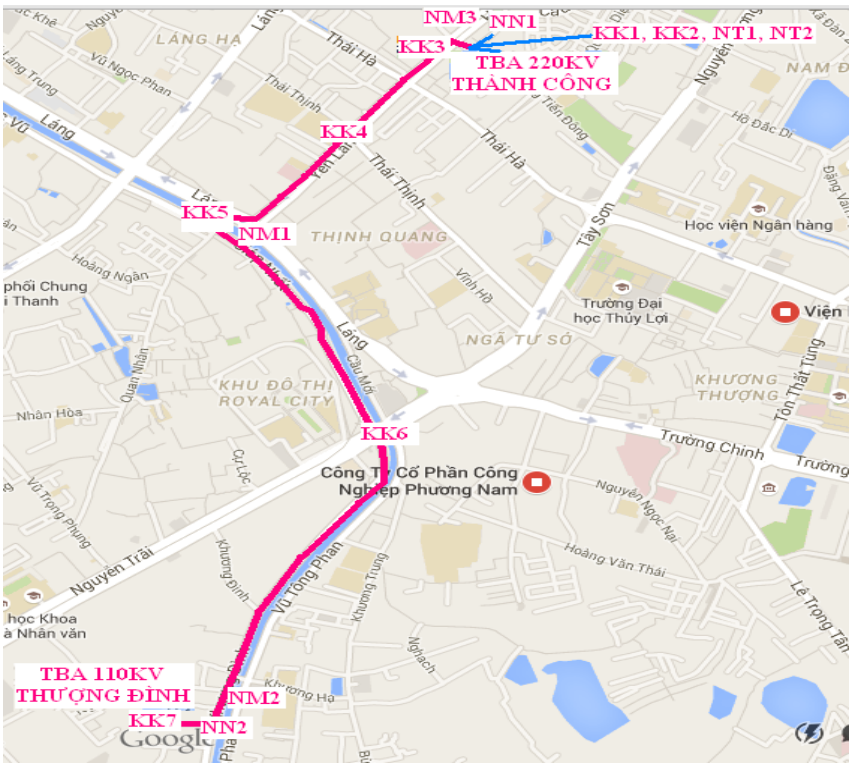

Figure 4: The air and surface water sampling and measuring locations

Table 8: The description of air sampling and measuring locations

No.	Code	Location	Coordinates
1	KK1	At locations of transformers AT4 and AT5 – Thanh Cong Substation	N: $21^0$02’206” E: $105^0$55’248”
2	KK2	At Gate of 220kV Thanh Cong Substation	N: $21^0$02’092” E: $105^0$55’155”
3	KK3	Along the underground cable in Hoang Cau street, at the section opposite of 220kV Thanh Cong substation	N: $21^0$00’921” E: $105^0$49’214”
4	KK4	At the intersection of Yen Lang and Thai Thinh Streets, opposite the Thai Thinh primary school gate	N: $21^0$00’720” E: $105^0$49’023”
5	KK5	Along the underground cable, at Moc bridge	N: $21^0$00’544” E: $105^0$48’816”
6	KK6	Along the underground cable, at Moi bridge-Nga Tu So	N: $21^0$00’102” E: $105^0$49’064”
7	KK7	At Gate of 220kV Thuong Dinh Substation	N: $20^0$59’468” E: $105^0$48’727”

(*Source, EIA report, 2015*)

49. The results of analysis of air quality and working environment of the subproject area, which were taken on 6 May 2015,are presented inTable 9.

Table 9: The results of analysis of environmental air quality and noise at the subproject area

TT	Parameters	Unit	Analysed results						QCVN05:2013/BTNMT(average one hour)
			KK2	KK3	KK4	KK5	KK6	KK7	
1	Temperature	^{0}C	31.7	31.9	31.9	32.4	32.4	32.3	-
2	Humidity	%	68	69	69	68	68	68	-
3	Wind velocity	m/s	1.1	1.3	1.2	0.9	1.1	1.3	-
4	Wind direction	-	ĐN	ĐN	ĐN	ĐN	ĐN	ĐN	-
5	Pressure	mmHg	760	760	760	760	760	760	-
6	Total dust particles	µg/m^3	252	**371**	**392**	**393**	**368**	241	300
7	SO_2	µg/m^3	337	**390**	**399**	337	**443**	266	350
8	CO	µg/m^3	6,700	13,070	14,260	14,250	16,260	8,247	30,000
9	NO_2	µg/m^3	148	**224**	**259**	**245**	**292**	**203**	200
10	Noise level	dBA	66.8	**73.9**	**74.2**	**72.9**	**75.8**	67.4	**70(*)**
11	Electromagnetic field intensity	kV/m	1.1	KPH	KPH	KPH	KPH	1.5	-
12	Electric field intensity	A/m	25	KPH	KPH	KPH	KPH	24.6	160(**)

(*Source, EIA report, 2015*)

Note: (-) Not regulated; KPH: Not detected
(*): QCVN 26:2010/BTNMT: National technical regulations on noise level;
(**):Decision No. 3733:2002/BYT (average one hour)
QCVN 05:2013/BTNMT: National technical regulations on ambient air quality.

50. The results show that concentrations of some parameters such as dust, SO_2, NO_2 are exceeded permissible limits of QCVN 05: 2013/BTNMT. The reasons could be explained that the sampling locations were located on the main traffic roads with heavy traffic density such as Nguyen Trai,Lang, Hoang Cau, Khuong Dinh streets and the monitoring results could be strongly affected by traffic activities.Therefore, the appropriate construction must take measures to limit cumulative impact.

Topography, Geography and Soil

a) Topography

51. The subproject is located in the area of Trung Liet, Lang Ha, Thinh Quang Wards of Dong Da district, and Thuong Dinh, Ha Dinh, Nhan Chinh wards of Thanh Xuan District, Hanoi city. The topography of those wards is similar. Located in central North Delta terrain the topography of those wards are characterized by low plains, valleys, with absolute height varies between 5 - 6 m and they are separated by rivers, canals and lakes.

b) Geography

52. The subproject area is located along streets with crowded residential area. Based on the survey results and exploration data of design consultants, pursuant to the document, "Report of the geological characteristics of Hanoi region during the period from 2005 to 2010 and forecasts

to 2020" by the Institute of Geophysics - Vietnam Academy of Science and Technology, 2012, the geographical features of the subproject areas are described as follows:

- Le Chi Formation (QIIc): composition of sand, pebbles, gravel, grit mixed with 35-70cm thick gray sand powder
- Hanoi Formation (QII-IIIhn): Composition of pebbles, gravel, grit, quartz gravel, clay alternating yellow powder thickness 2-20 m
- Vinh Phuc Formation (QIIIvp): little gravel sand, clay powder patchy colourer grey silty clay, 5-20 m thick
- Hai Hung Formation (Q1-2IVhh): Sand, dough, clay, yellow gray (am), powdered clay, dark grey, grey ash (mb) dust sand, dark grey powder sand, black and green clay, kaolin clay and the remains of plants, 2-10 m thick
- Thai Binh Formation (Q3IVtb): Composition of clay, dough, sand gray brown (am), sand, flour, dark grey clay (bm), brown clay alternating black clay containing vegetation remnants, grey, fine-grained sand, sand granules 1-5 m thick
- Undivided Quaternary System (Q): Composition of grit, funerals, 1-5m thick clay dough.

53. The Geological structure along the line in order from top to bottom is as follows:

- Clay layer - alQ4: (Grade 11): Clay brown, light brown, soft plastic state to hard plastic. The average thickness is of 1.4 m
- Clay layer - almQ4: (Grade 9): Clay brown, golden brown, yellow, red, variegated color, status to hard plastic. The average thickness is of 2.4m.
- Clay layer - almQ4: (layer 11a): Clay brown, brown pink, sandwiched sand circuit, soft plastic state.

54. The summary of physical criteria of soil layers is presented in Table .

Table 10: The summary of physical criteria of soil classes

No.	Criteria	Symbol	unit	Layer 11	Layer 9	Layer 11a
1	Natural Humidity	w	%	24.3	30.2	28.6
2	Natural weight	γ_O	g/cm^3	1.98	1.90	1.89
3	Specific weight	ρ	g/cm^3	2.73	2.71	2.71
5	Feel	B		0.47	0.15	0.53
6	Saturation degree	G	%	93	95	91
7	Plasticity index	W_n	%	12.4	22.3	14.4
8	Empty coefficients	ε_0		0.714	0.855	0.847
9	Subsidence compression ratio	a_{1-2}	cm^2/daN	0.029	0.022	0.048
10	Adhesive force	C	daN/cm^2	0.23	0.29	0.21
11	Friction angle	φ	(^{0})	15	18	12
12	Deformation module	E	daN/cm^2	138	195	74

(Source: Subproject justification document)

c) Soil quality

To assess the soil quality in the subproject area, three soil samples have been taken on May 2015 (

55. Table).

Table 11: Locations for soil sampling

No.	Code	Location	Coordinates
1	D1	In the area extending 2 new bus bar, bordering the GIS room	E: $105^0$39’830” N: $20^0$56’047”
2	D2	Along underground cable line, at Lich river shore, near the location crossing Nguyen Trai road	E: $105^0$33’996” N: $20^0$56’110”
3	D3	At the Lich River shore, where river cross Lang road, near the Moc drain bridge	E: $105^0$36’566” N: $20^0$56’726”

(Source, EIA report, 2015)

56. The analysed results of soil quality in the subproject site are presented inTable . It is found that all soil analysis values are within the limits allowed by QCVN 03:2015/BTNMT. Parameter of plant protection drug residues in soil samples has been found in very small quantities or not detected.

Table 12: Analysis of soil quality in the subproject site on May 2015

No.	Parameter	Unit	Results			QCVN 03:2015/BTNMT (Industrial soil)
			Đ1	Đ2	Đ3	
1	Zn	mg/kg dry soil	71.5	72.7	80.1	300
2	Pb	mg/kg dry soil	31.2	31.6	31.8	300
3	As	mg/kg dry soil	3.09	3.11	3.02	25
4	Cu	mg/kg dry soil	18.4	18.1	18.5	300
5	Cd	mg/kg dry soil	0.02	0.01	0.02	10
6	Lindane	mg/kg dry soil	KPH	KPH	KPH	0.01(*)
7	Aldrin	mg/kg dry soil	KPH	KPH	KPH	0.01(*)
8	Dieldrin	mg/kg dry soil	KPH	KPH	KPH	0.01(*)
9	DDT	mg/kg dry soil	KPH	KPH	KPH	0.01(*)
10	Endrin	mg/kg dry soil	KPH	KPH	KPH	0.01(*)
11	Heptachlor	mg/kg dry soil	KPH	KPH	KPH	0.01(*)

(Source, EIA report, 2015)

Note:

"-": No specified; KPH: Not found;

QCVN 03: 2015/BTNMT- National Technical standards on permissible limits of heavy metals in soil.

Surface water/groundwater resources and quality

a) Surface water

57. The project has a common area and hydrological conditions of Hanoi, affected by hydrological regime of the Red River and To Lich River.

58. The Red River flows from north to south with average flow rate per year of about 2,710m^3/s. The lowest flow in the dry season is 1,870 m^3/s. The average flow rate during the rainy season is 8,000 m^3/s. The biggest flow is 18,000 m^3/s. The average water level is 9.75m high, fluctuating every year, especially in the rainy season, with the sudden flood, water raises rapidly, sometimes up to 3 m during 24 hours. Typical hydrological flow of the Red River flows through Hanoi's having annual average flow Qo = 2,650 m^3/s, dispersion coefficient Cv = 0.14, the coefficient of bias Cs = 0.8.During the dry season, the Red river system is the water source for agricultural land on both sides. With high silt content, the maximum can be up to 14kg/m^3, a large number of sediment (80 million m^3 per year, or 130 million tons). Red River has good quality sediment and river water also contains many minerals. Thus, the Red River has been accreted to Hanoi fertile plain.

59. To Lich River which is a distributary of the Red River in Hanoi city. It flows through the districts of Thanh Xuan, Hoang Mai and Thanh Tri. The starting point of To Lich River is from Phan Dinh Phung drain (Ba Dinh District), bringing water from the Red River upstream to the Nhue River. The River has a length of about 14.6 km, width from 30-45m, 3-4m deep. The total area of basin is approximately 77.5 km^2. This River is also a place where receive sewage of the subproject, and itis about 1km from 220 KV Thanh Cong substation.

60. Also around the subproject area is Hoang Cau Lake and Thanh Cong lake that are approximately 60mand 550m from the subproject area respectively. Hydrological regime of two lakes is stable, ensuring water drainage for the area.

b) Groundwater resources

61. Reports on water quality in Hanoi presented that groundwater resources are being depleted and polluted. Ground water is exploited through a system of wells, with more than 170,000 wells, for extraction of 700,000 m3 per day. The Center for Water Resource Monitoring and Forecast of MONRE also confirms that the depth of the water table in Hanoi is increasing, which means that groundwater is being depleted. By 2020, the extraction is expected to reach 1.4 million m3 per day. Based on geological and hydrological surveys in the project area, groundwater levels are relatively stable in the boreholes, changing from 4.4 to 4.5 m.

c) Water quality

62. To assess the status of water quality at the subproject area, 3 samples of surface water (NM), 2 groundwater samples (NN) and 2 wastewater samples (NT)were taken in the subproject area during May 2015. Sampling locations are shown in Table .

Table 13: Sampling locations for water environment in the subproject area

No.	Code	Location	Coordinates
I	**Surface water**		
1	NM1	To Lich river at Moc drain	N: $21^0$00’538” E: $105^0$48’815”
2	NM2	To Lich river at sampling point where is about 600m from110kV Thuong Dinh substation	N: $20^0$59’483” E: $105^0$49’800”
3	NM3	Hoang Cau lake at sampling point where is about 60m from 220kV Thanh Cong substation	N: $21^0$00’925” E: $105^0$49’224”
II	**Underground water**		
1	NN1	At Sport house No. 59 Hoang Cau, about 210m from 220kV Thanh Cong substation (treated)	N: $21^0$01’071” E: $105^0$49’467”
2	NN2	At the motorcycle washing shop, where is beginning of lane 282 Thuong Dinh (untreated)	N: $20^0$59’468” E: $105^0$48’788”

No.	Code	Location	Coordinates
III. Wastewater			
1	NT1	In sewage manholes where untreated wastewater of 220KvThanh Cong substation flows in	N: $21^0$00'913" E: $105^0$49'252"
2	NT2	At discharged point of wastewater treatment system of 220kV Thanh Cong substations before wastewater is discharged into sewage system of residential areas of Trung Liet Ward	N: $21^0$00'916" E: $105^0$49'241"

(Source, EIA report, 2015)

63. Surface water quality. Results of surface water samples analysed are shown in Table .

Table 14: The results of analysis of surface water quality-May 2015

No.	Parameter	Unit	Result			QCVN 08:2015/BTNMT (Column B1)
			NM1	NM2	NM3	
1	pH	-	6.4	6.2	6.7	**5.5-9**
2	COD	mg/l	**230.2**	**241.7**	**64.3**	**30**
3	BOD_5	mg/l	**94.2**	**90.4**	**32.6**	**15**
4	DO	mg/l	**1.1**	**1.0**	4.1	**≥ 4**
5	TSS	mg/l	**197**	**189**	**126**	**50**
6	NO_2^-	mg/l	**0.17**	**0.16**	**0.02**	**0.04**
7	NH_4^+	mg/l	**6.21**	**7.18**	**3.25**	**0.9**
8	Zn	mg/l	**1.97**	**1.96**	1.21	**1.5**
9	Pb	mg/l	KPH	KPH	KPH	**0.05**
10	As	mg/l	0.001	0.001	0.001	**0.05**
11	NO_3^-	mg/l	**21.1**	**21.0**	8.12	**10**
12	Hg	mg/l	<0.001	<0.001	<0.001	**0.001**
13	Fe	mg/l	0.72	0.82	0.41	**1.5**
14	Oil and grease	mg/l	**2.11**	**2.19**	0.14	**1**
15	Total Coliform	MPN/ 100ml	**37,300**	**39,000**	**14,200**	**7,500**

(Source, EIA report, 2015)

Note: "-": Not specified, KPH: not detected;

QCVN 08: 2015 / BTNMT - National Technical Regulation on surface water quality.

Column B1 For irrigation purposes or other uses require the same water quality or the intended use as type B2.

B2-Use for water transport and other purposes with low water quality requirements

64. The analysed results show that the parameters expressing organic matter in term of chemical/biological oxygen demand (COD, BOD_5)exceeded the allowable limit (column B1) QCVN 08: 2015 / BTNMT. Particularly, COD ranges from 64.3 to 230.2 mg/l, exceeding 2.14 - 7.67 times; BOD_5 ranges between 32.6 to 94.2 mg/l, exceeding 2.17 to 6.28 times; TSS ranges between 126 – 297mg/l, exceeding 2.52 to 3.94 times; oil ranges between 0.14 to 2.19 mg/l, exceeding 1.14 to 2.19 times; Coliform ranges between 14200-39000 MPN/100ml, exceeding 1.89 to 5.2 times and NO_3 ranges between 8.12 to 21.1 mg/l reached 2.11 times. Thus, the surface water quality in the subproject area has signs of organic pollution. The causes may be due to domestic sewage from residential areas, wastewater from restaurants and bars in the

area that are not thoroughly treated and have been directly discharged to To Lich River and Hoang Cau Lake. In addition, rainwater runs off bringing contaminants into the To Lich River and Hoang Cau Lake.

65. Groundwater quality:The analysed results of groundwater quality in Thanh Cong-Thuong Dinh underground cable transmission line site are presented in Table 15.

Table 15: Analysed results of groundwater quality in the subproject site on May 2015

No.	Parameter	Unit	Result	QCVN 09:2015/BTNMT
1	pH	-	6,6	**5.5-8.5**
2	Hardness	mg/l	435	**500**
3	TS	mg/l	722	**1500**
4	NO_2^-	mg/l	0.18	**1**
5	NO_3^-	mg/l	7.29	**15**
6	NH_4^+	mg/l	0.05	**1**
7	Fe	mg/l	**8.21**	**5**
8	As	mg/l	0.04	**0.05**
9	Zn	mg/l	**0.32**	**3**
10	Cd	mg/l	KPH	**0.005**
11	Mn	mg/l	**0.83**	**0.5**
12	Cu	mg/l	0.007	**1**
13	Pb	mg/l	KPH	**0.01**
14	Hg	mg/l	KPH	**0.001**
15	Coliform	MPN/100ml	1	**3**

(Source, EIA report, 2015)

Note:NN1: Groundwater sampling at the substation

QCVN 09:2015BTNMT: National technical regulation on groundwater quality.

(-): unregulated, undetected.

66. The analysed results of untreated underground water sample shows that the Fe exceeds 1.64 times; Mn exceeds 1.66 times of standard values in QCVN 09:2015/BTNMT. This indicated that the groundwater quality is slightly polluted by heavy metals due to anoxic condition of ground aquifer which makes Fe and Mn in soluble condition. The sources of Fe and Mn may come from industrial wastewater at surrounding area, which percolates into ground aquifer.

67. Wastewater quality:Wastewater samples taken at the manhole and discharged point of wastewater treatment system of 220kV Thanh Cong substations at Trung Liet ward, were analysed. The results are presented in Table .

Table 16: The analyzed results of wastewater quality

No.	Parameter	Unit	Result	QCVN 14:2008/BTNMT (Column B)
1	pH	-	6.7	**5 - 9**
2	BOD_5	mg/l	47.2	**50**

No.	Parameter	Unit	Result	QCVN 14:2008/BTNMT (Column B)
3	TSS	mg/l	96.4	**100**
4	TDS	mg/l	574	**1,000**
5	Sulphur	mg/l	3.52	**4**
6	Ammonia	mg/l	9.57	**10**
7	Nitrate	mg/l	37.1	**50**
8	Animal fat and vegetable oil	mg/l	3.25	**20**
9	Total surfactant	mg/l	6.29	**10**
10	Phosphate	mg/l	5.6	**10**
11	Total Coliform	MPN/100ml	4,850	**5,000**

(*Source*: EIA report, 2015)

Note: "-": Not specified;
- QCVN 14: 2008 /BTNMT: National Technical Regulation on wastewater.
A:The maximum value allowed in wastewater being discharged into the water sources used for water supply purposes.
B: The maximum value allowed in waste water being discharged into water sources not used for drinking water supply.

68. Domestic wastewater sampling was taken at the discharge point of Thanh Cong substation, which generates mainly from the daily living activities of the workers working at the existing station, which contains high organic matter content since pre-treatment. However, all parameters are within the limits allowed by QCVN 14: 2008 / BTNMT (column B) after treatment, ensuring effluent quality before being discharged into a drainage system of Hanoi City

B. Biological Environment

Vegetation and Land Use

69. **Vegetation**. There are 23,510 ha of forest land in Hanoi (including 16,770 ha of former Ha Tay Province), accounting for 6.9% of total natural land area; including 3,922 ha of natural forests and 19,568 ha of forest plantations. Some nature reserves exist in the area such as Ba Vi National Park, Huong Pagoda Forest in My Duc District. Forest in Hanoi is an important resource to maintain the ecological balance, prevent soil erosion and facilitate tourism and relaxation activities. The project is to be implemented on the terrain of mainly farmland and hilly land, in rural area. The ecosystem is poor, characterized by the rural landscape in semi-mountainous area without any valuable, rare or endangered species.

70. Based on the reconnaissance survey conducted by EIA team the terrestrial ecosystem includes terrestrial flora consisting of mainly artificial vegetation: rice, tea plant, vegetables, fruits, shrub gardens and terrestrial fauna present no endangered animals, livestock animals mostly such as cattle, pigs, chickens, dogs, cats, etc.; natural fauna include some reptiles, rodents, birds, bats, rats, hamsters, frogs etc.

71. Aquatic ecosystem in rivers and lakes in the subproject area include phytoplankton, algae such as diatoms, green algae, duckweed. Also in aquatic ecosystems are submerged trees, Phragmites, shrubs around the banks. Aquatic species include fish, crabs, snails etc. Zooplankton includes thyroid groups, zoo benthic crabs, snails, clams group as mussels. Bivalve molluscs, gastropods, molluscs, crustaceans, shellfish, aquatic insects, fish. Large part

of river organisms concentrate on river bed and around banks to have shelter with more mud organic residue and to avoid strong currents.

72. No typical or high value vegetables covered along the underground cable transmission line because cable tranche are located in the crowded urban areas. The main vegetables could be listed as urban landscape trees such tropical almond, flamboyant, faux acajen, blackboard trees, lager stromia etc.

73. **Land use**.Total natural land area of 6 wards in the subproject area is 13.6129 km^2; which is totally urban residential area. No land area is temporarily and permanently acquired by the subproject because the cable tranche will be laid under the road.

Wildlife

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

Conservation areas

75. According to the list of natural parks and conservation areas of Vietnam stipulated by Ministry of Agriculture and Rural Development,there are no conservation areas within the proximity of the subproject site.

C. Socio-economic condition

Population

76. The subproject site situates in 6 wards of 2 districts of Dong Da and Thanh Xuan, Hanoi city, with a total area of 13.6129 km^2 and a population of 141,529 persons. The average density is 92,974 person/ km^2, no ethic minority lives in the subproject area. Details of affected wards are described in Table .

Table 17: Demographic characteristics of affected communes

No.	District/Ward	Natural area (km^2)	Population *(persons)*	Population density *(persons/ km^2)*	Ethnic Minority
	Dong Da District				
1	Trung Liet	***0.76***	21,668	5,549	None
2	Lang Ha	0.95	25,369	26,704	None
3	Thinh Quang	0.46	17,164	37,313	None
	Thanh Xuan District				
4	Thuong Dinh	11.212	21,143	1,886	None
5	Ha Dinh	0.07	17,000	242,857	None
6	Nhan Chinh	0.1609	39,185	243,536	None
	Total	13.6129	141,529	Average92,974.17	

Local Economy

77. In Hanoi, the average economic growth rate in period 2011-2015 reached 12-13%/year from 2016 to 2020 to reach about 11-12%. By 2015, per capita GDP of Hanoi is USD 4,100-

4,300 and the economic structure is as follows: services accounting for 54-55%, industry - construction accounts for 41-42% and agriculture 3-4%. In 2020, the service sector will account for 55.5 to 56.6%, industry - construction accounting for 41-42% and agriculture 2 - 2.5%. The growth rate of export value in Hanoi averaged 14-15%/year over the period 2011 to 2015 and 13-14% in the period 2016-2020.

78. Dong Da and Thanh Xuan Districts are two urban district of Hanoi city where the economic activities are developed with high level. Along the streets where the underground cable transmission line runs under road surface, there are many houses with small business and cultural – historical- education sites.

Social Infrastructure

a) Public Health and Sanitation

79. The subproject site is located in a distance of 5km to the central area of Hanoi that means good access to social services from local to central level is secured. The local health facilities include health centers at ward level, first aid and medical assistance for minor illnesses and health care services for mothers and children, such as immunization, pregnancy care, family planning, etc.At upper levels there are hospitals at municipal and central level, in addition to a broader system of private clinics and hospitals of high quality and expertise.

80. 100% of households in 6 wards of Thanh Xuan and Dong Da Districts have access to electricity, tap water. In the subproject area, all wards have tap water ensuring water quality for daily activities and the production and business of the people. Each ward has one clinic with one doctor and 3 to 5 nurses.

81. Solid waste is collected by Hanoi Urban Environment Company (URENCO), which is State Enterprise directly managed by the of Hanoi People's Committee. This enterprise operates under the model of parent company - subsidiary. The company currently consists of 18 departments and units with more than 5,000 employees.

b) Education

82. Hanoi has hundreds of leading institutes, more than 50 universities and colleges that are training important labourers and supplying some 80,000 graduates to the labor market.

83. Dong Da and Thanh Xuan districts have well-developed educational infrastructure. In addition, to public schools at all levels from pre-school to high school, this area possesses many colleges and universities such as University of Sciences; Social Sciences and Humanities University; University of Architecture; Hanoi University etc. and private educational institutions. The subproject wards have all4 school levels: kindergarten, elementary school, secondary school, junior high school and high school.

c) Communications

84. Hanoi is the biggest communication centre in the country. Its communications network satisfies swift communication information demand nationwide and worldwide. Infrastructure for transport, communications and electricity are being constantly improved so that people’s standard of living and access to services has improved appreciably. All households in the subproject area have TV and telephone. All communes or wards have their own mass communication facilities. The post office locations are a short distance for all people.

85. The subproject area is covered by post stations, many telephone networks as Viettel and VNPT telecommunications, and a number of other telecommunications companies are available. Internet services are very common and convenient in the area.

d) Water supply, electricity and transport

Water supply. Currently100% of households from 6 wards are supplied with 120 liters drinking water/ person/day from Da River water supply system.

Drainage. In Hanoi suburban areas, including the subproject area, the drainage system in general has not been completed; it is used for both sewage and storm water which are then discharged to the rivers and caused water pollution. The river/lake in the subproject area including To Lich River and Hoang Cau Lake that are listed as highly polluted water bodies.

Power supply. Hanoi currently has 7 electric stations and 200kV and 500kV lines, 23 10-kV electric downloading stations. Levels of 35, 10, and 6kV are gradually shrunk, and levels of 22kV/ 0.4kV are retained. A 22kV line in urban and neighbouring areas is designed.

Transport. Hanoi has a well-developed transport system. In Dong Da and Thanh Xuan districts the transportation system is highly developed with dense road network, which include asphalt streets, road tunnels at crossroad, road ring no. 2.5 and road ring 3 etc.

e) Cultural and Heritage Sites

86. A number of cultural relics and historical localities of Dong Da district is Temple of Literature, XaTac monuments, relics round Dai La, Chua Boc temple, Dong Da Mound and Quang Trung King Monument, Lang temple, Bich Cau temple, Hanoi station, etc.

87. Thanh Xuan District has several pagodas and temples, such as: Linh Thong pagoda, Thien Phuc pagoda, Khuong Trung pagoda, Quan Nhan Temple, Giap Nhat Temple, Ha Dinh temple, Cu Chinh temple, Hoi Xuan temple, Khuong Ha temple

88. In 6 wards, there are several public places of local communities as schools, universities, hospitals houses, pagodas, and offices that are considered sensitive receptors. Given the fact that the trenches will be excavated along the road sides, the environmental impacts would be high if they are not properly mitigated.A list of nearby sites is presented in Table .

Table 18: Sensitive receptors surveyed around the subproject site

110Kv Thanh Cong – Thuong Dinh underground cable transmission line		
No.	**Sites**	***Distance from the subproject (m)***
1	Linh Thong pagoda	300
2	Quan Nhan Temple	570
3	Giap Nhat Temple	50
4	Boc pagoda	1,000
5	Phuc Khanh Pagoda	520
6	Ha Dinh Ward People Committee office	70
7	Luong The Vinh Middle- High School, Khuong Dinh Middle School	100
8	Luong The Vinh peple-founded High School, Nguyen Trai High School	120
9	Secondary School for kindergarten Teachers	150
10	Khuong Dinh Kindergarten, Hanoi Intermediate Pharmaceutical school, University of Central Arts Pedagogy, Military School of Music	220-250
11	University of Natural Sciences	500
12	Aviation Medicine Institute	500
13	Medical University Hospital	1,000
	Installation of 2 new bays at 220 kV Thanh Cong substation	
No.	**Sites**	***Distance***
1	Dong Da Mound	450
2	Thai Ha church	400

3	Xa Dan Pagoda	650
4	Several temples along Nguyen Khang and Khuong Dinh roads	10
5	Quang Trung Secondary School	240
6	Little Foot Bilingual Nursery School	240
7	Thai Thinh Secondary School and Thai Thinh Primary School	350
8	Hoa Hong Nursery School	450
9	Hanoi Industry College	450
10	Trade Unions University	500
11	Banking Academy	660
12	Endocrine Hospital	500
13	Dong Da Hospital	500
14	Central Acupuncture Hospital	500

(Source: EIA report, 2015)

UXO Clearance

89. After many decades of war, bombs, mines and explosives are still an important issue in Vietnam. The subproject area is in the central part of Hanoi and almost the whole length of the underground cable (about 3.64 km of 3.76 km) will be installed in the available tunnel on the roads of Hoang Cau, ThaiThinh II (YenLang), Nguyen Ngoc Vu, KhuongDinh. Only new section (0.12 km) will be excavated at the intersection with Lang, Nguyen Trai Streets. The cable trench construction with dimensions: width 1.1 – 2.05m; depth 1.8 -2.42m.

Subproject affected people

90. The Subprojects will be implemented in 3 wards of Dong Da District and 3 Wards of Thanh Xuan District. Total permanently acquired land required is 6,988.5 m^2, including 6,831 m2 of transport land and 157.5 m^2 of public land under management of 6wards of Hanoi's 2 districts. The underground cable construction mainly happens on the road, which should not affect buildings and structures of the households.Therefore there is no demolition and resettlement. The expansion of two out going bays at 220kV Thanh Cong substations will demolish substation fence on Hoang Cau Street side with area of 90m^2. This area currently does not have trees, building houses, and inhabited resident.Since total area of permanently acquired land belongs to public land, no household is affected. The summary of land acquisition by the subproject is presented in Table.

Table 19: Summary on land acquisition by the subproject

No.	Affected land	Unit	Quantity
I	**Land**		**6,988.5**
1	**Permanently acquired**	**m^2**	**6,988.5**
1.1	Residential land	**m^2**	-
1.2	Agriculture land	**m^2**	-
1.3	Public land		**-**
1.3.1	*Ward Committee Land (Pavement)*	***m^2***	*157.5*
1.3.2	*Transportation land*	***m^2***	*6,831*
1.3.3	*Cemetery land*	***m^2***	-
2	**Temporary land**	**m^2**	**-**
1	Residential land	**m^2**	-
2	Agriculture land	**m^2**	-
II	**House and structure**	-	-
1	Level 1	**m^2**	-
2	Level 2	**m^2**	-

3	Level 3	**m^2**	-
4	Level 4	**m^2**	-
5	Fence	**m^2**	90
III	**Trees and crops**		
1	Permanently acquired crops	**m^2**	-
2	Temporary acquired crops	**m^2**	-
3	Trees	tree	-
4	Landscape plants	tree	-

(Source: Subproject Resettlement Plan)

Additional features of Thanh Cong – Thuong Dinh underground cable transmission line

91. 110 kV underground cable transmission line goes through very crowded area of Dong Da- Thanh Xuan districts and compensation and land clearance are not required. Thanh Cong – Thuong Dinh underground cable transmission line runs on highly populated streets with many cultural – historical- education sites.

Location at the start of line at Thanh Cong substation

Location of cables line from Hoang Cau to Yen Lang cross Thai Ha intersection

Location of cables line from Lang road to Nguyen Ngoc Vu cross To Lich river and run parallel with Moc bridge.

Location of cables line passing through the temple area located on Nguyen Ngoc Vu .

Location of cables line from Nguyen Ngoc Vu to Thuong Dinh cross over Nguyen Trai road.

Location of cables line from Khuong Dinh to 282 lane to connection point of Khuong Dinh substation.

Location of connection point at Thuong Dinh substation

Location of new built Thuong Dinh substation

Figure 5: Views of Thanh Cong – Thuong Dinh underground cable transmission line

VI. ENVIRONMENTALIMPACTSANDMITIGATION MEASURES

92. The assessment of potential impacts of the subproject is structured by the three development phases of the subproject defined by: pre-construction; construction; and post-construction operational phase. The potential impacts and mitigation measures of the each phase is discussed separately. This structure carried forward and also used to structure the EMP for the subproject.The subproject's items include: construction of the 110 kV underground cable line with a total length of 3.76 km and expansion of 2 bays in 220 KV Thanh Cong substation

A. Subproject Benefits

93. The primary targeted benefits of the subproject are i) to meet the load demand in the area, ii) to enhance the stability and safe operation of the grid in Hanoi, and iii) to improve the power supply reliability and flexibility in power supply.

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

a) Land acquisition and compensation

94. *Impacts*: The principal activities of the preparation phase consist of land acquisition and ground clearance for the construction of 3.7 km underground cable transmission line and two outgoing bays. There are 7 households will be affected by resettlement and land acquisition, which included 4 households and one public agency will be affected by permanent land acquisition and other 3 householders will be affected the business activities. Total permanently acquired land required to build construction is 6,988.5 m^2, including 6,831 m^2 transport land and 157.5 m^2 of public land under management of six wards of Hanoi's two districts.The total land area is limited to use in the safety corridor grid is 10,701 m^2. All this land belongs to roads going through the two districts of Hanoi. Detailed affected land and other properties in the subproject areas are shown inTable 20.

Table 20: Affected land area and properties

No.	District/ward	Total affected area*(m^2)*	Total permanently acquired area		Land affected by underground cable safety corridor *(m^2)*
			Transportation*(m^2)*	Public land*(m^2)*	
I	**Dong Da district**	**2,285.5**	**2,128.0**	**157.5**	**3,192**
1	TrungLiet	663.5	506.0	157.5	759
2	ThinhQuang	810.0	810.0	0	1,215
3	Lang Ha	812.0	812.0	0	1,218
II	**Thanh Xuan district**	**4,703.0**	**4,703.0**	**0**	**7,509**
1	NhanChinh	722.0	722.0	0	1,083
2	Thuong Dinh	2,424.0	2,424.0	0	3,636
3	HaDinh	1,557.0	1,557.0	0	2,790
	Total	**6,988.5**	**6,831.0**	**157.5**	**10,701**

(Source: Data inventory of losses on March 2016 of the subproject)

95. *Mitigation measures:*Affected households, agencies are informed ahead on the subproject implementation and participated in acquisition and inventory of land, consulted in compensation assistance. Compensation and resettlement activities need to:

- Develop an resettlement plan for the subproject with followed the approved resettlement policy framework of the project, ADB' SPS 2009 and relevant regulations of Vietnam governments and projects, such as:
    - Comply with the regulations of the Land Law No 45/2013/QH13 dated November 29,2013and relevant decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Hanoi People's Committee and project policies.
    - Comply with the regulations of the Electricity Law and the Decree No. 14/2014/ND-CP and relevant regulations on safety land area surrounding the substation
- Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations by strictly compliance with approved updated resettlement plan of Thanh Cong – Thuong Dinh subproject.
- Construct completely each work item to minimize the duration of temporary land use for the project construction.
- Coordinate to address people's claims/grievances relating to compensation

b) *UXO Clearance*

96. *Impacts*:In the subproject area, UXO may exist because it was bombed area during the war. If UXO clearance is not implemented, it may cause risks of worker's and people's life when conducting the project construction. Therefore the UXO clearance need to be implemented right before the construction starts to reduce risks during construction phase.

97. *Mitigation measure:*As requirements all construction works are implemented in Hanoi need to conduct UXO removal, thus HANOI DPMB will work with local relevant authorities to coordinate in conducting UXO removal. HANOI DPMB will need to engage an authorised 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 are already been cleared. The proposed guidance for UXO clearance could be summarized as follows:

- Execution of demining and UXO will be 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
- Before detecting UXO under wet fields, marshes pond with a depth <0.5 m, it is must to embankment and drain water to avoid remaining tidy UXO. When detecting UXO on

terrestrial land, 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 TCVN 4586-1997, issued by Explosive Engineering Command Ministry, and the other current regulations.
- Competent unit shall be responsible to notify the military commander in the Hanoi city (Capital city commander) on the implementation mission: clearance location, construction schedules and staying time in the locality.

C. Potential Impacts and Mitigation Measures during Construction phase

98. The potential environmental impacts of the subproject are associated primarily with the construction phase of the subproject. The main impacts of this phase are incurred from excavation of asphalt road for installation of underground cable. The potential impacts include dust, noise, emissions, transportation obstacles and construction waste. Other indirect impacts include increased traffic vehicles, the residence of workers,labor safety incidents and community safety.

a) Air quality and noise

99. *Impacts:*The main sources of air pollutant and noise could be come from dust, exhausts are generated by soil excavation of cable trench and transportation of construction materials, noise is generated by operation of construction machines, equipment and transportation vehicle.

100. *Dust*. Based on approved EIA as prepared by Government requirement,the concentrations of dust at distance 10 and 50mfrom the sources along the length (3670 m) of underground cable and dispersion distance (with height 15 m) are 0.338 mg/m^3 and 0.68 mg/m^3, respectively. It can be seen that at distance 10 m from the source, dust concentration in the air slightly exceed standard (0.3 mg/m3 of QCVN 05:2013/BTNMT: National technical regulations on ambient air quality -average 1 hour). Thus, dust, generated by subproject activities, could affect the local people living along streets where subproject taken place and traffic users on the subproject implemented streets along the project (motorcycle users, bus passengers...).

101. *Exhausts* such as NOx, SO2, CO generated by activities of transportation vehicles and construction machines and equipment.Vehicles used in the transportation of construction materials will be diesel engine truck from 3.5 to 16 tons. Transportation time of the subproject materials is estimated at 2 months, the estimated average vehicle counts 0.59 units/h. The number of construction will be mobilised on the sites will be very small. Since subproject area is busy urban area with high traffic density, the exhausted emissions would come from many sources other than from subproject activities.Therefore, event the contribution to ambient air quality from subproject activities will be very limited but subproject is taking place in an area with baseline air polluted, thus subproject activities will need appropriate mitigation measures to apply to minimize the impacts.

102. *Noise*:Underground cable line runs along the roads, with high traffic density. Thus, during the construction phase, the activities of subproject will have cumulative impacts of noise from operation of construction equipment and traffic vehicles.According to the results of baseline monitoring, the current noise level of the project area range from 72.9 to 75.8 dBA(higher the allowed level. Upon operation of the project, predicted noise will increase from 1-2 dBA.Appropriate mitigation measures need to apply to minimize the impacts.

103. The sensitive receivers are local residential households living along the Hoang Cau, Yen Lang, Lang, Nguyen Ngoc Vu, Khuong Dinh streets, as well as schools, offices, temples ect (listed in Table 18). However, these impacts are short-term and minor due to: i) very few construction equipment will need to be mobilised on the construction sites; ii) many excavation activities will be to conduct during nigh-time to avoid traffic conflicts; iii) as proposed in construction method of the subproject, the construction activities will be implemented section by section which surface recover right after completed; iv) demand on transport of waste and construction material will be not quite larger and v) all impacts will be stopped after 3-6 month when the construction is completed. However, appropriate mitigation measures need to be taken place to ensure that subproject activities will not create any further burdens on people living or traveling on the subproject areas.

104. Mitigation measures

- Construction units will frequently spray water at the construction sites and along the transport roads, particularly, Thuong Dinh, Nguyen Ngoc Vu, Lang, Yen Lang and Hoang Cau streets/roads. During the dry and hot days, spray minimum twice a day when the dust is visible with specialized water tankers of 4.5m^3.
- Cover the material storage, setting up appropriate of mobilize material to the site to ensure that material will not obstruct at the site and release dust;
- All material/waste storage shall be located at least 50 meters from any households and sensitive areas as mentioned above on Table 18 and waste will be transported from site within 24h;
- Apply rolling construction method, and recover surface of road or pavements right after construction activities completed on these sections;
- Soil scattered on the paved road and public road shall be removed immediately
- The trucks transporting construction materials and excavated soil will be covered by canvas. Planning and implementation of appropriate waste transportation to avoid the operation during daytime.
- All vehicles used for construction, and equipment and machines emitting noise, exhausts, fume will be maintained properly to minimize emission. The equipment, machines and vehicles causing large noise will be allowed to operate during day time...Undertaking the manual works/activities during nigh-time to avoid traffic conflicts.
- Drivers will be requested not to make horn and to turn of the truck engine when the truck stops for long time at the clouded residential area to reduce noise and gas emission.

b) *Water quality*

105. *Impacts:*Sources causing impacts on water environment include domestic wastewater and construction wastewater which generated on the construction site. The water pollution from domestic wastewater depends on the number of mobilised workers and the working duration. As estimated, about 25 technicians and workers will be mobilised on the construction site, with water supply quantity will be 100 litters/person/day (Source: Nguyen Thong, Water Supply, Construction Publisher, 2009). Wastewater volume equal to 100% of water used (Source: Section a, Clause 1, Article 39 of Decree No.80/2014 / ND - CP), therefore, waste water volume will be 25 x 100 x 100 % = 2,500 liters/day = 2.5 m^3/day. The pollutant loads of untreated domestic wastewater discharge volume is presented in Table 221.

Table 21: Pollutant load of untreated domestic wastewater discharge volume,

Pollutant	**Pollutant load***(g/day)*	**Discharge volume** *(l/day)*	**Average concentration** *(mg/l)*	**QCVN 14:2008/BTNMT Column B***(mg/l)*
BOD_5	1.625	2.500	650	50
TSS	1.500 – 1.625		600 - 650	100
NH_4^+	175		70	10
P_2O_5	42,5		17	-
Cl^-	250		100	-
Surfactant	50 – 62,5		20 - 25	10

106. Construction wastewater:The amount of water used in the construction phase of the project is small, about $4m^3$/day. Water is mainly used to mix the construction materials. However, this amount of water absorbed into the material and the amount of wastewater generated approximately 1% of water supplied to construction, which is approximately only 0.04 m^3 / day.

107. Spent oil, lubricant and grease, oily rags, grease, lubricant, waste sewage from washing machines, equipment and means with oil, grease and SS will pollute surface water source if not collected and treated properly. However, during the period of construction, machinery and transport vehicles are repaired and washed in the garage in the locality so there is no wastewater generated from this activity.

108. Finally, the impacts is considered as minor due to: (i) Workers will rent houses available sanitation facilities, (ii) The amount of wastewater in small construction and pollutant concentrations are not high, (iii) Repairs of construction machines in the garage has been allowed to operate, with wastewater treatment works and iv) existing drainage system is available around construction site which could be used to collect this type of waste water. However, the results from baseline survey show that most of the ambient surface water quality has been polluted thus appropriate mitigation measures need to apply to minimize any negative impacts from subproject activities

109. *Mitigation measures*

- For domestic wastewater: To facilitate the construction process, the contractor will not build temporary camps in the area of but hire local houses for about 5-7 workers /1 house, living during the construction process (4 - 5 houses). The contractor will ensure to provide adequate facilities in the site including latrines, holding areas and garbage cans at worker's house with good hygienic condition.
- *For construction wastewater*:As assessed in previous section, the amount of wastewater generated from the Thanh Cong-Thuong Dinh underground cable construction process is little, insignificant. This waste water container for suspended sediment before pouring into public water drainage system.The placement of washing instruments/vehicles next to the water bodies, canals will not be allowed.
- All the repair and maintenance of machines, equipment and transportation means will be implemented at garages outside the construction sites. Spent oil and grease, waste sewage from washing machines, equipment and means, clouts with oil, grease will need to be collected, transported and treated according to the Circular No. 12/2011-BTNMT dated on 14/04/2011 of MONRE.

c) Soil environment

110. *Impacts*: Sources causing impacts on soil environment will be mainly due to domestic and construction solid wastes, which could be listed as the below:

- Impacts due to domestic solid wastes created by workers' daily-life activities.The number of workers is about 25 people. Based on the emission levels of 0.5 kg / person. Estimated largest amount of waste generated in the construction phase are:0.5 kg / person / day x 25 = 12.5 kg /day. 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 and it can contain pathogenic bacteria/viruses that are harmful for human health and domestic animals.
- Impacts due to construction solid wastes created by construction activities. It is estimated that the construction waste will be remained soil (1,148.742 ton), waste rock (507.375 ton), asphalt concrete (621.058 ton) and broken bricks (24.833 tons), which need to be properly managed to avoid any sanitation issues.
- The volume of hazardous waste generated during the construction and bay installation is not large, it is estimated is about 2.65 kg and from living activities of the workers is 0.25 kg / day. The amount of this hazardous waste if not appropriated collected and handled shall spread into the environment, directly affect to soil, water, air and microorganisms in the subproject area and the surrounding area.

111. However, the impact will be quite minor due to: i) Workers will rent houses available sanitation facilities; ii) very limit of domestic waste will be generated (12,5 kg/day and 2,65 kg/day); iii) the construction activities will not involve much in hazardous substance; iv) the subproject located in the crowded urban area, no farming activities have been recorded and most activities will be implemented within ROW of subproject; v) almost excavated soil will landfilled at the city disposal area. However, to minimize impact and ensure sanitation condition, the set of mitigation measures need to be implemented on the site

112. *Mitigation measures*.

Measures to reduce domestic solid waste activities

- Provide sufficient funding to hire workers with adequate housing and sanitation
- Establish regulation, education and training of workers with hygiene awareness in the field.
- Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited.
- Burning of construction and domestic wastes shall be prohibited

Measures to reduce construction waste

- Excavated sludge will not be allowed to be temporary storage on the site; they are must immediately transported to disposal site at Lien Ha Commune, Dan Phuong district, Hanoi.
- The contactor needs to reach an agreement with CPC and ensure that waste disposal is complied with regulation.
- Utilize salvage excavated soil, rock for filling cable trench, For excavated soil which cannot be reused, it will be collected and transported to the disposal site.
- Reuse/recycle as much as possible construction solid waste such as empty cement sacks, wooden barrel, plastic, foam, cardboard boxes etc. The things that cannot be reused, disposed properly but not to leave them over soil surface.

- Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site. Then they should be transported to treat by a competent unit in accordance with the Circular No.36/2015/TT-BTNMT dated June 30th, 2015 issued by the MONRE regarding the hazardous wastes management.
- Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.

e) Impacts on Local Traffic

113. *Impacts*: Cable trench construction and expanding 2 bays at 220kV Thanh Cong substations will affect transportation routes due to the occupation of road surface for installing cable trench, gathering of materials, machinery and equipment and transporting raw materials. As designed, the cable trench will be placed on the existing road surface on sections of Hoang Cau – Thai Thinh II; Nguyen Ngoc Vu street – new Khuong Dinh street; and along the Khuong Dinh street. It is observed that the traffic volume is quite high on these streets. The construction activities on these streets will need to involve in temporary occupation of road surface and directly intervention on the existing roads. The construction activities could create high risks of traffic accidents, traffic congestion and dangerous for both workers and road users, specially during the rush hours and create difficulties for people or passengers to access their houses or bus stations location on these roads.

114. Moreover, as identified, the cable line will pass through a number of intersection points,such as 4 main points of cross intersection (mainly in Lang and Nguyen Trai streets) and several T-junctions. As the deign document, the installation of underground cable trench on these intersections will need to dig a ditch cross the roads. The intervention actions on these main roads may cause traffic congestion, traffic accidents for both workers and road users, which need to be properly managed.

115. Beside, during the construction, the subproject activities will add about 5 trips per day to existing transport networks. However, as observed that traffic networks are quite convenient in subproject areas, so many cross streets (such as NH6, Lang Ha – Le Van Luong Street, Lang Street) which are connected the subproject areas thus only 5 trip/day generated from subproject activities will not be possible to cause any impact on traffic flow on these roads.

116. However, these impacts is considered as moderate since i) the construction methods have been proposed as completion section by section; ii) many activities have bee proposed to be taken place during nigh time or avoid the rush hours; iii)the construction activities will be dispersed along the road section of more than 3km; iv)the volume of waste and construction material which need to transport is quite small;v) generated trips of subject is quite small, only 5trips per day; vi) only several heavy equipment will be transported to the construction sites;. Therefore, appropriate mitigation measures need to be implemented.

117. *Mitigation measures*:During construction, workers will follow the team in accordance with the assignment, working in shifts, with specific times. A reasonable construction schedule will be planned to avoid the rush hour when construct underground cable at the intersection over Lang road, Moc sewer, Nguyen Trai road. Particularly, the construction only takes from 10 pm to 5 am of the following day and skips working on the day of rain and storms. Construction will be fast, strictly follow the working plan.Contractor will provide guidance for traffic management and implement traffic mitigation measures during construction of underground cables along roads and intersections. Specifically:

- After digging trenches, pouring casting cable protection systems in accordance with design drawings, conduct backfilled immediately, restore the original road surface and pavements

to ensure traffic movement on the main roads such as Hoang Cau, Thai Thinh II; Nguyen Ngoc Vu, new Khuong Dinh, Nguyen Trai streets;

- Arrange reasonable work schedule to avoid rush hours to reduce traffic obstacle, the rush hours will be determined on the site since civil work have been started. And arrange the manual works implement during nigh time to reduce traffic conflicts;
- Place sign boards near construction sites (warning boards on both direction of road cross project route along Hoang Cau, Yen Lang, Lang, Nguyen Ngoc Vu, Khuong Dinh streets)to direct traffic means to slow down since go through construction area;
- Transport materials need to be within the allowable load. Not expand trucks' body and used medium/small trucks.
- Obtain the agreement with local authorities in using the transport routes.
- Set up construction site regulation for truck drive and provide training for them to increase responsibilities during driving the vehicles;
- Clear soil and construction materials which spill out on road surface.

f) Impact on switching, power connection in the process of expanding 02 bays and installing process of underground cables

118. *Impacts:*Conduct a power cut during the installation and testing operation of underground cable, 02 bays 220kV Thanh Cong substations expanding construction will affect the production, trading, transportation activities and daily living condition at the project area of Hoang Cau, Yen Lang, Lang, Nguyen Ngoc Vu, Khuong Dinh streets.However, the impact is small and short- tem because the power cut is happened during short time at the end of construction phase, which last only a few days and power will only cut at the connection points.

119. *Mitigation measures:*Contractor will implement the following:

- Conduct electricity cut only when performing the connection, power cut during the period 30-60 minutes (about 9 - 10 am or 3-4 pm).
- Prepare specific, reasonable construction and power shutdown plan: organizing rotating power cuts, avoiding power cuts on peak-hour, power cuts only at connection points, limit power cutting on wide-ranging area.
- Announce on mass media before cutting power for construction at least one week so that people at the cut-of area can plan ahead their activities.

g) Water pipe incidents and damages of underground infrastructure

120. *Impacts:*In the project area are water supply piping and drainage (along or cross), communication systems and power grids.The construction process of underground cables may cause high risks of break or damage to water pipeline, underground cables, drainage systems which located on the trees which will installed the power cable trench of the subproject. As identified in the survey documents, the underground cable trench will cross over existing other underground facilities as listed: i) three main intersection points with other cable system at Thuong Dinh, Khuong Dinh and Giap Nhat streets; ii) 11 cross over points with water supply systems at Thai Ha, Thai Thinh, Giap Nhat, Nguyen Trai and Khuong Dinh streets; iii) intersection with wastewater discharge system at three points on Khuong Dinh, Nguyen Trai, and Giap Nhat streets; and iv) others facilities on 3 main points on Hoang Cau and Khuong Dinh streets. Therefore, any impacts of the above existing underground facilities may cause temporary interruptions of services provisions and affect to trading, transportation activities and daily living condition of people and operation of agencies and environmental, sanitation issues

in the subproject area. The impacts could be more serious if a specific survey or coordination activities between Construction contractor and relevant agencies are not implemented in order to make plan for avoiding the damage or compensation if any

121. However, these impacts is considered as minor since(i) during the design stage, the design consultant has consulted relevant design (regarding water supply pipe, optical cable, drainage…) to fully identify the locations of under ground facilities along the subproject streets; (ii) underground facilities in the subproject areas are small scope.

122. *Mitigation measures*: The following mitigation measures will be applied:

- During design, coordination with relevant agencies such as VIWASE, Hanoi water sypply company, Hanoi drainage companies… to fully identify locations of existing underground facilities and development appropriate construction method to avoid impacts on these facilities;
- As developed in the project documents, construction methods will be detail for each intersection points, such as at the location cross water sypply the cable trench will goes under the exsiting water pipeline, meanwhile, cable trench will cross over the concrete ditch of dranage water or other cable line system.
- When construct of underground cable, the contractor must report to the management and operation unit of underground infrastructures for coordination;
- Do not bend cables or other sharp objects/equipment on cables. And appoint professional staff to supervise the construction process
- Develop a plan for possible contingencies will be set up in which there is any broken facilities will be compensated by Contractor if any;
- Road surface should be fully compensated as its origin after completion cable installation section.

h) Occupational health and safety of workers

123. *Impacts:*Construction activities may cause health harm and danger of the workers' lives, specifically. The accident may occur since almost many section of underground cable trench will be installed on the main crowded streets which may lead to high risk of hitting between traffic vehicle and workers on the site. Moreover, as designed many sections and activities of the subprojects will need to implement during nigh time which may cause high risks for workers during operation of construction machine/equipment if light will not be sufficiently maintained. Beside, occupational health issues could be results of low quality of living condition may cause eye affection, skin disease and hear relative disease and electric shocks during connecting and test electric with the existing substations. However, the risks/failures could occur at low probability because i) workers who operate machine will require professional skills as regulation; ii) as mentioned above, demand of transportation is not much; iii) as stated in design report, workers are supported to rent housing guarantee sanitary conditions, light; and iv) testing of electric equipment will require strict and specific procedures which will help to reduce electric shocks; v) These impacts are mitigate and last only 3 months during the construction phase and will stop when the subproject construction phase finishes.

124. *Mitigation measures:*

- Health and safety plan (HSP) will be prepared and implemented by the contractor.
- All construction equipment, tools will be carefully examined for quality and quantity before used.

- Contractor need to work with CSC, PIC and PMU 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, 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 each construction site to ensure patients can receive first aid timely before transporting them to the medical station/hospital
- 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.
- 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.

i) Community health and safety

125. *Impacts*:Impacts on health and safety of local people and traffic users on the main roads of subproject areas may be included dust and noise generated from construction, which will be affected to households closed to the site and officers of substation route. Traffic safety is also main impacts in the main intersections, nearby roads as defined in Impacts on Local Traffic section due to road surface occupation, conflict between construction equipment and transport vehicles on the road. Electric shock and other accident may occur to local people since they are illegal entering construction sites.However, these impacts are considered as minor and short-term since: i) the construction scale is small, which is concentrating on each short section (about 50 m) when one section is finished the following section will be just started; ii) construction activities will be very short time and construction area will be fenced by iron sheet and within the ROW.

126. *Mitigation measures*: To mitigate these potential impacts, the civil contractor will develop a community health and safety plan (CHSP) that incorporates good international best practice and recognized standards. The CHSP will include:

- Specific emergency response procedures for traffic accident, working accident, electrocution. The detail guidance is described in the emergency response plan
- Communication systems and protocols, interaction with local and regional emergency and health authorities;
- Provide warning signs as noted in impacts on local traffic section;
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of firefighting;
- Contractors arrange funding and manpower implementing mitigation measures.

k) Social disturbance

127. *Impacts*: It is estimated that 25 workers will be mobilized on the construction site. The concentration of workers could lead to several social problems on the sites such as:

- Social evils and diseases transmission could negatively affect local residents as well as workers due to low living condition of workers which could lead to the appearance of eye disease, skin disease, and respiration cases and then it would be spread out in the local communities.
- Conflict between workers and local people;
- Traffic safety in the main intersections as defined in Impacts on Local Traffic item. Uncontrolled and poor construction schedule could lead to high risks of traffic accident, especially during rush hours.

128. However,these impacts are insignificant, short-term, only occur in the construction phase along 3.7 km of underground cable and it will stop when the project construction finishes. And impacts could be controlled through appropriate mitigation measures.

129. Mitigation measures

- Manage and educate workers to enhance their awareness of environmental sanitation and health protection.
- In order to minimize the risk of injury to the local residents and the workers, it needs to comply with the Government of Viet Nam's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) (http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES) that govern the safe and orderly operation of civil works
- Equip medicine cabinet for protecting workers' health in time.
- Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to CPCs within the project area during the construction phase. They will 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 contractor shall be strictly treated in accordance with laws.
- Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education will be given to workers.

- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.

l) Repair, restore, and return the ground after construction completion

130. 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, sewage system and public infrastructures damaged by the subproject construction.
- Require the Contractor within 30 days after the end of construction to dismantle, move all materials, components redundant, construction waste to designated location, which is planned waste dump at Lien Ha commune, Dan Phuong, Hanoi; to move machinery and equipment used in construction works out of construction site.
- For the underground cable construction, cleaning and restoration of the ground on each construction phase. Ensure restore to the original state by at 5am the next day.
- The construction contractor will prepare regulation prohibiting the dumping of ground cleaning waste to the neighbourhood.

m) Biological impacts:

131. No typical or high value vegetables covered along the underground cable transmission line because cable tranche are located in the crowded urban areas, the main vegetables could be listed as urban landscape trees such tropical almond, flamboyant, blackboard trees, lager stromia. Moreover, no trees will be removed or cut by subproject activities. Therefore, subproject will not cause impacts on biological system.

D. Potential Impacts and Mitigation Measures during Operation phase

132. The potential impacts of the operation of the completed 220 kV Thanh Cong-Thuong Dinh underground cable transmission line and two outgoing bays and mitigation measures for the impacts are described as follows:

a) Prevention of cable break incident

133. *Impacts*: During operation, underground cable could be broken due to digging activities of other works, or being corrosive because of acidic rain water or leakage of industrial wastewater. However, these impacts are mitigatable and rarely happened since (i) construction of underground cables is strictly in accordance with Decree No.106/2005 / ND - CP of the Government dated 17 August 2005 regarding detailing and guiding the implementation of some provisions of the Electricity Law on protection secure high-voltage power grid works, safety corridors of underground cable protection; (ii)Cable is placed inside durable HDPE pipe then buried tightly in the ground across the entire line.

134. *Mitigation measures*:To prevent cable break accidents the following measures will be implemented:

- Within underground high-voltage electricity cable protection corridors, prohibits digging, piling, serving as landfill or discharging industrial wastewater.
- Maintain the drainage ditch on the cable routing area to avoid water pregnant that may cause water percolating into cable trench.

- Where incidents such as leakage into the cable trench line, cables are broken, occur immediately notify the nearest power agency for handling measures: power cuts, technical staffing to inspect and repair.

b) Occupational health and safety of the workers during the TL periodic maintenance process:

135. *Impacts*:The occupational health and safety issues during the operation and maintenance of underground cable TL include electrocution risk due to exposure to high voltage systems when maintaining and repairing the underground cable TL or living near the cable trench, which includes:

- Exposure to high voltage systems: Workers may come in contact with power lines/equipment during the maintenance and repair of the facilities and electrocution from direct contact with high-voltage electricity is a hazard directly related to facilities.
- Exposure to electric and magnetic fields (EMF): Typically, workers repairing and maintaining the underground cable have higher exposure to EMF than community because of working in close proximity to electric power equipment.

136. Using observations of EMF in an operational 110kV substation under similar circumstances (see Table 22), crews ensuring working time as stipulated, ensuring time for contacting with EMF, it is assumable that impact on local people caused by forecasted EMF of this subproject will be insignificant.

Table 22: Monitoring EMF in Gia Lam 110kV substation during operation phase for reference

TT	Monitoring location	Electric intensity (kV/m)	Magnetic intensity (A/m)
1	Control Room	0.002	0.2
2	22kV distribution room	0.012	0.4
3	Transformer	1.7	7.0

(*Source*: Thanh Cong-Thuong Dinh EIA report 2014)

137. *Mitigation measures:*The Operator of the underground cable will follow the World Bank Group's Environment, Health and Safety Guidelines and EVN guidelines when carrying out maintenance of the underground cable transmission line. Some of prevention and control measures when working with electrical systems are:

- Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers.
- Adherence to electrical safety standards.
- Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work of the underground cable transmission line.

138. Occupational EMF exposure will be minimized through the implementation of an EMF safety program that includes:

- Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones
- Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones.
- Utilization of personal monitors during work activities.
- Post safety signs and warning signs.

139. In addition, in the operation phase, training for workers will be conducted so that worker can respond to risks/failures and meet the operation procedures. An emergency and safety guideline will be prepared and disseminated to the workers for handling risks/failures occurring in the operation process, e.g. risks of electric shock, fire, and explosion.

140. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety to communities and residents living near the underground cable trench.

c) Community Health and Safety

141. *Impacts:*

- **Electric shock risk**:the community can be exposed to electric shock hazards as a result of direct contact with high voltage electricity or from contact with tools, vehicles, or other devices that come in contact with high-voltage electricity.
- **Exposure to Electromagnetic Field (EMF)**: The transmission frequency commonly used in transmission systems ranges from 50 Hz - 60Hz which is considered to be an extremely low frequency (IFC, 2007). In general electric fields are the strongest close to the source and diminish with distance.

142. *Mitigation measures:*To prevent electrocution risk:Hanoi Power Company will implement the following:

- Comply with operation procedures and safety requirements;
- Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the underground cable trench.
- Observe/Test EMF at resident's buildings for treating appropriately if any complaint.

143. To prevent impacts of EMF: the World Health Organization (WHO) reported that there is inconclusive evidence about substantive long-term health issues related to radiation emanating from low frequency electric fields at levels generally encountered by members of the community. Potential health effects associated with exposure to EMF is not well-established due to lack of empirical data demonstrating adverse health effects. However, the community will be warned about the safety distances from the underground cable trench through warning marks and prohibition of digging into the cable trench area

d) Climate Change.

144. The climate change would impact on the subproject components. Based on the Regional Global Circulation modelling project green house –climate change would induce changes to the frequency and severity of rainfall events in the subproject area. In recent years there is a change of time and intensity of rain in the Hanoi area. Together with the expansion of cities and the progress of construction of the drainage system of the city of the level and extent of flooding due to rainfall has increased in scope and magnitude. So during the construction process, designed must consider this factor.

VII. ANALYSIS OF ALTERNATIVES

145. Based on the subproject requirements and in accordance with the existing grid structure in the region, JSC Electric Construction Consultant 4 has conducted field survey and proposed 02 alignment alternatives to build underground cable route 110kV Thanh Cong - Thuong Dinh as follows:

- **Alternative 1** (Following the construction plan of Hanoi): double-circuit underground cable line comes from bus bar E1.11 of 110kV Thanh Cong substations, follows Hoang Cau Street, Thai Thinh 2, Lang, crossing Lich River, then follows Nguyen Ngoc Vu, Le Van Luong, prolonged Hoang Dao Thuy,Ring road 2.5, Khuong Dinh, connected to 02 bays of Thuong Dinh E1.5 110kV substation
- **Alternative 2**(proposed alternative): double-circuit underground cable line comes from bus bar E1.11 of 110kV Thanh Cong substations, follows Hoang Cau Street, Thai Thinh 2, Lang, crossing Lich River, then follows Nguyen Ngoc Vu , new Khuong Dinh, connected to connected to 02 bays of Thuong Dinh E1.5 110kV substation

The comparison of the two alternatives is presented in Table 23

Table 23: Comparison of the two alternatives for construction of 110kV underground cable Thanh Cong - Thuong Dinh

Compare items	Alternative 1 (Plan under general construction planning of Hanoi City)	Alternative 2 (Suggested Plan)
City Planning	Consistent with general construction plan of Hanoi, but now the ring road 2.5 is unfinished yet. The cable construction should not be implemented on this road. On the other hand, the cable section running along ring road 2.5, cutting Nguyen Trai Street belongs to construction area of elevated railway projects number 2.	No conflict with other local planning.
Natural conditions, levelling volume, foundation construction	Spacious, relatively flat and dry Topography; geological structure is clay, hardened state	Spacious, relatively flat and dry topography; geological structure is clay, hardened state.
Cutting across the existing underground infrastructure	Crossover the rectangular sewage along Hoang Cau and Thai Thinh 2 Streets. Crossover 220kV and 110kV underground cable before crossing Lich River In addition there are cross-routes with some pipes, sewer lines to Lich River	Crossover the rectangular sewage along Hoang Cau and Thai Thinh 2 Streets. Crossover 220kV and 110kV underground cable before crossing Lich River In addition there are cross-routes with some pipes, sewer lines to Lich River

Compare items	**Alternative 1** (Plan under general construction planning of Hanoi City)	**Alternative 2** (Suggested Plan)
Infrastructure	Facilitate the process of construction and operation and management of cable line.	Facilitate the process of construction and operation and management of cable line.
Environmental impacts and Compensation	Impact on the environment is limited; clearing and compensation is medium scale	Impact on the environment is limited; clearing and compensation is small scale
Permanent land acquisition	10.960m^2	6.831m^2
Land Type	Transportation Land	Transportation Land

146. The comparison of 02 alternatives showed that the alternative 2 has no conflicts with other local planning, facilitates the construction work, acquires fewer land area and clearing and compensation is small scale. In addition, the route was agreed by the departments and Hanoi People committee. Therefore, the Alternative 2 has been selected

VIII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Public Consultation

147. The stakeholder consultation procedure was developed to meet the requirements of meaningful consultation as stipulated by the ADB SPS (2009) as well as Vietnam Law on Environmental Protection (2014). The strategy embodied the principles of meaningful engagement, transparency, participation, and inclusiveness to ensure that affected and marginalized groups such as women and the poor were given equal opportunities to participate in the design of the subproject.

Identification of Stakeholders

148. Stakeholders were identified and participated in consultation. Communication with 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) Ward People's Committee, People's Council, (ii) Project Executing Agency (EVN HANOI), (iii)HANOI DPMB;
- Organizations/unions/associations such as Women Union and Fatherland Front that provided various information for the design of the subproject, and that might participate in implementation of measures and interventions;
- Households and enterprises living along the underground cable transmission line can be people who will be directly affected or be adversely impacted or can be people who will receive benefits from the determination and implementation of mitigation measures against adverse impacts; and
- Organizations, individuals affected by the subproject.

Public consultation procedures

149. The process of public consultation organized by the Project Management Unit Hanoi electricity development in conjunction with the EIA consultants conducted in Trung Liet Ward, Lang Ha, Quang Thinh, Dong Da District; Thuong Dinh ward, Ha Dinh, Nhan Chinh, Thanh Xuan district, Hanoi.

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

i. Engineering consultant introduced the subproject "110kV Thanh Cong-Thuong Dinh underground cable transmission" and the length of the transmission line that will cross over the communes and wards.

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

iii. During the meeting, people presented their questions and comments on environmental issues. Consultants and Project Owner answered and explained all questions of the participants. Participants of the public consultation meeting included the ward leaders, the representatives of Fatherland Front of the locality and the affected organizations/unions.

Results of Public Consultation

151. The meetings were organised with representatives of People Committee and Fatherland Front Association who are representatives of local authorities and affected people. The minutes of meetings are presented in Appendix B.The consultation dates and number of participants is as in Table 24

Table 24 Consultation dates and number of participants

No.	District/ward	Public Consultation date	Participants		Total of participants
			Female	Male	
I	**Dong Da district**				
1	Thinh Quang	7 May 2015	1	1	2
2	Lang Ha	14 May 2015	1	2	3
II	**Thanh Xuan district**				
1	Nhan Chinh	5 May 2015	1	2	3
2	Thuong Dinh	15 May 2015	2	1	3
3	Ha Dinh	14 March 2016	1	4	5
	Total		**6**	**10**	**16**

152. The main comments of communal authorities are as follows:

- Agree with the project, however, it is recommended to ensure all proposed mitigation measures to be implemented strictly and effectively.
- The Contractor should take required measures to rehabilitate the area, the re-cultivation, while avoiding conflicts and grievances as many as possible.
- It is recommend focusing on safety measures during the operation of the underground cable transmission line, to ensure the safety conditions, health for worker and local people to avoid any incidents.

153. The summary of comments/questions from local authorities/people and answers of project owners and consultants are summarized inTable 25.

Table 25: Discussion summary of public consultation

No.	Comments	Response from Project Owner	Response from the project
I	**Thinh Quang Ward-Dong Da District**		
1	1. Project owner needs to seriously implement the mitigation measures to minimize negative impacts to environments generated by the project. 2. When incidents occur, the Project owner must notify immediately of the local authorities to work together to overcome the problem. 3. Before the project implementation, the	Project owner agreed with the ward People's Committee and Fatherland Front Committee with the comments and will implement/comply with them. Project owner will require the successful bidder (contractor) to implement	Mitigation measures are presented in Section X. Environmental Management Plan

No.	Comments	Response from Project Owner	Response from the project
	Project owner should comply with the provisions of law; Inform local people about the project working plan and coordinate with local agencies involved in the implementation of the project. - Project owner must strictly implement the mitigation measures stated in the report of environmental impact assessment. - Contractor should coordinate with local authorities in management of cadres and workers;register temporary residence of workers. - Investor, contractor should solve well issues that arise when implementing the project.	measures to minimize adverse impacts on the environment during construction phase, and require operation unit during operation phase to implement environmental protection/mitigation measures as mentioned in the EIA report	
II	**Lang Ha Ward, Dong Da District**		
2	Project owner should inform local authorities/people about the project working plan and coordinate with local agencies involved in the implementation of the project. During the project construction phase the contractor should strictly implement the mitigation measures; minimize negative impacts to environments generated by the project. When incidents occur, the contractor must notify immediately to the local authorities to work together to overcome the matters. - The Project owner needs to strictly implement the mitigation measures stated in the environmental impact assessment report. - Contractor should coordinate with local authorities to carry out the management of cadres and workers. - Contractor should rehabilitate the construction area underground cable when construction is complete	Investors agreed with the ward People's Committee and Fatherland Front Committee with the comments and will implement/comply with them. Project owner will require the successful bidder (contractor) to implement measures to minimize adverse impacts on the environment during construction phase, and require operation unit during operation phase to implement environmental protection/mitigation measures	Mitigation measures are presented in Section VI. Potential Impacts and Mitigation Measures Section X. Environmental Management Plan
III	***People's Committee of Ha Dinh Ward, Thanh Xuan district***		
3	(1) Project owner should inform in detailed the project implementation schedule to local authorities/people and coordinate with local agencies involved in the project implementation. (2) Contractor should seriously implement the mitigation measures to minimize environment negative impacts generated by the project. (3) When incidents occur, the project owner must notify to the local authorities immediately to work together to overcome	The role and responsibilities of the contractor were made clear in the meeting. The Project Owner and the Contractor will commit to follow communities' supervision Contractor will be committed to implement properly measures to minimize the impacts. In the case of a	Mitigation measures are presented in Section VI. Potential Impacts and Mitigation Measures

No.	Comments	Response from Project Owner	Response from the project
	the problem - Contractor should coordinate with local authorities to register temporary residence for the workers and employees. - Contractor should Implement fully the provisions of the regional implementation of the project - Contractor should be strictly supervised/monitored to avoid damages to people. Safety measures should be well taken during operation of the TL	malfunction in the line, affecting the equipment, infrastructure and people's health, the investor will be liable under the law.	
IV	**Nhan Chinh ward, Thanh Xuan district**		
5	Project owner should inform local authorities/people about the project working plan and coordinate with local agencies involved in the implementation of the project. During the project construction phase the contractor should strictly implement the mitigation measures; minimize negative impacts to environments generated by the project. When incidents occur, the contractor must notify immediately to the local authorities to work together to overcome the matters. - The Project owner needs to strictly implement the mitigation measures stated in the environmental impact assessment report. - Contractor should coordinate with local authorities to carry out the management of cadres and workers. Contractor should rehabilitate the construction area underground cable when construction is complete	Investors agreed with the ward People's Committee and Fatherland Front Committee with the comments and will implement/comply with them. Project owner will require the successful bidder (contractor) to implement measures to minimize adverse impacts on the environment during construction phase, and require operation unit during operation phase to implement environmental protection/mitigation measures	Mitigation measures are presented in Section VI. Potential Impacts and Mitigation Measures
V	**Thuong Dinh Ward, Thanh Xuan district**		
6	Project owner should inform local authorities/people about the project working plan and coordinate with local agencies involved in the implementation of the project. During the project construction phase the contractor should strictly implement the mitigation measures; minimize negative impacts to environments generated by the project. When incidents occur, the contractor must notify immediately to the local authorities to work together to overcome the problem. - The Project owner needs to strictly implement the mitigation measures stated in the environmental impact assessment	The Project Owner and Contractor are committed to implement environmental mitigation measures during construction phase. Also it is recommended that community supervision should be advocated for best effectiveness. Noted. Cooperation between project side and local authority will be maintained at all project phases from designing to operation.	Mitigation measures are presented in Section VI. Potential Impacts and Mitigation Measures Section X. Environmental Management Plan

No.	Comments	Response from Project Owner	Response from the project
	report. - Contractor should coordinate with local authorities to carry out the management of cadres and workers. Contractor should rehabilitate the construction area when construction is complete -Communal staff should be involved in the project implementation monitoring process to ensure people's interest and prevent possible conflicts between local people and workers.		

154. In short, the local people agree with the implementation of the subproject, the concerns were primarily on ensuring mitigation measures of the contractor, as well as the responsibilities of involved parties in cases of incidents and damage to property and threatening people's safety. After the explanation and clarification of missing information by the consultant, local community and authorities agreed completely with the project.

155. During construction phase the project owner shall notify the Ward PCs on the progress of construction, publicize approved IEE, and EIA in Vietnamese in Ward PC offices. Since the Grievance Redress Mechanism is presented and agreed to/by the affected communities through public consultations and there is no change in project details and context, the subsequent public consultation meetings would not be conducted.

B. Information disclosure

156. Formal information disclosure to the affected persons and stakeholders of "110 kV Thanh Cong Thuong Dinh underground cable transmission line" subproject aims to continuing the process of 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.

157. IEE must be easily to understand in order that the stakeholders can comment in written and verbal form in local language of Vietnamese. At a minimum, Executive Summary of the IEE should be written in Vietnamese and distributed to all PAPs. IEE will be available at the EVNHANOI/PMPB office in Hanoi 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 will be available at the above websites, offices and localities. IEE will be available on the ADB website as well as EMP report that is prepared by the EA/IA after implementation begins.

IX. GRIEVANCE REDRESS MECHANISM

158. A well-defined grievance redress and resolution mechanism will be established to address affected persons (AP) grievances and complaints regarding environmental issues, land acquisition, compensation and resettlement in a timely and satisfactory manner. Particularly, the compensation of land acquisition and environmental issues will be done right after the complaint being identified is correct.All APs of 6 wards of Dong Da and Thanh Xuan Districts were made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process during public consultation meeting. The grievance redress mechanism and appeal procedures are also explained in IEE report in Vietnamese. Affected people can have this information from ward people committee office.

159. APs are entitled to lodge complaints regarding any aspect of affected environments, land acquisition and resettlement requirements such as, noise, pollution, entitlements, rates and payment and procedures for resettlement and income restoration programs. APs complaints can be made verbally or in written form. In the case of verbal complaints, the committee on grievance will be responsible to make a written record during the first meeting with the APs.

160. The designated unit who is responsible for handling complaints shall exercise all efforts to settle APs issues at the ward level through appropriate community consultation. All meetings shall be recorded and copies shall be provided to APs. A copy of the minutes of meetings and actions undertaken shall be provided to the EA/IA and ADB upon request.

161. The procedures for grievance redress is defined below and summarized inFigure 6. The procedure described below should apply easily to both social and environmental issues and be consistent with the legal process for resolution of disputes in Viet Nam.

i) **Stage 1**: Complaints from APs for the first time shall be lodged verbally or in written form to the Contractor. The complaints shall be received by the Contractor and discussed with the APs to seek possible solutions.

ii) **Stage 2**: If no understanding or amicable solution can be reached or if no response is received from the Contractor, the APs can elevate the case to the Project Owner. The Project Owner is responsible to work with the Contractor for resolutions.

iii) **Stage 3**: If no understanding or amicable solution can be reached again, the APs can appeal to Commune People's Committee. The CPC will review and issue a decision on the appeal within 15 days from the day the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

iv) **Stage 4**: If no understanding or amicable solution can be reached or if no response is received from the CPC within 15 days from the day the complaint is received, APs can elevate the case to the District People's Committee. The District People's Committee is expected to respond within 15 days upon receiving the APs appeal.

v) **Stage 5**: If the AP is not satisfied with the decision of the District Office, or in the absence of any response, the APs can appeal to the Hanoi Municipal People's Committee (MPC). The MPC will review and issue a decision on the appeal within 30 days from the day the complaint is received.

vi) **Stage6**: If the AP is still not satisfied with the decision of the HCMC People' Committee or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the Court at City level. The court will address the appeal by written decision and submit copies to the respective entities which include the EA, PPC, DPC, CPC and the APs. If, however, the AP is still not satisfied with the City Court's decision, the case may be elevated to the court at higher level (the Higher Court).

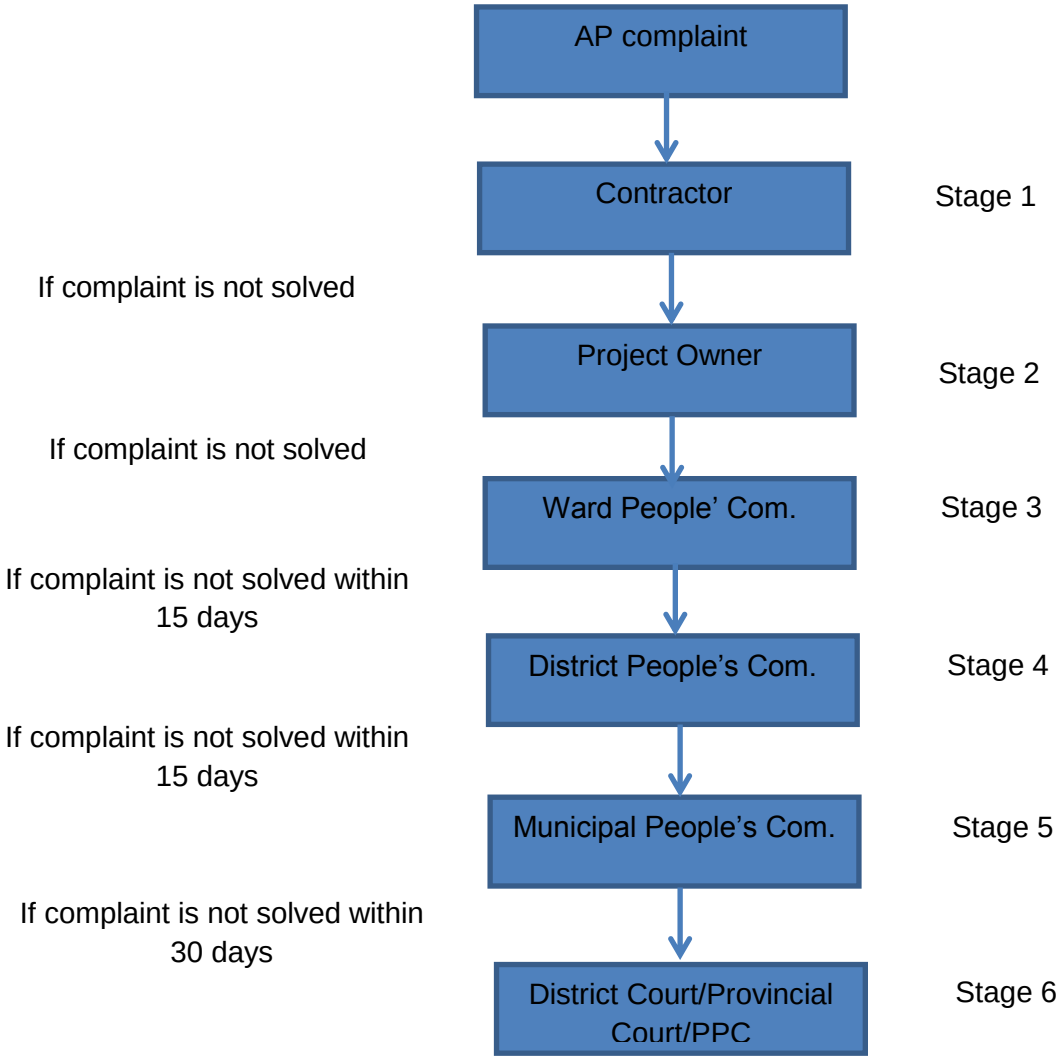

Figure 6: Summary of GRM

162. The IA and EVN Hanoi will be responsible for checking the procedures and resolutions of grievances and complaints. The EVN/IA must have expertise and experience in social and environmental issues associated with infrastructure developments. The EVN/IA may recommend further measures to be taken to redress unresolved grievances. The environmental specialist of IA will provide the necessary training to improve grievance procedures for People's Committees when required.

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

164. If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, APs have the right to directly discuss their concerns or problems with the ADB

Southeast Asia Department through the ADB Viet Nam Resident Mission (VRM). If APs are still not satisfied with the responses of VRM, they can directly contact the ADB Office of the Special Project Facilitator (OSPF).

X. ENVIRONMENTALMANAGEMENT PLAN

A. Mitigation

165. An EMP has been prepared for the subproject “110 kV Thanh Cong-Thuong Dinh underground cable transmission line” with the purpose of integrating the results of the IEE into a formal management plan that is implemented parallel with the subproject to prevent or minimize potential environmental impacts and issues that were identified by the IEE. The EMP addresses the results of the public consultations on the subproject that were convened as a part of the IEE.

166. The EMP consists of an impacts mitigation plan and a monitoring plan. The 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.

167. Environmental impact mitigation plan has been developed based on each subproject activities with respective impact and mitigation measure. Also, the plan identifies the reports, responsibility of subproject’s stakeholders as well as estimated cost for implementing mitigation measures. Detailed contents are shown inTable 26.

168. Emergency Response Plan: The Contractor must develop emergency or incident response procedures during construction and operation phases of the 110 kV Thanh Cong Thuong Dinh underground cable transmission line to protect workers and the public. The emergency response plan (ERP) outlines the roles and responsibilities of persons from first identification of an incident or emergency to the final steps of safe and complete closure of the situation. The detailed requirements for the ERP are described in Appendix C.

Table 26: Environmental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
Pre-Construction								
Land acquisition and compensation	Impacts on local people's life and economy	1. Develop an resettlement plan for the subproject with followed the approved resettlement policy framework of the project, ADB' SPS 2009 and relevant regulations of Vietnam governments and projects, such as: - Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Hanoi People's Committee. - Comply with the regulations of the Electricity Law, the Decree No.14/2014/ND-CP and relevant regulations. 2. Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations by strictly compliance with approved updated resettlement plan of Thanh Cong – Thuong Dinh subproject 3. Construct completely each work item to minimize the duration of temporary land use for the project construction. 4. Coordinate to address people's claims/grievances relating to compensation.	All affected persons in the subproject areas	Before implementing the subproject	See resettlement plan	See resettlement plan	IA/EO	Compensation and resettlement committee
UXO clearance (bombs, mines and other explosives)	Impact on people's and worker's safety	1. HANOI DPMB will need to engage an authorised 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 are already been cleared. 2. 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	All construction sites	At the beginning of the subproject construction	Once	See monitoring plan below	EO/IA	EO/GOV

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

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		+ Excavation, checked resolve signal to a depth of 5m 3. 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. 4. 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	1. The volume of broken bricks from the demolition of fences, asphalt concrete mass, surplus volume of levelling soil used in underground cable construction is collected and transported to the specified location by environmental company hired by Investor. Waste landfill of Lien Ha commune, Dan Phuong district, Hanoi about 19 km from the project site is planned to use. 2. Demolishing will not be conducted during peak hours, resting time of people around the area of construction project;. Dismantling units will restrict the activities emitting loud noise; establish a high iron fence around 2 - 2.5 m surrounding the demolition area to minimize dust emissions into the environment. Put signs of construction zoning area. 3. Contractors will obtain the license for safety and environmental requirements of mobilized machines and vehicles. 4. Selection of transportation route: The Contractor will consult with local authorities and design engineers in the selection of the most appropriate transportation route for transportation of equipment and materials to reduce negative impacts.	Subproject site	Before construction begins	01 time Before construction begins	No marginal cost	PO/PMB/PIC	PMB/contractors
Construction Phase								
Concentration of workers and domestic wastes	Generate domestic wastes causing environmental	1. Hire residents' houses for workers' staying. 2. Establish regulation, education and training of workers with hygiene awareness in the field. 3. Solid waste will be collected at the construction site and	All worker camps	Throughout construction phase	Monthly	No marginal cost	PO/ PIC/ construction supervisio	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
generated	pollution; generate social problems, spread diseases	the hired environment unit to transport to the landfill site at Lien Ha Commune, Dan Phuong district, Hanoi. 4. Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited. 5. Burning of construction and domestic wastes shall be prohibited 6. Examine periodically worker health. Equip medicine cabinet for protecting workers' health in time. 7. Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers. 8. Construction units will implement temporary residence registration for all construction workers to Ward PCs within the project area. They will also establish the relationship with the local authorities to discuss and take decisions necessary for their management 9. Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws. 10. Propagandize, educate workers and create good relations with people in order to avoid conflicts arising. HIV/AIDS education will be given to workers.it needs to comply with the Government of Viet Nam's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) (http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES) that govern the safe and orderly operation of civil works 11. 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.					n Consultant	
Excavated soil, debris, other hazardous wastes generated by	Cause soil and surface water pollution by refused soil, debris, other	1. Solid waste will be collected at the construction site and the hired environment unit to transport to the landfill site at Lien Ha Commune, Dan Phuong district, Hanoi. 2. After each working day waste, solid waste generated during underground cable construction is collected in	All construction sites	Throughout construction phase	Monthly	See Environmental Monitoring Plan	PO/ PIC/ construction supervision	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
excavation ofcable trenches, installation of cable and transportation means	hazardous wastes	containers or sacks. Then, gathered at the construction site, late day hired environment unit will collect and ship out of the construction area. 3. Max. salvage excavated soil, rock for filling cable trench, according to excavation and filling balance method. 4. For excavated soil which can not be reused, it will be collected and transported to the disposal site agreed by the local authorities through consultation with them. 5. Collect, salvage matters such as steel pieces, cement sacks, wooden barrels,… to reuse or sell. For other refused construction materials which can not be reused, hire local competent unit for collecting and transporting to the disposal site for burying along with rubbish. <u>Hazardous waste impact mitigation</u> Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp,etc. will be stored in 200 litter containing barrel, 20 litter plastic container, 2 layers PE packaging. At end of day, waste will be gathered at hazardous waste storage (about 10m2) of 220kV Thanh Cong substations,adjacent area of fence on the southwest direction of the substation.				(EMoP)	Consultant	
Construction activities and transportation of materials	Noise, dust and exhausts impact on ambient air environment quality	1. Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certify Construction units will frequently spray water at the construction sites and along the transport roads, particularly, Thuong Dinh, Vo Tong Phan, Lang, Yen Lang streets/roads. During the dry and hot days, spray minimum twice a day (6-7 am and 13-14pm) with specialized water tankers of 4.5m3. 2. Cover the material storage, setting up appropriate of mobilize material to the site to ensure that material will not obstruct at the site and release dust; 3. All material/waste storage shall be located at least 50 meters from any households and sensitive areas as mentioned above on Table 18 and waste will be transported from site within 24h; 4. Apply rolling construction method, and recover surface of	All construction sites	Beginning of construction (for license of equipment, machines and means) and throughout construction phase	Monthly	No marginal cost	PO/ PIC/ construction supervision Consultant	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		road or pavements right after construction activities completed on these sections; 5. Soil scattered on the paved road and public road shall be removed immediately 6. The trucks transporting construction materials and excavated soil will be covered by canvas. Planning and implementation of appropriate waste transportation, no transport during the day 7. All vehicles used for construction, and equipment and machines emitting noise, exhausts, fume will be maintained properly to minimize emission, and not operated at night if impossible to minimize noise. Only operate equipment, machines and vehicles causing large noise at day time..Undertaking the manual works/activities during nigh-time to avoid traffic conflicts						
Construction materials transportation, and storage	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	1. Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities 2. Layout reasonable construction schedule, to avoid the rush hour when construct underground cable at the intersection over Lang road, Moc sewer, Nguyen Trai road. 3. During construction of underground cable running along the Lang, Nguyen Trai Road, and construction only takes from 10 pm to 5 am of the following day. And arrange the manual works implement during nigh time to reduce traffic conflicts. Construction will be fast, strictly follow the working plan. 4. After digging trenches, pouring casting cable protection systems in accordance with design drawings, conduct backfilled immediately, restore the original road surface and pavements to ensure traffic movement on the main roads such as Hoang Cau, Thai Thinh II; Nguyen Ngoc Vu, new Khuong Dinh, Nguyen Trai streets; 5. Provide guide for traffic management during construction. The flag bearers will be assigned with the main responsibility to guide traffic movement in and around the construction site.	All construction sites.	Throughout construction phase	Monthly	No marginal cost	PO/ PIC/ construction supervision Consultant	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		6. Avoid working on the day of rain and storms. 7. Set up signal light when constructing at night. 8. Put up warning boards at dangerous road sections. 9. Speed limits will be posted and adhered to by transportation means. 10. Limit transportation of materials in rush-hours. 11. Transport materials with the allowable load. Not expand trucks' body. 12. For oversize and/or overweight materials and equipment, it must have special purpose transport means. 13. Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.						
Conduct switching, power connection in the process of expanding 02 bays and installing process of underground cables	Conduct a power cut during the installation and testing operation of underground cable, 02 bays 220kV Thanh Cong substations expanding construction will affect the production, trading, transportation, living ... area surrounding the project.	1. Conduct electricity cut only when performing the connection, power cut during the period 30-60 minutes (about 9 - 10 am or 3-4 pm). 2. Prepare specific, reasonable construction and power shutdown plan 3. Complete each construction phase Construction on schedule 4. Before cutting power for construction project: conducting announcement on mass media, organizing rotating power cuts, avoiding power cuts on peak-hour, power cuts only at connection points, limit power cutting on wide-ranging area.	All construction sites	Throughout construction phase	Monthly	No marginal cost	PO/ PIC/ construction supervision Consultant	Contractor
Excavation of trench for installation of underground cable	Water pipe incident and damage of underground infrastructure	1. During design, coordination with relevant agencies such as VIWASE, Hanoi water supply company, Hanoi drainage companies… to fully identify locations of existing underground facilities and development appropriate construction method to avoid impacts on these facilities; 2. As developed in the project documents, construction methods will be detail for each intersection points, such as at the location cross water supply the cable trench will						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		goes under the existing water pipeline, meanwhile, cable trench will cross over the concrete ditch of drainage water or other cable line system. 3. Select the appropriate cables and design standards of the project. 4. Do not bend cables or other sharp objects/equipment on cables. 5. Appoint professional staff to supervise the construction process. 6. When construction of underground cable the contractor must report to the management and operation unit of underground infrastructures for coordination. 7. Develop a plan for possible contingencies will be set up in which there is any broken facilities will be compensated by Contractor if any; 8. Road surface should be fully compensated as its origin after completion cable installation section						
Occupational health and safety of workers	Worker injury and health	1. Health and safety plan (HSP) will be prepared and implemented by the contractor. 2. All workers must be examined health, especially people working at deep trench, and equipped sufficiently labour protection tools. This must be strictly imposed. 3. All construction equipment, tools will be carefully examined for quality and quantity before used. For people working at depth, the installation of cables will be carefully checked before going to trench; no work at depth will be permitted when it is going dark; 4. Carefully check boom guy, cable clip before load heavy objects. 5. For trench excavation: Strictly implement safety measures while excavating cable trench. 6. Apply measures to consolidate the trench wall by pressing soil on the wall surface 7. Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation. 8. Strictly comply with safety norms for installation of	All construction sites.	Throughout construction phase (fulltime)	Monthly	No marginal cost	PO/ PIC/ construction supervision Consultant	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		electrical equipment and relative regulations. 9. Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment. 10. 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. 11. Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people without relative task must go out of the danger area. 12. Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location. 13. Contractors have to prepare emergency measures in 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.						
Community health and safety	Local people injury and health	1. Civil contractor will be required to develop a community health and safety plan. 2. Install barriers (temporary fence) at construction areas to deter people access to the site; 3. The local people shall not be allowed in high-risk areas (excavation sites and areas where heavy equipment is in operation); 4. Provide warning signs as noted in impacts on local traffic section; 5. When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting. 6. Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety to communities living near areas of	All construction sites.	Throughout construction phase (fulltime)	Monthly	No marginal cost	PO/ PIC/ construction supervision Consultant	Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		underground cable trench. 7. The contractor will be responsible to implement these measures,PMB will be responsible for including these requirements in the contract documents.						
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	1. Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by the subproject construction. 2. Require the Contractor within 30 days after the end of construction to dismantle, move all materials, components redundant, construction waste to designated location, which is planned waste dump at Lien Ha commune, Dan Phuong, Hanoi; to move machinery and equipment used in construction works out of construction site. 3. For the underground cable construction, cleaning and restoration of the ground on each construction phase. Ensure restore to the original state by at 5 am the next day. 4. The construction contractor will prepare regulation prohibiting the dumping of ground cleaning waste to the neighbourhood.	All construction sites.	throughout construction phase until the project is put into operation.	Monthly	No marginal cost	PO/ PIC/ construction supervision Consultant	Contractor
Operation phase								
Operation of underground cable	cable break incident	1. Within underground high-voltage electricity cable protection corridors, prohibits digging, piling, serving as landfill or discharging industrial waste water, which can cause corrosion damage. Investors will implement measures to protect the safety of cables and cable structures. 2. Maintain the drainage ditch on the cable routing area to avoid water pregnant that may cause water percolating into cable trench. 3. Where incidents occur cables are broken immediately notify the nearest power agency for handling measures: power cuts, technical staffing to inspect and repair.					The high voltage grid management of Hanoi City	
Occupational health and safety of the workers during the	Affect workers' health and safety	1. Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers.	ROW	Fulltime	Biannual	O and M	The high voltage grid management of Hanoi City	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
underground cable periodic maintenance process		(i)Adherence to electrical safety standards. (ii) Proper grounding transmission line. (iii) Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work Occupational EMF exposure will be minimized through the implementation of an EMF safety program that includes: + Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones + Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones. + Utilization of personal monitors during work activities. + Post safety signs and warning signs. 2. In addition, in the operation phase, conduct training for workers in order that they can respond to risks/failures and meet the operation procedures. An emergency and safety guideline needs to be prepared and disseminated to the workers for handling risks/failures occurring in the operation process. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the underground cable trench.						
Community Health and Safety		1. To prevent electrocution risk, Hanoi Power Company will implement the following: (i) To ensure absolute safety, operators must comply with operation procedures and safety requirements; (ii)Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the underground cable trench. (iii) Observe/Test EMF at resident's buildings for treating appropriately if any complaint. 2. To prevent impacts of EMF: the community will be warned about the safety distances from the underground cable trench through warning marks and prohibition of digging into the cable trench area.	ROW	Fulltime	Biannual	O and M	The high voltage grid management of Hanoi City	

GOV = Government of Viet Nam

B. Monitoring

Environment Effects Monitoring

169. The environmental effects monitoring plan for the EMP is provided inTable 27. The monitoring plan focuses on all three phases (pre-construction, construction and operation) of the subproject and consists of environmental indicators,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

170. The Contractor, particularly Environmental Safeguard officer of the Contractor will be responsible for the implementation of the environmental monitoring program. The ESU and EO will coordinate with the contractor. The PIC/PIU will provide logistical support to the Environmental Monitoring Consultant (EMC) of the Contractors where necessary for the implementation of environmental monitoring plan.

171. The standards for environmental quality Viet Nam listed in section III will guide the monitoring program. The environmental standards provided by the Environmental, Health and Safety Guidelines of the IFC/World Bank (2007) will be followed to supplement standards that are not provided by the Government of Viet Nam.

172. After construction is completed the potential impacts of the operation of the 110kV Thanh Cong-Thuong Dinh underground cable transmission line will be monitored by EVNHANOI.

Performance Monitoring

173. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized inTable 28.

Table 27: Environmental Effects Monitoring Plan

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD)
					Supervision	Implementation	
Pre-construction Phase							
A) Air quality and microclimate: dust, CO, NOx, SO_2, Noise B) Affected surface water quality: TSS, oil and grease, BOD_5, TDS, TP, TN	At SS site and underground cable line	Using field and analytical methods approved by DoNRE.	One measurement	One baseline supplement report before construction phase starts	PIC/ESU	EIA preparation consultant	Included in EIA preparation cost
Analysis of soil quality, heavy metals (Zn, Pb, As, Cu, Cd), oil and other plant protection chemicals	Possible contaminated lands at all excavation sites	Using analytical methods approved by DoNRE	One measurement	One baseline supplement report before construction phase starts	PIC/ESU	EIA preparation consultant	Included in EIA preparation cost
Construction Phase							
A) Air quality: dust, CO, NO_2, SO_2, Noise B) Affected surface water quality: TSS, oil and grease, BOD_5, TDS, TP, TN C) Quality of contaminated soil (Zn, Pb, As, Cu, Cd, and oil). D) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps. E) Public comments and complaints F) Incidence of worker or public accident or injury	A) At 4 monitoring points (at Thanh Cong SS, Moc bridge, Nguyen Trai Road and Khuong Dinh Road-300m from Thuong Dinh SS) B) At 2 monitoring points (at To Lich river near Moc bridge, at To Lich river -600m from Thuong Dinh SS) C) Possible contaminated lands at all excavation sites. D) All construction sites and worker camps E) Using hotline number placed at construction	A-C) Using field and analytical methods approved by DoNRE. Include visual observations of dust and noise from contractor and public reports. D) Visual observation E) Information transferred by telephone hotline number posted at all construction sites. F) regular reporting by contractors/ESU	A-B) Once during construction periods[9].Daily visual records C) Once at start of excavations D) Monthly E) Continuous public input F) Continuous	Monthly	(A-C):		
					ESU and CSC, PIC	Environmental Monitoring Consultant of contractor	The analysed cost is: A-B) USD 750 C) USD 2,000 (Source: VN EIA) Both will be included in the construction contract.
					(D-F) and daily observations:		
					EA/ESU and CSC, PIC	Contractor	No Marginal cost

[9] The construction period is about 6 month and the monitoring frequency requested in EIA approved by GOV is one time only.

	areas F) At all construction areas						
Operation Phase of 110 kV Thanh Cong-Thuong Dinh underground cable transmission line							
Incidence of worker accidents, or spills on hazardous materials, noise and EMF	At substation	Regular documentation and reporting	Continuous (except EMF for every month)		EVN HANOI /PPMB		O and M

Table 28: Performance Monitoring Indicators

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Land acquisition and compensation	Mentioned in Table 26	Mentioned in RP	Mentioned in RP	Resettlement Plan
UXO	Mentioned in Table 26	UXO disarmament	No risk of life safety of workers and people	Monitoring by PIC/Hanoi DPMB
Construction site arrangement	Mentioned in Table 26	- License of disposal - Transportation plan -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/ Hanoi DPMB
Construction Phase				
Concentration of workers and domestic wastes generated	Mentioned in Table 26	Hygiene situation, availability of toilet and waste basket Residential register of workers Educating and training about health and hygiene for workers	Rigorous program of domestic waste management implemented	Contractor monitoring reports,
Excavated soil, debrides, other hazardous wastes generated by excavation ofcable trenches, installation of cable and transportation means	Mentioned in Table 26	Solid waste and liquid waste treatment system Hazardous waste: Oil, gasoline, grease collection and treatment license	- Rigorous program of procedures to manage and store all waste from construction sites practiced, and manage earthworks. - Rigorous program of procedures to manage and store all waste from construction sites practiced.	Contractor monitoring reports,
Noise, dust and exhausts due to construction activities and	Mentioned in	dust, CO, NO_x, SO_2, noise levels meet Vietnamese standards	The parameters of air quality must not exceed the level at subproject	monitoring report of contractors

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
transportation of materials	Table 26		area. Complying with mitigation measures for dust, noise and hazardous gases	
Construction materials transportation, and storage	Mentioned in Table 26	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,
Conduct switching, power connection in the process of expanding 02 bays and installing process of underground cables	Mentioned in Table 26	Number and duration of cut of is minimized	Ensure the normal production, trading, transportation, living condition of local people at the surrounding subproject area.	Complaints from local people
Excavation of trench for installation of underground cable	Mentioned in Table 26	Number of water pipe incident and damage of underground infrastructure is limited	Underground infrastructures will be protected, no damage will be occurred	report of contractors
Community and worker safety	Mentioned in Table 26	Frequency of injuries are reduced	Adherence to GoV occupational health and Safety regulations	Contractor reports
Repair, restore, return the ground after construction completion	Mentioned in Table 26	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 monitoring reports
Operation phase of underground cable transmission line				
Maintenance of underground cable area	Mentioned in Table 26	Frequency of accidents, and damage is reduced Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHANOI reports
Prevention of cable break incident	Mentioned in Table 26	Number of cable break incident is reduced	In compliance to GoV regulations on noise, EMF and fire prevention	EVNHANOI reports
Occupational health and safety	Mentioned in	Frequency of injuries are reduced	Adherence to GoV occupational	EVNHANOI reports

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
of the workers during the TL periodic maintenance process	Table 26		health and Safety regulations	
Community Health and Safety	Mentioned in Table 26	Frequency of injuries are reduced	Adherence to GoV occupational health and Safety regulations	EVNHANOI reports

Reporting

174. Regular reporting on the implementation of mitigation measures and on monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of IA/ESU. The proposed timing of reporting is from starting construction time-April 2017 to the end of construction phase which is on monthly basis. The contractor/construction supervision consultant has to submit monthly report to the Project owner.

The Project owner with assistance of PIC compiles monthly reports provided by the contractor to prepare semi-annual environmental report to submit to ADB.

C. Implementation Arrangements

Institutional arrangements and responsibilities

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

- **Electricity of Vietnam Hanoi (EVN HANOI)**is the Executing Agency which takes ultimate responsibility for overseeing the successful implementation of the environmental safeguards for the subprojects as required by both Viet Mam and the ADB.
- **Hanoi Power Management Board (PPMB)**which is a subsidiary of EVN HANOI is the Implementing Agency (IA) 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)[10].Hanoi PPMB has dedicated 2 personnel for the Environmental and Social Unit (ESU) which is responsible for all environmental and social safeguard activities. IA 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. IA 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.
- **Hanoi PPMB'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 the SPS. The ESU will prepare and submit the REA checklist, and IEE and monitoring reports to ADB for review.The ESU/IA works closely with the PIC to implement the EMP for each non-core project.The ESU also supervises and monitors the implementation of the CEMP by the environmental officer (EO) of the contractor.
- **The Project Implementation Consultant (PIC):**Assist EVN/PMB in preparation of IEEs for noncore subprojects and in monitoring and evaluation of safeguards compliance
- **The Contractor** and **the Environmental Officer (EO) of the Contractor** will make plans necessary for the implementation of the EMP as required and ensure strict implementation of the mitigation measures outlined in the EMP.
- **Environmental Monitoring Consultant (EMC):** 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 IA/ESU.
- **Local governments and communities** are responsible for monitoring the implementation of the EMP as brought forward in the commitment of the Contractor.

[10]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 >

- **The Department of Natural Resources and Environment (DoNRE)** is the provincial agency which oversees environmental management of Hanoi. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of the Law on Environmental Protection (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 the PPMB and will disclose the reports on its website. If the PPMB fails to meet safeguards requirements described in the EMP, ADB will seek corrective measures and advise the PPMB on items in need of follow-up actions.

176. The specific responsibilities of the parties concerned are indicated in the Table 29:

Table 29: Stakeholder's responsibilities

Stakeholder	Responsibilities
Electricity of Vietnam	- General oversight role in the construction phase - Overall responsibility for the implementation of the EMP during operational phase
Hanoi Power Management Board	- 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 SEMP and approving the SEMP
	- 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	- 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 PPMB
	- Ensure adequate education and training to all staff related to environmental supervision
	- Provide recommendations on EMP performance to PPMB
Project Implementation Consultant (PIC)	- Assist EVN/PPMB 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 SEMP preparation
Contractor and Environmental Officer (EO) of Contractor	- Prepare SEMP and keep records and necessary data as required in EMP and submit to Construction Supervision Consultant
	- Ensure that workers are informed of purposes of EMP and aware of necessary measures to implement EMP

Stakeholder	Responsibilities
	- Prepare and submit monthly reports on any environmental issue, and on implementation of the SEMP at the construction site.
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 ESU/IA/EO. - Perform required laboratory analyses for monitoring program detailed in EMP; and - Prepare and submit quarterly reports to IA/ESU on monitoring activities.
Local authority and community	- Participate in monitoring EMP implementation

Institutional Capacity Review and Needs

177. Currently there is insufficient experience and capacity for environmental assessment and management in EVNHANOI for the implementation of the EMP, and to develop future safeguards document for the non-core subprojects. The PIC with assistance from the ESU/IA of the subproject will develop and deliver training courses to the IA staff including the EO 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.

178. 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.

Estimated Cost

179. 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 30 (Environmental Effect Monitoring) the preliminary cost for the implementation of the EMP for the subproject is summarized in Table 30.

Table 30: Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre-construction Phase	
Environmental quality monitoring (baseline sampling program)	Included in the EIA cost
Construction Phase	
Environmental effects monitoring	**USD 750** (included in the construction contract of contractor)
Inspecting environmental compliance	No marginal cost. It is included in the construction supervision Consultant's contract
Monitoring activities in case of environmental emergency (oil spill, fire, accidents, etc.)	**USD 2,000** (included in the construction contract of contractor)
Operation Phase	
Monitoring environmental quality (electromagnetic measurement)	No marginal cost. It is included in the operation budget of the substation
Public input	No marginal cost

180. Thus, the cost for EMP is USD 2,750 for environmental effects monitoring and monitoring activities in case of environmental emergency. Other monitoring cost is included in the working contracts of all units.

XI. CONCLUSIONS AND RECOMMENDATION

181. The initial environmental examination of 110kV Thanh Cong-Thuong Dinh underground cable transmission line in Hanoi indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

182. The civil construction impacts of elevated dust, noise, traffic disruptions, and public facilities damage and worker safety are assessed as little and can be managed effectively with standard construction practices.

183. The public consultation meetings underscored the need for effective management of construction impacts such as noise, dust, traffic disruptions, and public safety as indicated in EMP. Especially, the public concerns were raised on ensuring mitigation measures of the contractor, as well as the responsibilities of involved parties in cases of incidents and damage to property and threatening people's safety; The safe operation of the substation and transmission line were significantly focused by local residents.

184. 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 those new sensitive environmental components are not identified in pre-construction phase, further detailed environmental impact assessment of the subproject is not required.

REFERENCE CITED

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General Statistics Office, 2013. Hanoi City Statistical Yearbook 2013.

Hanoi PPMU, 2014.EIA report for the project “110kV Thanh Cong-Thuong Dinh underground cable transmission line”.Institute of Physicals- Viet Nam Science and Technology Academy Environmental Science and Engineering (IESE), 2015

APPENDICES

A. Rapid Environmental Assessment (REA) Checklist

B. Minutes of Public Consultation Meetings, Hanoi

C. 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

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	
Protected Area		X	
Wetland		X	
Mangrove		X	
Estuarine		X	
Buffer zone of protected area		X	
Special area for protecting biodiversity		X	
B. Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	
▪ Encroachment on precious ecosystem (e.g. sensitive or protected areas)?		x	

Screening Questions	Yes	No	Remarks
▪ 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	
▪ damage to sensitive coastal/marine habitats by construction of underground cables?		x	The underground cables are not located in the sensitive coastal/marine habitats
▪ 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 on To Lich river. No chemicals used in construction mitigation measures will be implemented.
▪ increased local air pollution due to rock crushing, cutting and filling?		x	Low level. There is no rock crushing, cutting in the project. 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	
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?		x	
▪ noise and vibration due to blasting and other civil works?		x	No blasting. Medium impact level due to noise and vibration occurred during road cutting and 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 project affects farming land for rice, tea and aquaculture without houses/accommodations. Required compensation for land loss is addressed by RDDD for subproject.
▪ dis-proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	No ethnic minority groups in the subproject area

Screening Questions	Yes	No	Remarks
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	x		Small impacts. Noise and dust from excavation and construction works will have insignificant impacts on household who are living nearby. However, the Project owner, contractors will implement the proposed mitigation measures such as: no transport in rush hours, repair damaged road after the construction etc.
▪ hazardous driving conditions where construction interferes with pre-existing roads?	x		Small impact. The digging cable ditches on road ways and increase of project heavy trucks can cause risk in traffic accident. However,mitigation measures, and ensuring safety will be taken strictly, assailing, set the speed control signs, traffic regulation etc.
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		x	
▪ dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		x	No displacement due to construction of underground cable TL
▪ environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?		x	
▪ facilitation of access to protected areas in case corridors traverse protected areas?		x	No protected areas within 10 km of the project area
▪ disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		x	
▪ large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	No impact. Only 25 workers work in the subproject area
▪ social conflicts if workers from other regions or countries are hired?		x	No impact. All workers are Vietnamese. Workers from other regions or countries are not hired

Screening Questions	Yes	No	Remarks
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	x		Small impact.Since the number of workers is small, no worker camps are built but hired local houses. However, the Contractor shall implement measures to ensure the hygiene and health of workers and local people, such as hiring hygiene sufficient accommodation, and hiring specialized units to collect waste daily.
▪ risks to community safety associated with maintenance of lines and related facilities?	x		
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?	x		Minor impact. No land subsidence, lowered groundwater table, and salinization would be happed. Electromagnetic fields occur in operation phase- Electromagnetic field of the substation will not affected surrounding communities.
▪ 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 minimal risk that accidents could happen but 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 project(e.g., high voltage wires, and underground cable transmission lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	x		Low risk level. There is no transmission line. Also, in the process of maintenance, the operate unit will conduct regular inspection for timely detection and treatment.

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?		x	The project area is located in an elevated area which is 0.4m higher than ground and the risk of flooding is minimal. The underground cable transmission line construction will be affected by temporary flooding.
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		x	
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		x	
• Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?		x	

APPENDIX B: Minutes of Public Consultation Meetings

Scanned copies of minutes and list of participants

DỰ ÁN XÂY DỰNG TUYẾN CÁP NGẦM 110KV THÀNH CÔNG – THƯỢNG ĐÌNH VÀ MỞ RỘNG TBA 220KV THÀNH CÔNG

BIÊN BẢN THAM VẤN CỘNG ĐỒNG

(Tham vấn các cơ quan)

I. Thời gian và địa điểm tham vấn

1. **Thời gian**: Ngày 19 tháng 03 năm 2016.
2. **Địa điểm**: ....UBND Phường Hạ Đình..... Thành phố Hà Nội.

II. Thành phần tham dự

1. Đại diện UBND phường ...Hạ Đình.....

- Ông: ..Thái Minh Tuấn..... Chức vụ: ...Phó CT UBND Phường..
- Ông/Bà: ..Đinh Thị Hồng Trâm.. Chức vụ: ..Cán bộ địa thị.....
- Ông: ..... Chức vụ: .....
- Ông: ..... Chức vụ: .....

2. Đại diện nhóm tham vấn

- Ông: ..Lê Bá Thụy..... Chức vụ: ..Chuyên gia Đất đai cấp
- Ông: ..Vũ Chí Công..... Chức vụ: ..Chuyên gia môi trường
- Ông: Nguyễn Văn Bằng..... Chức vụ: ..Cán bộ hỗ trợ.....
- Ông: ..... Chức vụ: .....

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III. Mục đích và nội dung tham vấn

1. Mục đích

(i) Giới thiệu và phổ biến thông tin về dự án đến chính quyền địa phương và các hộ dân bị ảnh hưởng bởi dự án và các nguyên tắc về bồi thường, hỗ trợ; yêu cầu và mục tiêu của việc lập Kế hoạch Bồi thường và hỗ trợ cho Dự án "xây dựng tuyến cáp ngầm 110Kv Thành Công – Thượng Đình và mở rộng TBA 220Kv Thành Công".

(ii) Thu thập ý kiến, nguyện vọng của các chính quyền địa phương và các hộ dân liên quan đến bồi thường, hỗ trợ, vấn đề về giới và nhóm dễ bị tổn thương, và tham vấn các biện pháp/chương trình phục hồi thu nhập cho người bị ảnh hưởng (nếu có).

2. Nội dung

a. Nhóm tham vấn giới thiệu và trình bày về dự án, mục đích và các nội dung tham vấn;
b. Thảo luận, lấy ý kiến tham gia của những người tham dự và những giải thích của nhóm tham vấn.

3. Tóm tắt kết quả tham vấn và ý kiến của những người tham dự

a. Các câu hỏi và các ý kiến thảo luận:

.1). Nguyễn Văn Tích (Bí thư chi bộ khu dân cư số 1), Bùi Đình Toại...

(Trưởng ban công tác mặt trận):
- Trong quá trình thi công khắc phục đường đi lại, vệ sinh môi trường đảm bảo cho người dân.
- Đồng ý với dự án nhưng thi công phải gọn, hoàn trả hiện trạng mặt bằng như trước khi thi công, tránh ảnh hưởng tới đường thoát nước của các hộ dân ra sông.
+) Vũ Đình Kiểu (bí thư chi bộ khu dân cư số 2)
- Đồng ý với thi công nhưng phải nhanh gọn, đảm bảo an toàn giao thông, chú ý tránh các đường nước, có đèn cảnh báo, có cầu bắc cho nhà dân ra đường đi lại.
- Khi dự án được triển khai, cần quản lí công nhân chặt chẽ đảm bảo an ninh trật tự cho các hộ dân trong khu vực dự án.
+) Đinh Thị Hồng Trâm (Cán bộ đô thị)
- Đồng ý với dự án nhưng trước khi thi công phải có thông báo tới chính quyền địa phương để có thông tin cả thông báo tới các khu dân cư.
- Thi công đảm bảo an toàn kĩ thuật, vệ sinh sạch sẽ, nhanh gọn.
- Tập kết vật liệu đúng quy định, tránh ảnh hưởng tới giao thông của người dân.
- Nhà thầu cần lưu ý các công trình ngầm trên đoạn tuyến thuộc địa bàn phường trong quá trình thi công.
- Đề nghị nhà thầu phối hợp tốt với Ủy ban nhân dân phường để xử lý các sự cố môi trường nếu có, phải đảm bảo các hồ sơ, tài liệu, thủ tục về môi trường trước khi thi công.

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b. Một số ý kiến khác:

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Biên bản kết thúc cùng ngày và đã được cuộc họp nhất trí thông qua.

Xác nhận của UBND Phường Hạ Đình

Nhóm tham vấn

Lê Đức Tùng

PHÓ CHỦ TỊCH

Thái Minh Tuấn

Nguyễn Văn Tiến

Bùi Đình Toại

UỶ BAN NHÂN DÂN **PHƯỜNG THƯỢNG ĐÌNH** Số: 89 /UBND	**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM** **Độc lập – Tự do – Hạnh phúc**
Về việc tham gia ý kiến đánh giá tác động môi trường của Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình.	*Thượng Đình, ngày 15 tháng 5 năm 2015*

Kính gửi: Ban Quản lý Dự án Phát triển Điện lực Hà Nội

Ủy ban nhân dân phường Thượng Đình đã nhận được Công văn số 568/HANOI DPMB-KHVT ngày 22 tháng 4 năm 2015 của Ban Quản lý Dự án Phát triển Điện lực Hà Nội về việc tham vấn ý kiến phường Thượng Đình thuộc phạm vi Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình, kèm theo tài liệu tóm tắt về các hạng mục đầu tư chính, các vấn đề môi trường, các giải pháp bảo vệ môi trường của Dự án. Sau khi xem xét tài liệu, UBND phường Thượng Đình có ý kiến như sau:

1. Về những tác động xấu của Dự án đến môi trường tự nhiên và KT-XH:

Chủ đầu tư đã dự báo được những tác động xấu tới môi trường trong từng giai đoạn của Dự án. Các tác động xấu tới môi trường đã được Chủ đầu tư trình bày và đánh giá theo các phương pháp áp dụng trong báo cáo đánh giá tác động môi trường. Đây là những tác động không thể tránh khỏi trong quá trình triển khai, thi công Dự án.

2. Về các biện pháp giảm thiểu tác động môi trường của Dự án:

Chủ đầu tư đã trình bày được các biện pháp giảm thiểu để hạn chế những tác động xấu tới môi trường trong các giai đoạn triển khai Dự án. Các biện pháp đưa ra có tính khả thi cao. UBND phường Thượng Đình đồng ý với giải pháp đã đề ra của Chủ đầu tư.

3. Kiến nghị đối với Chủ đầu tư:

(1). Đề nghị Chủ đầu tư nghiêm túc thực hiện những biện pháp giảm thiểu, hạn chế tối đa nhất những tác động xấu tới môi trường do Dự án phát sinh ra.

(2). Khi có sự cố xảy ra, Chủ đầu tư phải thông báo ngay tới các cơ quan địa phương để cùng phối hợp khắc phục do Dự án xảy ra.

Trên đây là ý kiến của UBND phường Thượng Đình gửi Ban Quản lý Dự án Phát triển Điện lực Hà Nội để xem xét, hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:
- Như trên;
- Lưu VP.

TM. UỶ BAN NHÂN DÂN
KT. CHỦ TỊCH

PHÓ CHỦ TỊCH

Trần Phan Mỹ

UỶ BAN NHÂN DÂN **PHƯỜNG NHÂN CHÍNH** Số: 179 /UBND	**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM** **Độc lập – Tự do – Hạnh phúc**
Về việc tham gia ý kiến đánh giá tác động môi trường của Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình đi qua địa bàn phường.	*Nhân Chính, ngày 05 tháng 5 năm 2015*

Kính gửi: Ban Quản lý Dự án Phát triển Điện lực Hà Nội.

UBND phường nhận được văn bản số 568/HANOI DPMB-KHVT ngày 22/4/2015 của Ban Quản lý Dự án Phát triển Điện lực Hà Nội về việc tham vấn ý kiến đánh giá tác động môi trường của Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình, kèm theo tài liệu tóm tắt về các hạng mục đầu tư chính, các vấn đề môi trường, các giải pháp bảo vệ môi trường của Dự án. Sau khi xem xét tài liệu, UBND phường có một số ý kiến sau:

1. Về vấn đề tác động xấu của Dự án đến môi trường

Về cơ bản Chủ đầu tư đã dự báo được những tác động xấu tới môi trường trong từng giai đoạn của Dự án. Những tác động xấu tới môi trường đã được trình bày và đánh giá theo các phương pháp trong tài liệu tóm tắt về các hạng mục đầu tư chính, các vấn đề môi trường, các giải pháp bảo vệ môi trường của Dự án.

2. Về các biện pháp giảm thiểu tác động môi trường của Dự án

Các biện pháp giảm thiểu những tác động xấu tới môi trường đã được Chủ đầu tư trình bày trên cơ sở điều kiện tình hình thực tế nơi đặt Dự án. UBND phường về cơ bản thống nhất với giải pháp do Chủ đầu tư đề ra.

3. Kiến nghị đối với Chủ đầu tư

3.1. Đề nghị Chủ đầu tư liên hệ làm việc với các cơ quan chức năng để được phê duyệt các nội dung liên quan đến vấn đề bảo vệ môi trường; tổ chức thực hiện nghiêm túc những biện pháp giảm thiểu, hạn chế tối đa nhất những tác động xấu tới môi trường do Dự án phát sinh ra.

3.2. Trước khi triển khai thi công Dự án, đề nghị chủ đầu tư tuân thủ đúng các quy định của pháp luật; thông báo công khai chi tiết tiến độ thực hiện Dự án và phối hợp với các cơ quan địa phương liên quan trong công tác triển khai Dự án.

3.3. Khi có sự cố xảy ra, chủ đầu tư là đơn vị chịu trách nhiệm trước tiên; kịp thời thông báo tới các cơ quan chức năng liên quan và phối hợp với chính quyền địa phương để cùng giải quyết đạt hiệu quả.

Trên đây là một số ý kiến của UBND phường gửi Ban Quản lý Dự án Phát triển Điện lực Hà Nội xem xét, hoàn chỉnh báo cáo đánh giá tác động môi trường trước khi triển khai thực hiện Dự án đảm bảo đúng quy định của pháp luật./.

Nơi nhận: - Như trên; - Lưu: VP.	**TM. UỶ BAN NHÂN DÂN** **CHỦ TỊCH** **Hoàng Trung Thành**

UỶ BAN NHÂN DÂN **PHƯỜNG THỊNH QUANG** Số: 48 /UBND	**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM** **Độc lập – Tự do – Hạnh phúc**
Về việc tham gia ý kiến đánh giá tác động môi trường của Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình.	*Thịnh Quang, ngày 07 tháng 5 năm 2015*

Kính gửi: Ban Quản lý Dự án Phát triển Điện lực Hà Nội

Ủy ban nhân dân phường Thịnh Quang đã nhận được Công văn số 568/HANOI DPMB-KHVT ngày 22 tháng 4 năm 2015 của Ban Quản lý Dự án Phát triển Điện lực Hà Nội về việc tham vấn ý kiến phường Thịnh Quang thuộc phạm vi Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình, kèm theo tài liệu tóm tắt về các hạng mục đầu tư chính, các vấn đề môi trường, các giải pháp bảo vệ môi trường của Dự án. Sau khi xem xét tài liệu, UBND phường Thịnh Quang có ý kiến như sau:

1. Về những tác động xấu của Dự án đến môi trường tự nhiên và KT-XH:

Chủ đầu tư đã dự báo được những tác động xấu tới môi trường trong các giai đoạn của dự án. UBND phường Thịnh Quang đồng ý với các nội dung được trình bày trong tài liệu gửi kèm.

2. Về các biện pháp giảm thiểu tác động môi trường của Dự án:

Các biện pháp giảm thiểu những tác động xấu tới môi trường đã được Chủ đầu tư đã trình bày đầy đủ, phù hợp và có tính khả thi

3. Kiến nghị đối với Chủ đầu tư:

(1). Đề nghị Chủ đầu tư nghiêm túc thực hiện những biện pháp giảm thiểu, hạn chế tối đa nhất những tác động xấu tới môi trường do Dự án phát sinh ra.

(2). Khi có sự cố xảy ra, Chủ đầu tư phải thông báo ngay tới các cơ quan địa phương để cùng phối hợp khắc phục do Dự án xảy ra.

(3). Trước khi triển khai thi công Dự án, đề nghị Chủ đầu tư tuân thủ đúng các quy định của pháp luật; thông báo công khai chi tiết tiến độ thực hiện Dự án và phối hợp với cơ quan địa phương liên quan trong công tác triển khai Dự án.

Trên đây là ý kiến của UBND phường Thịnh Quang gửi Ban Quản lý Dự án Phát triển Điện lực Hà Nội để xem xét, hoàn chỉnh báo cáo đánh giá tác động môi trường của Dự án./.

Nơi nhận:
- Như trên;
- Lưu VP.

TM. UỶ BAN NHÂN DÂN

UỶ BAN NHÂN DÂN **PHƯỜNG LÁNG HẠ**	**CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM** **Độc lập - Tự do - Hạnh phúc**
Số: 424/UBND-VP Về việc tham gia ý kiến đánh giá tác động môi trường của Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình.	*Láng Hạ, ngày 4 tháng 5 năm 2015*

Kính gửi: Ban Quản lý Dự án Phát triển Điện lực Hà Nội

Ủy ban nhân dân phường Láng Hạ đã nhận được Công văn số 568/HANOI DPMB-KHVT ngày 22 tháng 4 năm 2015 của Ban Quản lý Dự án Phát triển Điện lực Hà Nội về việc tham vấn ý kiến phường Láng Hạ thuộc phạm vi Dự án Tuyến cáp ngầm 110kV Thành Công – Thượng Đình, kèm theo tài liệu tóm tắt về các hạng mục đầu tư chính, các vấn đề môi trường, các giải pháp bảo vệ môi trường của Dự án. Sau khi xem xét tài liệu và các căn cứ pháp lý do Ban Quản lý Dự án Phát triển Điện lực Hà Nội cung cấp, UBND phường Láng Hạ có ý kiến như sau:

1. Về những tác động xấu của Dự án đến môi trường tự nhiên và KT-XH:

Chủ đầu tư đã dự báo được những tác động xấu tới môi trường trong giai đoạn xây dựng và trong giai đoạn Dự án đi vào hoạt động. UBND phường Láng Hạ đồng ý với các nội dung được trình bày trong tài liệu gửi kèm.

2. Về các biện pháp giảm thiểu tác động môi trường của Dự án:

Chủ đầu tư đã trình bày được các biện pháp giảm thiểu để hạn chế những tác động xấu tới môi trường trong các giai đoạn triển khai Dự án. Nhìn chung các biện pháp đưa ra có tính khả thi cao. UBND phường Láng Hạ đồng ý với giải pháp đã đề ra của Chủ đầu tư.

Ngoài ra cần lưu ý các vấn đề sau:

- *Tác động môi trường không khí, tác động đến sức khỏe cộng đồng và các hoạt động kinh tế - xã hội;* Do đây là khu vực có mật độ dân cư cao, việc tưới nước làm ẩm hạn chế phát tán bụi cần được tăng cường trong suốt quá trình dự án.
- *Tác động tới giao thông*: Cần tăng cường việc bố trí người điều khiển giao thông trong những giờ cao điểm.
- *Tác động xã hội:* Cần phối hợp với Chính quyền, Công an địa phương thực hiện nghiêm chỉnh quy định về tạm trú, đảm bảo an ninh trật tự.

- *Tác động tới an toàn lao động*: Đảm bảo an toàn lao động cả trong và ng
công trường thi công.

3. Kiến nghị đối với Chủ đầu tư:

- Đề nghị Chủ đầu tư thông báo công khai chi tiết tiến độ thực hiện Dự
và phối hợp với các cơ quan địa phương liên quan trong công tác triển khai
án. Trong quá trình triển khai Dự án, Chủ đầu tư cam kết, sử dụng các trang th
bị, máy móc thi công và biện pháp thi công tiên tiến, đảm bảo các tiêu chu
theo quy định hiện hành của pháp luật, đảm bảo an toàn, chất lượng cũng n
tiến độ dự án đặt ra, nghiêm túc thực hiện những biện pháp giảm thiểu, hạn
tối đa nhất những tác động xấu tới môi trường do Dự án phát sinh ra.

- Khi có sự cố xảy ra, Chủ đầu tư phải thông báo ngay tới các cơ quan
phương để cùng phối hợp khắc phục.

Trên đây là ý kiến của UBND phường Láng Hạ gửi Ban Quản lý Dự án Đ
triển Điện lực Hà Nội để xem xét, hoàn chỉnh báo cáo đánh giá tác động n
trường của Dự án./.

Nơi nhận:
- Như trên;
- Lưu VP.

TM. UỶ BAN NHÂN DÂN
KT.CHỦ TỊCH
PHÓ CHỦ TỊCH

Bạch Quang Trung

APPENDIX C: 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	Solves the emergency/incident

Response Team (EERT)	
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 31: 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 further notice.	Follow evacuation procedure

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