Initial Environmental Examination

Project Number: 46391-001
March 2016

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

Prepared by Ha Noi Power Corporation for the Asian Development Bank.

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LOANS 3161/8286-VIE: HANOI AND HOCHIMINH CITY POWER GRID DEVELOPMENT SECTOR PROJECT

Subproject: 110kV Phu Nghia Substation and Transmission Line

Prepared by Ha Noi Power Corporation for the Asian Development Bank

NOTE

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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
EMP:	Environment Management Plan
EO:	Environmental Officer (of PMB)
ESU:	Environmental and Social Unit
EVN:	Electricity of Viet Nam
EVN HANOI:	Ha Noi Power Corporation
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
HN:	Ha Noi
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

CURRENCY EQUIVALENTS

(As of 15 September2015)

Currency Unit	-	Vietnam Dong VND
1.00 VND	=	$ 0.000046
$1,00	=	22.400

WEIGHTS AND MEASURES

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

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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 Ha Noi 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 Phu Nghia110 kV Substation, in Phu Nghia Commune, Chuong My District, Ha Noi City and a 11,1km long transmission line Phu Nghia – Xuan Mai traversing 6 communes in Chuong My and Quoc Oai District. This represents one of the non- core subprojects that were identified by Electricity of Viet Nam (EVN) for Ha Noi. The IEEs of other non-core subprojects[1] are being prepared separately.

A. Subproject Summary

3. The subproject consists 03 components 1) construction of Phu Nghia substation on an area of 6110m^2 in Phu Nghia Commune, Chuong My District, Ha Noi within Phu Nghia Industrial Park that does not require land acquisition and resettlement; 2) installation of Phu Nghia-Xuan Mai transmission line of 11.8 km long travelling through communes: Hoa Thach, Can Huu, Dong Yen of Quoc Oai District and Dong Son, Dong Phuong Yen, Phu Nghia of Chuong My District; and (3) installation of 02 new 220kV feeder bay in Xuan Mai 220kV substation in Hoa Thach commune, Quoc Oai District, Ha Noi.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

4. The IEE of the Phu Nghia 110 kV substation 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., IFC/World Bank 2007). There are no rare or endangered wildlife, critical habitat, or protected areas in the subproject sites which are located in developed urban Ha Noi.

5. The subproject will result in permanent loss of 256,355m^2, in which land is permanently acquired 11,807.52 m^2 (including 6110m^2 in the industrial park for Phu Nghia 110KV substation and 5,697.52m^2 for building 52 tower foundations); the temporarily acquired area is 67,409m^2 for construction and the safety corridor is 177,138m^2. The total number of households affected by the project are 64. Details of the compensation and ground clearance are shown in the report for compensation and resettlement of the project.

6. There are no expected negative 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 IA/ESU 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 110 kV Phu Nghia 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.

[1]The non-core subprojects were developed by EVN to follow implementation of the higher priority core subprojects

II. INTRODUCTION

A. Background to IEE

9. The goal of the Ha Noi and Ho Chi Minh City Power Grid Development Sector Project is to strengthen the capacity and reliability of the power infrastructure in Ha Noi 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 Ha Noi 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 Phu Nghia110kV Substation and 110kV transmision 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.

B. Assessment Context

11. The overall Project was assigned Environmental Category B pursuant to the ADB's Safeguard Policy[2] and recent good practice sourcebook guidance[3]. 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[4]. The IEE was prepared for the Phu Nghia and 110kV 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.

12. The detailed design for the Phu Nghia subproject will follow subproject approval. The Environmental Management Plan (EMP) that has been prepared for the subproject (Section IX) will need to be updated where necessary to meet the final detailed designs of the Phu Nghia substation subproject.

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

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

13. The Phu Nghia subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by GoV Decree No.131/2006/ND-CP which was promulgated November 9, 2006, and in accordance with the provisions of for the parent sector project.

A. Viet Nam Regulatory Framework for Environmental Assessment

14. The Viet Nam Law on Environmental Protection (LEP2014) prescribes the requirements for environmental assessment (EA) for development and domestic project interventions that affect the natural and social environments; Government Decree 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 18 both elaborate the EA requirements specified by the LEP (2014).

15. The updated screening criteria of Decree 18 distinguish projects that require an Environmental Impact Assessment (EIA) from projects requiring the simpler Environmental Management Plan (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 18 requires that an EIA be prepared for the Phu Nghia subproject.

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

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

Environmental Protection regulations

- Law on Environmental Protection by the National Assembly on June 23, 2014 (Law No. 55/2014/QH13);
- Decree No. 38/2015/NĐ-CP date April 24, 2015 of the Goverment on Management of waste and discarded materials;
- Decree No.18/2015/ND-CP dated February 14, 2015 on environmental protection masterplan, strategic environmental assessment, environmental impact assessment and environmental management plan;
- Decree No. 19/2015/ND-CP dated February 14, 2015 of the government on detailing the implementation of some Articles of the Law on Environmental Protection;
- Circular No. 32/2013/TT-BTNMT dated October 25, 2013 by Ministry of Natural Resources and Environment promulgating national technical regulations on environment;
- Circular No.36/2015/TT-BTNMT dated June 30, 2015 on hazardous waste management;
- Circular No.27/2015/TT-BTNMT dated May 29, 2015 of the Ministry of Natural Resources and Environment on environmental protection masterplan, strategic environmental assessment, environmental impact assessment and environmental management plan

Legal documents on electricity

- Electricity Law No. 28/2004/QH11, issued on 03 December2004;
- Supplemented Electricity Law No. 24/2012/QH13 by the National Assembly of the Socialist Republic of Vietnam dated November 20, 2012;
- Decree No.14/2014/ND-CP dated February 26, 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 dated June 15, 2010 of the Government stipulating sanctions in the field of electricity;
- Circular No.31/2014/TT-BCT dated Oct. 2nd, 2014 issued by the Ministry of Industry and Trade (MOIT) regarding the detailed regulation on some contents of electrical safety.

Other relative legal documents:

- Decree No. 45/2013/ND-CP dated May 10th, 2013 of the GOV regarding the detailed regulation on some articles of the Labor Code on working hours, rest hours, occupational safety and occupational hygiene.

- Circular No.22/2010/TT-BXD dated Dec. 3rd, 2010 issued by the Ministry of Construction (MOC) regarding the regulation on labour safety during the project construction process.
- Decision No.3733/2002/QD-BYT issued by the Ministry of Health dated October 10th, 2002 regarding the promulgation of 21 labor hygiene standards, 5 principles and 7 labor hygiene measurements.

Environmental Standards and Regulations

- QCVN 05:2009/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 08:2008/BTNMT - National technical regulation on surface water quality.
- QCVN 09:2008/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.

International Guidelines

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

Project related Documents

- Decision No.4351/QD-BTC of the Ministry of Industry and Commerce dated August 20, 2011 approving the plan for power development in Hanoi in 2011 - 2015 period with vision to 2020;
- Decision No.3372/QD-UBND of the Hanoi People's Committee dated July 25, 2012 approving Chuong My power development masterplan for 2011-2015 with consideration of 2020;
- Official Letter No.3497/QHKT-P7 dated November 14, 2012 of Hanoi Department of Architectural Planning on construction site for Phu Nghia 110kV substation (with attached location map).
- Official Letter No.1337/QHKT-P7 dated May 13, 2013 of Hanoi Department of Architectural Planning on the alignment of 110kV Phu Nghia - Xuan Mai transmission line (supplying power to 110kV Phu Nghia substation).
- Official Letter No.3832/UBND-CT dated May 29, 2013 of Hanoi People's Committee on the alignment of 110kV Phu Nghia - Xuan Mai transmission line;
- Alignment map of 110kV Phu Nghia - Xuan Mai transmission line by Hanoi Institute of Construction Planning made in September20, 2013.
- Official Letter No.1359/VQH-TT5 dated September 04, 2013 on providing technical data for Phu Nghia 110kV Substation project.
- Official Letter No.326/QHKT-P7 dated January 22, 2014 of Hanoi Department of Architectural Planning on approving the layout and architectural plan for 110kV Phu Nghia Substation.
- Decision No. 4462/QD-EVNHANOI dated 13/06/2011 of the General Director of Electricity of Hanoi on approving the technical plan for 110kV Phu Nghia Substation and 110kV line.

C. ADB Safeguard Policy

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

IV. DESCRIPTION OF SUBPROJECT

18. The development of Phu Nghia110kV substation and 110kV transmission line 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.

19. Phu Nghia 110kV substation and 110kV transmission is planned to be built and electrified in Quarter 3, 2016 with three components that are: (1) Phu Nghia 110kV substation in lot KT-01 of Phu Nghia Industrial Zone, Phu Nghia commune, Chuong My district, Hanoi, with a 110/35/22kV-40MVA transformer and a 110/35/22kV-40MVA transformer to be built in 2018 on an area of 6.110m^2. This is part of Phu Nghia Industrial Zone which does not require land acquisition and clearance; (2) Phu Nghia- Xuan Mai 110kV transmission line of 11.828 km long with an acquired area of 256,355 m^2; (3) two 110kV feeder bays at vacant 110 kV distribution yard of 220kV Xuan Mai, in Thach Hoa commune, Quoc Oai District, Ha Noi City (Table 1).

Table 1 The subproject components and location

No	Component	Location	Technical specification/equipment
1	Phu Nghia 110kV Substation	Phu Nghia Commune, Chuong My District, Ha Noi	Power transformer: 110/35/22kV - 40 MVA; 02 automatic transformer 35/0.4kV - 160kVA and 22/0.4kV - 160kVA; 110kV distribution equipment 35kV distribution Equipment; Installation of control systems 6.110m^2 (already acquired and cleared ground)
2	Phu Nghia-Xuan Mai 110kV transmission line	03 Communes Hoa Thach, Can Huu and Dong yen in Quoc Oai District, Ha Noi; 03 Communes Dong Son, Dong Phuong Yen and Phu Nghia, Chuong My District, Ha Noi.	256,355 m^2 (of which 11,807.52 m^2 permanently acquired, 67,409m^2 temporarily acquired for construction and transmission line RoW 177,138m^2) Phu Nghia - Xuan Mai 110kV transmission lines. It has a length of 11.828 km with the technical parameters as follows: AC240/32 wire of 275,7mm^2; TK-50 lightning arrester, OPGW-57 optical cable lightning arrester. 53 double circuits galvanized steel towers.
3	Two 110kV feeder bays in Xuan Mai Substation	Hoa Thach Commune, Quoc Oai District, Ha Noi	3-phase 110kV circuit breaker, SF6, rated voltage of 115kV, 50Hz, rated current 1250A; Within the exisiting Xuan Mai Substation 110 kV disconnect switch110kV potential transformer

20. The detail description of Subproject components are as follows:

A. Phu Nghia 110kV Substation

Equipment Parts

- 01 power transformer: 110/35/22kV - 40 MVA; 02 automatic transformer 35/0.4kV - 160kVA and 22/0.4kV - 160kVA.
- 110kV distribution equipment: switches, disconnectors, neutral connection switch, current transformers, voltage transformers, lightning arresters 110kV, 72kV (at neutral coils of 110kV transformer);
- 35kV distribution equipment: Lighting arrester 35kV, 36,5kV incoming cubicle, 36,5kV sectionalized cubicle, 36,5kV outgoing cubicle, 36,5kV measuring cabinet, 36,5kV automatic cubicle, 36,5kV, cabinet breaker powering capacitor, 35kV 3-phase disconnect switch, fuse 35kV, 35kV capacitor and the 22kV Distribution Equipment: lighting arrester 22kV, 23kV outgoing cubicle, 23kV sectionalized cubicle, 23kV measuringcabinet, 23kV automatic cubicle, cabinet breaker powering capacitor 23kV, 22kV capacitor, Outdoor 24kV 3-phase disconnect switch. Planned in 2018:an additional transformer 110/35/22kV - 40MVA to be installed.
- Installation of control systems - guard station and related equipment.

***Infrastructure Part*:**

- Internal road: 6.0m and 7.5m wide M250 concretized, 15cm thick stone of 4cm thickness, about 200m along.
- Gate and fences: 1,80 m tall, brick.
- Transformer foundation: size 6.0x3.0m
- Control and distribution house: 3 stores, including 01 basement, heat proof corrugated steel roof with total area: 545.52m^2.
- Emergency oil tank: size 7.5x4x1.95m; concretized bottom
- 11,28 m^2 septic toilet;

- Fire fighting water tank: 14.6x4.5x3.5m;
- 20m^2 hazardous waste depot;
- 4.1x5.6m pump station;

21. In summary, after completion of phase 1 of the subproject, the station will operate with one transformer with a capacity of 40 MVA on an area of about 6,110m^2.

Construction method of the substation

22. The construction of the substation will be carried out in a period of 12 months. Main construction activities will include: 1) ground leveling and wall fence building, 2) constructing utility supply facilities, 3) constructing control and distribution house, 4) constructing outdoor support poles and frame, 5) grounding equipment, 6) constructing wastewater facility and roads, 7) installing main electrical equipment, auxiliary equipment and communication, fire prevention system.

23. The construction camp, storage house, stockpiles will be arranged within the site and number of labor in peak time is about 30 people.

24. Power and water supply are provided from the existing sources in Phu Nghia Industrial Zone via a contract. Other construction materials are provided from local supplies which are very available. The location of Phu Nghia substation is illustrated in Figure 1

Figure 1 .Location of Phu Nghia Substation

Construction Work for Phu Nghia Substation

25. The total excavated volume for the Phu Nghia Substation 1,134.5 m3, of which 378.1 m3will be reused for ground leveling works. The remaining volume is transported and stored in a vacant place which is designated by local authority. At this present time, the CPC is in the process of consideration of the most suitable site with easy access. The CPC commit to provide disposal site right before construction starts (Table 2).

Table 2 Earthworks in Phu Nghia 110kV Substation

No	Works	Dimensions (m)	Excavating (m^3)	Filling (m^3)
1	Control House (underground)	32.2x8.7x2.7	756.4	252.1
2	Emergency oil tank	7.5x4x1.95	58.5	19.5
3	Fire control water tank	14.6x4.5x3.5	230	76.7
4	Tower foundation (5)	4.6x3.6x2.2	36.4	12.1
5	Auxiliary works	-	53.2	17.7
Total			1,134.5	378.1

B. Phu Nghia-Xuan Mai 110kV transmission line

The existing environment and land use along transsmission line

26. The 110kV Phu Nghia - Xuan Mai line is 11.828 km in length running through communes of Hoa Thach, Can Huu, Dong Yen of Doi - Quoc Oai District, Dong Son, Dong Phuong Yen, Phu Nghia of Chuong My district. The route runs primarily on agricultural land.

- From the 110kV gantry at 220kV Xuan Mai Substation to the starting pointis 47m long. The route runs over the hill in Hoa Thach commune, Quoc Oai district.
- From starting point to G1: length of 298m. The transmission line traverses on a tea plantation, crossing through a rock pit in Hoa Thach commune, Quoc Oai district. At G1 the steering angle to rightαR = 85^{o}58'58".
- From G1 to G2: length of 236m. The line runs on a tea plantation in Hoa Thach commune, Quoc Oai district. At G2 the left steering angle αL = 21^{o}44'57".

- From G2 to G3: length of 464m. The line runs on agricultural land located in Thach Hoa commune, Quoc Oai district. Crossing twice with the middle voltage and low voltage lines, oncepassingan inter-village road. At G3 the left steering angle αL = 07°53'52".
- From G3 to G4: 3905m long. The route runs on agricultural land situated in Hoa Thach and Can Huu communes of Quoc Oai district and part of agricultural land of Dong Yen commne in Chuong My district. The route passes through Tich River dike, surpassing Tich Giang River and several small tributaries. It crosses middle and low voltage lines 04 times and travers an 8m wide road. At G4 the right angle steering αR = 57°08'34".
- From G4 to G5: 1951m long. The transmission line runs on agricultural land located in Can Huu commune, Quoc Oai district. It continues to cross with the 220kV line, 421B road and inter-village roads twice; 03 times cutting across the middle and low voltage lines. At G5 the left steering angle αL = 36°28'02".
- From G5 to G6: length of 547m. The line runs on agricultural land located in Can Huu commune, Quoc Oai District and Dong Son commune, Chuong My district. It passes Tich River dike and inter-district roads. At G6 the left steering angle αL = 09°24'30".
- From G6 to G7: 1276m long. The route runs through agricultural land located in Dong Son and Dong Phuong Yen communes, Chuong My district. The route runs parallel to the irrigation ditch, traversingan inter-village road. At the G7 right steering angle αR = 08°18'37".
- From G7 to G8: length of 373m. The route runs through agricultural land located in Dong Phuong Yen commune, Chuong My district. The route runs parallel to the irrigation ditch. At G8 the left steering angle αL = 08°06'50".
- From G8 to G9: length of 154m. The route runs through agricultural land located in communes of Dong Phuong Yen and Phu Nghia, Chuong My district. At G9 the left steering angle αL = 12°33'03".
- From G9 to G10: length of 229m. The transmission line runs on the agricultural land located in Phu Nghia Commune, Chuong My district. At G10 the right steering angle αR = 12°19'29".
- From G10 to G11: 1347m long. The line runs on the agricultural land located in Phu Nghia Commune, Chuong My District. It crosses over several lakes, and marshes and a house of grade 4. At G11 the right steering angle αR = 90°00'03".
- From G11 to G12: length of 596m. The line runs on the agricultural land located in Phu Nghia Commune, Chuong My district, crossing an irrigation ditche once. At G12 the left steering angle αL = 88°41'36".
- From G12 to G13: length of 282m. The line continues running on the agricultural land located in Phu Nghia Commune - Chuong My district, crossing a pond. At G13 the right steering angle αR = 37°13'12".
- From G13 to the end point: 93m long. The route runs within Phu Nghia Industrial Zone, traversing internal roads in the IZ and Cuu Khe canal.
- From end point to the 110kV gantry of Phu Nghia substation: 25,67m long

Construction method of the transmission line

27. The transmission line has 53 towers in total; span distance between towers is 220-250m. The construction activities for this 110kV TL include: 1) excavating foundation, 2) foundation concrete work, 3) erecting and securing towers, 4) stretching cables. Successive method for erecting towers is applied in which 8-10 towers are erected at a time. Concrete for the foundation is mixed and poured in situ.

28. As the TL crosses provincial, district and communal roads 5 times, due attention should be made in order to reduce impacts on traffic safety and disruption. When stretching the cable over Tich Giang River, boats will be used.

29. The total excavated soil will be 12,315.8 m^3 about one fifth of the excavated soil (2,677.3m^3) will be reused for filling works (Table 3). The concrete mixing work is carried out on-site with water taken from local water sources located along the transmission line

Table 3. Excavation work for Phu Nghia – Xuan Mai Transmission Line

No	Tower foundation	Quantity	Dimension *(m)*	Excavated soil *(m^3)*	Filled soil (m^3)
1	MB 24x72	22	7.2x7.2x2.5	2,851.2	619.7
2	MB 24x72A	1	7.2x7.2x2.5	12.6	28.2
3	MB 28x80	4	8x8x2.5	640	138
4	MB 48x100	2	10x10x2.5	500	106.2
5	MB 63x110	14	11x11x2.5	4,235	925.8
6	MB 75x130	11	12x12x2.5	3,960	859.4
Total		**53**		**12,315.8**	**2,677.3**

30. The location of the Phu Nghia – Xuan Mai 110 kV transmission line is shown in Figure 2.

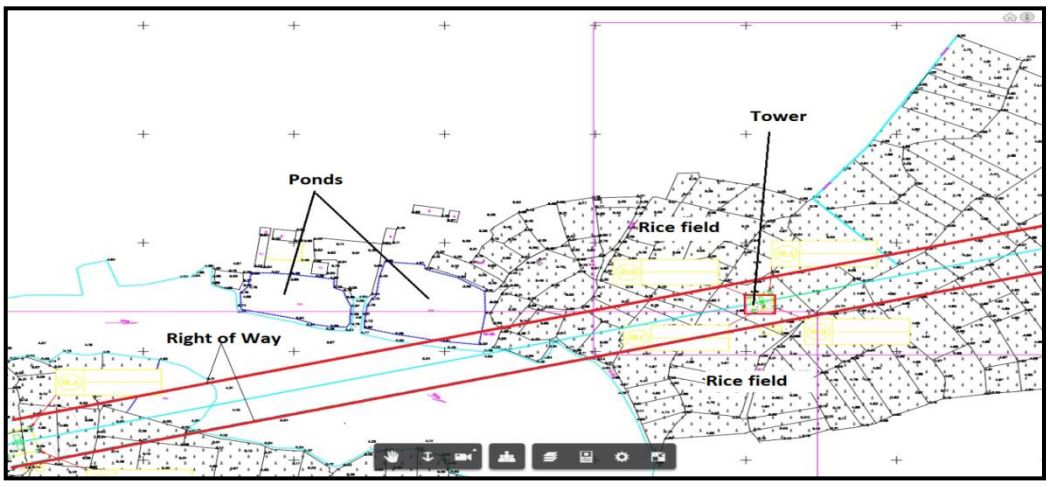

Figure 2. Location of Phu Nghia – Xuan Mai 110kV transmission line

C. Installation of two new feeder bays in Xuan Mai 220kV Substation

31. This component will be installed in the vacant part within Xuan Mai Substation with following equipment (Figure 3):

- 3-phase 110kV circuit breaker, SF6, rated voltage of 115kV, 50Hz, rated current 1250A;
- 110 kV disconnect switch: rated voltage of 115kV; maximum voltage 123kV; frequency of 50Hz; rated current 1250A;,
- 110kV current transformer: 1-phase, soaked in oil, sealed type, outdoor installation; rated voltage of 115kV; maximum voltage of 123kV; frequency of 50Hz
- 110kV potential transformer: 1-phase capacitor type, rated voltage of 115kV, maximum voltage of 123kV.

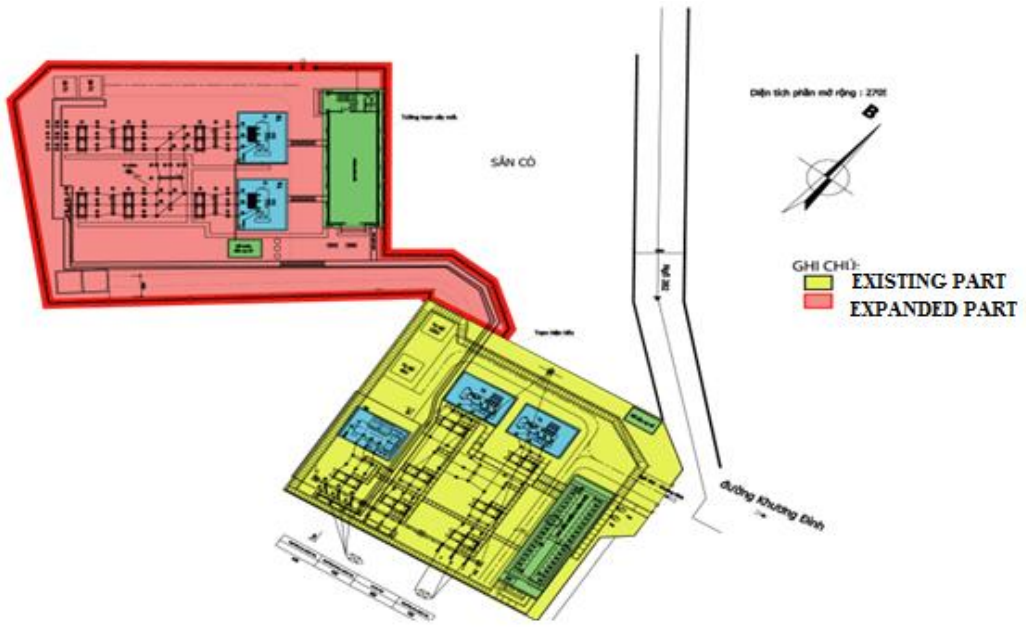

Figure 3.Layout of Feeder bay installation in Xuan Mai Substation

Supply of materials and construction machinery

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

- Steel tower imported and processed domestically;
- 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 3.5-16T trucks to storehouses and then to construction siteby wheelbarrows.

33. The transformers are shipped from providers to the project site by over-gauge vehicles (OGV), under the technical requirements stated by the manufacturer.

34. Modern, specialized and energy saving machinery will be used for the subproject. They are available in Hanoi and surrounding area delivered to the project site by contracted

suppliers to ensure technical qualification and environmental standards. The construction equipment has mainly origin from China and Japan in good conditions as listed in details in Table 4.

Table 4. Machines used for the subproject

No	Machine type	Status	Qty
1	Truck	70%	6
2	Roller tractor	80%	2
3	Winch	70%	2
4	Chain hoist	70%	2
5	Crane	70%	4
6	Cable through machine	80%	4
7	Diesel hammer	70%	4
8	Steel bender	70%	2
9	Water pump	90%	2
10	Air compressor	70%	2
11	Welder	80%	2
12	Electric drill	90%	2

V. DESCRIPTION OF EXISTING ENVIRONMENT

35. The environmental baseline information was obtained primarily from Ha Noi Statistical Yearbooks, state of the environment reports (SoER) prepared by Ha Noi DoNRE, 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

1. Climate

a. Temperature

36. 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 summer, and cold and cloudless winter. From May to October, hot and humid climate is dominant with the average temperature of 28.4oC. From November to April of the following year, cold climate is seen with average temperature of 20.1oC. The values of the average temperature from 2009 to 2013 are shown in Table 5.

Table 5. 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

37*.* The rainy season in the 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 1.639,9 mm. The largest monthly rainfall is 541.4mm in 2009-2013 periods (appearing in Aug 2013). Monthly and yearly rainfall average is shown in the Table 6.

Table 6. Monthly rainfall in Hanoi (mm)

Y / M	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	1427.0
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	1239.2
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	1788.7
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	1809.9
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	1934.8
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	1639.9

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

38. Humidity in this area is subjected 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 is 79%. The average values of the monthly and yearly humidity during the period from 2009 to 2013 are shown in the Table 7.

Table 7. 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*

39. Hanoi is located in the monsoon influenced area. In summer, south-easterly moonsoon 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 Southeastern 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.

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

d. Sunlight hours

41. 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 cloudness 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 in Table 8.

Table 8.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	1390.5
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	1245.3
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	1055.3
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	1032.9
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	1232.1
Avg.	30	38.3	41.8	72	143.6	143.8	150.6	154.3	117.9	107.9	103.5	87.5	1191.2

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

e. Thunderstorms

42. 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 exceeds level 12 (corresponding to 20-year cycle). The storm rainfall can reach from 100 to 500 mm, or 1000 mm at times.

43. 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.

2. Air quality, Noise and Vibration

44. The ambient air quality in the project area and adjacent areas was monitored by Thang Long Environmental Technology Transfer and Consulting Company in collaboration with Institute of Environmental Science and Engineering (IESE). The air samples were taken in August 2014 in bright, breezy condition at 3 locations: in 110kV Phu Nghia Substation, along Phu Nghia-Xuan Mai transmission line and 220kV Xuan Mai Substation (Table 9).

Table 9. Air locations for air, noise and vibration in Phu Nghia Substation and Phu Nghia – Xuan Mai transmission line

No	Code	Sampling time	Location	Coordinates
220kV Xuan Mai Substation				
1	KK1	9h00 August, 2014. Slightly sunny and windy	Gate of 220kV Xuan Mai Substation	E: $105^0$33'958" N: $20^0$56'162"
2	KK2	9h20 August, 2014. Slightly sunny and windy	Control house of220kV Xuan Mai Substation	E: $105^0$33'987" N: $20^0$56'126"
Transmission line area				
1	KK3	9h45 August, 2014. Slightly sunny and windy	Hoa Thach commune, Quoc Oai district	E: $105^0$35'090" N: $20^0$55'489"
2	KK4	10h August, 2014. Slightly sunny and windy	Can Huu commune, Quoc Oai district	E: $105^0$37'060" N: $20^0$57'279"
3	KK5	10h August, 2014. Slightly sunny and windy	Dong Yen commune, Quoc Oai district	E: $105^0$36'012" N: $20^0$55'919"
4	KK6	10h45 August, 2014. Slightly sunny and windy	Dong Yen commune, Chuong My district	E: $105^0$37'359" N: $20^0$55'480"
5	KK7	11h August, 2014. Slightly sunny and windy	Dong Phuong Yen commune, Chuong My district	E: $105^0$38'167" N: $20^0$55'495"
6	KK8	14h August, 2014. Sunny	Phu Nghia commune, Chuong My district	E: $105^0$39'367'' N: $20^0$55'858''
110kV Phu Nghia Substation				
1	KK9	14h August, 2014. Sunny and windy	The Southwest of Phu Nghia substation, adjoiningCuu Khe canal.	E: $105^0$39'800" N: $20^0$56'017"
2	KK10	14h40 August, 2014. Sunny and windy	The Northwest of Phu Nghia substation, adjoining irrigation canal.	E: $105^0$39'797" N: $20^0$56'077"
3	KK11	15h10 August, 2014. Sunny and windy	End point Northeast of Phu Nghia substation	E: $105^0$39'837" N: $20^0$56'076"
4	KK12	15h30 August 4, 2014. Sunny and windy	End point Southeastof Phu Nghia substation	E: $105^0$39'839" N: $20^0$56'017"

45. Subsequent analysis results revealed that all monitored parameters are within permitted limits. The analysis results of air quality for Xuan Mai 220 KV substation at two analyzed times are presented in Table 10

Table 10. Air quality analysis for Xuan Mai 220kV Substation

Parameter	Unit	1st time		2nd time		QCVN 05:2013/BTNMT
		KK1	KK2	KK1	KK2	
Temperature	(^{0}C)	30	30.3	30.2	30.3	-
Humidity	(%)	78	78	77	76	-
Wind velocity	(m/s)	1.1	1.1	1.2	1.4	-
Total suspended particle	($\mu g/m^3$)	129	118	111	102	**300**
CO	($\mu g/m^3$)	1575	1350	1484	1463	**30000**
NO_2	($\mu g/m^3$)	103	101	105	102	**200**
SO_2	($\mu g/m^3$)	159	158	155	157	**350**
VOC	($\mu g/m^3$)	15	17	14	13	-
Noise level	(dBA)	63.7	64.0	60.1	64.5	**70(*)**
Vibration	m/s^2	0.039	0.038	0.034	0.036	**0.055(**)**
Electric field intensity	(kV/m)	1.8	2.7	1.9	2.7	-

Note:

QCVN 05:2013/BTNMT: National technical regulations on ambient air quality

(*) QCVN 26:2010/BTNMT: National technical regulations on noise.

(**) QCVN 27: 2010/BTNMT - National Technical Regulation on vibration;

46. The air quality at transmission line in two analyzed times are presented in Table 11 and Table 12 respectively.

Table 11. Air quality analysis along the transmission line at first time

Parameter	Unit	1st time						QCVN 05:2013/ BTNMT
		KK1	KK2	KK3	KK4	KK5	KK6	
Temperature	(^{0}C)	30.4	30.2	30.4	30.1	30.0	30.7	-
Humidity	(%)	75	76	76	77	75	76	-
Wind velocity	(m/s)	1.2	1.1	1.2	1.0	1.1	1.1	-
Total suspended particle	($\mu g/m^3$)	110	114	129	103	121	116	**300**
CO	($\mu g/m^3$)	1515	1392	1590	1509	1650	1527	**30000**
NO_2	($\mu g/m^3$)	103	98	101	108	102	105	**200**
SO_2	($\mu g/m^3$)	158	150	156	158	165	157	**350**
VOC	($\mu g/m^3$)	15	11	14	17	15	14	**-**
Noise level	(dBA)	58.7	53.0	49.7	57.5	57.1	59.3	**70(*)**
Vibration	m/s^2	0.023	0.020	0.024	0.022	0.029	0.027	**0.055(**)**
Electric field intensity	(kV/m)	Und.	Und.	Und.	Und.	Und.	Und.	-

(Source: Institute of Environmental Science and Engineering (IESE), 2014)

Note: QCVN 05:2013/BTNMT: National technical regulations on ambient air quality

(*) QCVN 26:2010/BTNMT: National technical regulations on noise.

(**) QCVN 27: 2010/BTNMT - National Technical Regulation on vibration;

Table 12. Air quality analysis along the transmission line at second time

Parameter	Unit	2nd time						QCVN 05:2013/ BTNMT
		KK1	KK2	KK3	KK4	KK5	KK6	
Temperature	(^{0}C)	30.2	30.1	30.2	30.3	30.5	31	-
Humidity	(%)	75	75	76	75	74	76	-
Wind velocity	(m/s)	1.3	1.5	1.8	1.3	1.9	1.2	-
Total suspended particle	($\mu g/m^3$)	115	119	126	115	117	118	**300**
CO	($\mu g/m^3$)	1520	1746	1933	1505	1521	1538	**30000**
NO_2	($\mu g/m^3$)	101	112	105	109	102	117	**200**
SO_2	($\mu g/m^3$)	157	163	170	160	161	159	**350**
VOC	($\mu g/m^3$)	15	14	19	15	16	14	**-**
Noise level	(dBA)	45.9	46.4	46.9	47.7	47.4	50.0	**70(*)**
Vibration	m/s^2	0.022	0.021	0.018	0.025	0.028	0.029	**0.055(**)**
Electric field intensity	(kV/m)	Und.	Und.	Und.	Und.	Und.	Und.	-

(Source: Institute of Environmental Science and Engineering (IESE), 2014)

Note: QCVN 05:2013/BTNMT: National technical regulations on ambient air quality

(*) QCVN 26:2010/BTNMT: National technical regulations on noise.

(**) QCVN 27: 2010/BTNMT - National Technical Regulation on vibration;

47. The air quality at Phu Nghia substation in two analyzed times are presented in Table 13 and Table 14 respectively

Table 13. Air quality analysis for 110kV Phu Nghia Substation at first time

No	Parameter	Unit	1st time				QCVN 05:2013/BTNMT
			KK9	KK10	KK11	KK12	
1	Temperature	^{o}C	30,3	30,5	30,3	30,1	-
2	Humidity	%	74	74	73	75	-
3	Wind velocity	m/s	1,3	1,1	1,7	1,5	-
4	CO	$\mu g/m^3$	1673	1680	1640	1650	**30.000**
5	SO_2	$\mu g/m^3$	159	160	165	168	**350**
6	NO_2	$\mu g/m^3$	122	120	123	129	**200**
7	VOC	$\mu g/m^3$	19	18	16	13	**-**
8	Total suspended particle	$\mu g/m^3$	134	139	147	135	**300**
9	Noise level	dBA	69,0	68,8	69,7	68,0	**70 (*)**
10	Vibration	m/s^2	0,032	0,027	0,030	0,036	**0,055(**)**
11	Electric field intensity	kV/m	Und.	Und.	Und.	Und.	-

(*Source: Institute of Environmental Science and Engineering (IESE)*)

Note: QCVN 05:2013/BTNMT: National technical regulations on ambient air quality

(*) QCVN 26:2010/BTNMT: National technical regulations on noise.

(**) QCVN 27: 2010/BTNMT - National Technical Regulation on vibration;

Table 14. Air quality analysis for 110kV Phu Nghia Substation at second time

no	Parameter	Unit	2nd time				QCVN 05:2013/ BTNMT
			KK9	KK10	KK11	KK12	
1	Temperature	^oC	30,0	30,2	30,5	30,5	-
2	Humidity	%	74	73	74	77	-
3	Wind velocity	m/s	1,4	1,8	1,2	1,9	-
4	CO	$\mu g/m^3$	1690	1600	1660	1678	30.000
5	SO_2	$\mu g/m^3$	160	147	169	164	350
6	NO_2	$\mu g/m^3$	128	121	126	123	200
7	VOC	$\mu g/m^3$	17	16	17	16	-
8	Total suspended particle	$\mu g/m^3$	130	136	135	138	300
9	Noise level	dBA	59,4	58,3	58,6	59,2	70 (*)
10	Vibration	m/s^2	0,036	0,033	0,038	0,037	0,055(**)
11	Electric field intensity	kV/m	Und.	Und.	Und.	Und.	-

(Source: Institute of Environmental Science and Engineering (IESE), 2014)

Note: QCVN 05:2013/BTNMT: National technical regulations on ambient air quality

(*) QCVN 26:2010/BTNMT: National technical regulations on noise.

(**) QCVN 27: 2010/BTNMT - National Technical Regulation on vibration;

48. At all monitored areas (110kV Phu Nghia Substation, along 110kV Phu Nghia-Xuan Mai transmission line and 220kV Xuan Mai Substation), there are no signs of contamination; all analytical parameters are within the limits allowed by QCVN 05: 2013/BTNMT, QCVN 26:2010/BTNMT, QCVN 27:2010/BTNMT. Several parameters such as CO, SO_2, and NO_2 are relatively high as a result of the substation's proximity to surrounding plants in Phu Nghia Industrial Park.

3. Topography, Geography and Soil

a. Topography

49. Phu Nghia 110kV substation is located on a flat terrain with an elevation of around +0.3 – 0.4m compared to surrounding ground. It is located within Phu Nghia Industrial Zone, Phu Nghia commune, Chuong My district, Hanoi which is convenient for construction work and connected to the new 110 kV transmission line.

50. The 110kV Phu Nghia - Xuan Mai transmission line mainly traverses agricultural land for paddy rice. In some sections in Can Huu commune, Quoc Oai district low-lying lands exist and are often flooded during rainy season. Some other sections run on slightly sloped terrain.

51. Two new feeder bays are to be installed within Xuan Mai 220kV substation located in Long Phu village, Hoa Thach commune, and Quoc Oai district. Hoa Thach Commune has relatively complex terrain, with different heights. There are many hills, lakes; most rice cultivation is in lowland areas.

b. Geography

52. According to the geological survey in the project area, the geological composition of the soil layers includes thin filling material, reddish brown clay and blackish yellowish grey sand. Soil layers are described as follows:

In 110kV Phu Nghia Substation

- *Layer KQ*: Yellowish-brownish grey, reddish brown sandy clay with organic substances. This layer distributes in the surface of the terrain in all boreholes with depths ranging from 0.4m (K12) to 0.6m (K11).
- *Layer 1*: Plastic to stiff yellowish grey, reddish brown, bluish grey sandy clay. The depths of top layer and bottom layer are 0.4-0.6m and 3.9-4.0m respectively. The thickness of this layer varies from 3.3m (K11) to 3.6m (K12).
- *Layer 2:* Medium dense brownish-yellowish grey silty sand. The depth of top layer varies from 3.9m (K11) to 4.0m (K12).

In transmission line area.The stratography of the surveyed area from the topsoil to the depth of 0.7m includes 5 layers as described below:

- *Layer D*: filling material layer including debris, broken bricks, filled soil for rice field etc.
- *Layer 1:* Stiff brown clay;
- *Layer 2:* Soft plastic brownish-bluish grey sandy clay;
- *Layer 3*: Stiff yellowish brown, reddish brown clay with silt
- *Layer 4*: Soft to very soft plastic white bluish grey clay

In 220kV Xuan Mai substation. Stratigraphic layers include:

- Layer KQ: yellowish gray, brownish gray, reddish brown clay with many organic contaminants; at depths from 0.4m - 1m.
- Layer 1: Stiff to very stiff, bluish grey- yellowish grey, reddish brown sandy clay, clay. Depths vary from 1.7m (K9) to 6.5 m (K1).
- Layer 2: Soft plastic,bluish-blackish gray. Depths vary from 1.2m (K8) to 2.5m (K9).
- Layer 3:Medium dense, brownish yellowish grey mixed sand. Depths vary from 3.8m (K6) to 7,6m (K15).
- Layer 4:Very soft to plastic, brownish-blackish grey clayed sand. Depth of top layer: 5,8m.

c. Soil quality

53. To assess the soil quality in the subproject area, two soil samples at industrial area and one soil sample at agricultural area are taken (Table 15)

Table 15. Locations for soil sampling

No	Code	Sampling time	Location	Coordinates
Soil at industrial area				
1	D1	15h10 August 4, 2014. Sunny and windy	110kV Phu Nghia Substation	E: $105^0$39'830" N: $20^0$56'047"
2	D2	9h30 August 4, 2014 Slighly sunny and windy	Emergency oil tank 220kV Xuan Mai Substation	E: $105^0$33'996" N: $20^0$56'110"
Soil at agricultural area				
3	D3	10h45 August 4, 2014. Sunny and windy	Rice field in Can Huu commune, Quoc Oai district	E: $105^0$36'566" N: $20^0$56'726"

54. The analyzed results of soil quality in the subproject site are presented in Table 16. It is found that the soil at 220kV Xuan Mai substation location has high concentration of heavy metals. However, in agricultural and industrial soils, values of analyzed parameters are within permitted limits set by QCVN 03: 2008/BTNMT for heavy metal in the soil

Table 16. Analysis of soil quality in the subproject site

No	Parameter	Unit	Result			QCVN 03:2008/BTNMT	
			D1	D2	D3	industrial soil	farming soil
1	Zn	mg/kg dry soil	14	21	26	**300**	**200**
2	Pb	mg/kg dry soil	10.5	8.21	5.33	**300**	**70**
3	As	mg/kg dry soil	3.8	2.5	2.7	**12**	**12**
4	Fe	mg/kg dry soil	11.3	17.2	14	-	-
5	Oil and grease	mg/kg dry soil	0.2	0.8	0.001	-	-

(*Source: Institute of Environmental Science and Engineering (IESE), 2014*)

Note**:**

- *QCVN03: 2008/BTNMT- National Technical standards on permissible limits of heavy metals in soil.*

4. Surface water/groundwater resources

a. Surface water

55. The subproject traverses mainly through rice fields and hilly land in Chuong My district and Quoc Oai district in Hanoi. The drainage system in the subproject area consists of sewer to the in-field irrigation canals, small water bodies such as Tien Sa lake, Cuu Khe Canal, Tich Giang River, during the year, the water level at the RoW is subject to seasonal changes. In dry season, the RoW area is almost dried up.

56. During the rainy season the area of transmission line going through is often submerged. According to a household survey, the routes flooded by 0.2 - 0.3 m, for 1 to 2 days. Rainy season lasts from June to October. The total volume of water accounted for 80-85% of annual flow. The minimum daily flow is 2,5-20,0l/s/km^2. Regarding water quality of the area, the mineralization reaches from 50-100mg/l; turbidity is from 50-100g/m^3. The difference in water levels is 745mm as highest tide affected by diurnal tide.

57. To assess the water state in the subproject area, the quality of surface water and groundwater has been monitored made in the area of transmission line and the construction area of 110kv Phu Nghia substation. The sampling locations for surface and groundwater in the subproject area are presented in Table 17.

Table 17. Sampling locations for surface and groundwater in the subproject area

No	Code	Sampling time	Location	Coordinates
	Transmission line area			
1	NM1	9h50 August 4, 2014. Slightly sunny and windy	Tich River, Hoa Thach commune, Quoc Oai district	E: $105^0$35'728" N: $20^0$57'108"
2	NM2	10h10 August 4, 2014. Sunny and slightly windy	Rice field at Can Huu Commune, Quoc Oai district	E: $105^0$36'566" N: $20^0$56'726"
	110kV Phu Nghia Substation			
3	NM3	14h50 August 4, 2014. Sunny and windy	Cuu Khe canal, adjoining the west of Phu Nghia substation	E: $105^0$39'792" N: $20^0$56'023"
4	NM4	15h20 August 4, 2014. Sunny and windy	Irrigation canal, adjoining the north of Phu Nghia substation	E: $105^0$39'842" N: $20^0$56'062"

58. The following Tables18 and 19showthat a majority of parameters in surface water quality in the area of Phu Nghia substation and Phu Nghia-Xuan Mai transmission lines are within allowable standard QCVN 08:2008/BTNMT (column B1). Parameters exceeding permissible limits are COD (chemical oxygen demand), BOD_5 and Coliform as shown below:

59. Transmission Line Area: BOD_5 exceeded from 1.32 to 1.43 times; COD exceeds from 1.27 to 1.35 mg/l; T. Coliform exceeds 1.02 times. It is probable that Tich River is receiving waste water from residential areas, industrial parks and factories locating along the transmission line. Other causes are aquaculture activities, improper handling of domestic waste. In the area of rice fields, it may result from the intensive cultivation and fertilization. Consequently, the organic content in the surface water in the transmission line area is higher than prescribed in regulations.

60. The construction site of 110 kV Phu Nghia substation: BOD_5 exceeds from 1.11 to 1.22 times; COD exceeds from 1.21 to 1.27 times; Total Coliform exceeds from 1.04 to 1.06 times. It is most likely that the ditch is collecting waste water from the surrounding residential area while mostly wastewater is untreated or preliminary treated.

Table 18. Surface water quality at the transmission line site

No	Parameter	Unit	Result		QCVN 08:2008/BTNMT (Column B1)
			NM1	NM2	
1	pH	-	6,6	6,2	**5,5-9**
2	EC	µΩ/cm	86	88	**100**
3	Turbidity	NTU	45	51	**-**
4	Color level	TCU	27	32	**-**
5	Temporary hardness	mg/l	197	189	**-**
6	TSS	mg/l	55,8	51,2	**100**
7	TDS	mg/l	399	353	**-**
8	DO	mg/l	3,7	3,6	**≥ 4**
9	COD	mg/l	40,5	38,1	**30**
10	BOD_5	mg/l	21,4	19,8	**15**
11	NH_4^+	mg/l	0,43	0,36	**0,5**
12	NO_3^-	mg/l	1,9	1,1	**10**
13	SO_4^{2-}	mg/l	1,50	1,40	**-**
14	N	mg/l	6,4	5,4	**-**
15	Total P	mg/l	1,4	2,1	**-**
16	Fe	mg/l	0,39	0,28	**2**
17	Zn	mg/l	0,42	0,37	**1,5**
18	Pb	mg/l	KPHT	KPHT	**0,05**
19	As	mg/l	0,0002	0,0001	**0,05**
20	Oil and grease	mg/l	0,095	0,092	**0,1**
21	T.Coliform	MPN/100ml	7.650	7.680	**7.500**

(Source: Institute of Environmental Science and Engineering (IESE), 2014)

Table 19. Surface water quality in 110kV Phu Nghia Substation

No	Parameter	Unit	Result		QCVN 08:2008/BTNMT (Column B1)
			NM3	NM4	
1	pH	-	6,4	6,5	**5,5-9**
2	EC	µΩ/cm	84	87	**100**
3	Turbidity	NTU	46	50	**-**
4	Color level	TCU	26	31	**-**

No	Parameter	Unit	Result		QCVN 08:2008/BTNMT (Column B1)
			NM3	NM4	
5	Temporary hardness	mg/l	192	195	**-**
6	TSS	mg/l	51,9	56,3	**100**
7	TDS	mg/l	364	380	**-**
8	DO	mg/l	3,8	3,9	**≥ 4**
9	COD	mg/l	36,4	38,1	**30**
10	BOD_5	mg/l	16,7	18,3	**15**
11	NH_4^+	mg/l	0,27	0,30	**0,5**
12	NO_3^-	mg/l	1,4	1,6	**10**
13	SO_4^{2-}	mg/l	1,43	1,45	**-**
14	N	mg/l	5,85	6,12	**-**
15	Total P	mg/l	1,19	1,28	**-**
16	Fe	mg/l	0,31	0,37	**2**
17	Zn	mg/l	0,38	0,39	**1,5**
18	Pb	mg/l	KPHT	KPHT	**0,05**
19	As	mg/l	0,0001	0,0002	**0,05**
20	Oil and grease	mg/l	0,012	0,013	**0,1**
21	T.Coliform	MPN/100ml	7.800	7.960	**7.500**

(Source: Institute of Environmental Science and Engineering (IESE), 2014).

Notes:

- *(-): unregulated or undetected.*
- *QCVN08:2008/BTNMT: National Technical Regulation on Surface Water Quality*
- *Column B1: For water used for irrigation purposes or other uses that require the same water quality or intended uses as described in B2*.

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 m^3 per day. The Center for water resource monitoring and forecast (MONROE) 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 m^3 per day. Based on geological and hydrological surveys in the project area, groundwater levels are relatively stable in the boreholes, changing from 4,4m to 4.5m. Surface water and groundwater are subject to seasonal fluctuations

62. In regards of groundwater quality, results from analyzing water taken from wells (Table 20) treated through sand filter tank showed that a majority of parameters are within allowed standards by QCVN09:2008/BTNMT-National Technical Regulation on groundwater quality; only iron content exceeds1.14-1.36 times, Mn2+ exceeding 1.06-1.22 times compared with the permitted standards. However, groundwater in wells will be used to supply to the fire control water tank, rather than domestic use. Thus, it would not have bad health impacts on substation operators. Groundwater quality in the subproject area is relatively good as shown in Table 21.

Table 20. Sampling locations for groundwater in Phu Nghia Substation and Phu Nghia – Xuan Mai transmission line

No	Code	Sampling time	Location	Coordinates
1	NN1	10h20 August 2014 Sunny, breezy	Drilled well at Mr Van Chung house, Can Thuong hamlet, Can Huu Commune, Quoc Oai District	E: $105^0$37’049” N: $20^0$57’289”
2	NN2	10h10 August 2014. Sunny, breezy	Drilled well at Mr Vu Manh Thang house, Dong Ha hamlet, Dong Yen Commune, Quoc Oai district	E: $105^0$36'012” N: $20^0$55'919”
3	NN3	10h40 August 2014. Sunny, breezy	Drilled well at Mr Toan Son house, Khuyet Thuong hamlet, Dong Son Commune, Chuong My District	E: $105^0$37’362” N: $20^0$55’498”
4	NN4	11h10 August 2014. Sunny, windy	Drilled well at Ms Yen, Dong Cuu hamlet, Dong Phuong Yen commune, Chuong My District	E: $105^0$38’122” N: $20^0$55’494”
5	NN5	15h400 August 2014. Slightly sunny, windy	Drilled well at the duck farm near Phu Nghia Industrial Park	E: $105^0$39’729” N: $20^0$56’082”

Table 21. Analyzed results of groundwater quality in Phu Nghia Substation transmission line site

No	Parameter	Unit	Result					QCVN 09:2008/BTNMT
			NN1	NN2	NN3	NN4	NN5	
1	pH	-	6,2	6,4	6,3	6,4	6,1	**5,5 – 8,5**
2	Hardness	mg/l	221	253	221	287	256	**500**
3	TSS	mg/l	637	639	637	535	536	**1500**
4	NO_3^-	mg/l	4,9	4,5	4,8	5,0	4,6	**15**
5	SO_4^{2-}	mg/l	149	161	156	160	153	**400**
6	Cl^-	mg/l	120	145	128	119	137	**250**
7	Total Fe	mg/l	5,7	5,9	6,3	6,8	6,5	**5**
8	Ca^{2+}	mg/l	45,8	43,7	51,1	48,9	46,6	**-**
9	Al^{3-}	mg/l	34,5	34,9	40,2	41	38,4	**-**
10	Mn^{2+}	mg/l	0,56	0,53	0,58	0,61	0,57	**0,5**
11	As	mg/l	0,03	0,04	0,03	0,03	0,04	**0,05**
12	Zn	mg/l	1,5	1,7	1,9	1,5	1,6	**3,0**
13	Cr	mg/l	Undt.	Undt.	Undt.	Undt.	Undt.	**0,05**
14	Total Coliform	MPN/100ml	2	1	KPHT	2	1	**3**
15	Oil and grease	mg/l	Undt.	Undt.	Undt.	Undt.	Undt.	**-**
16	E.Coli	MPN/100ml	Undt.	Undt.	Undt.	Undt.	Undt.	Undt.

Note:

- *NN1: Groundwater sampling at the substation*
- *QCVN 09:2008/BTNMT: National technical regulation on groundwater quality.*
- *(-): unregulated, undetected.*

B. Biological Environment

1. Vegetation and Land Use

63. 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 hectare 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.

64. Terrestrial ecosystem includes terrestrial flora consisting of mainly artificial vegetation: rice, tea plant, vegetables, fruits, shrub gardens. Fauna: there are no endangered animals, mostly livestock animals such as cattle, pigs, chickens, dogs, cats, etc.; natural fauna include some reptiles, rodents, birds, bats, rats, hamsters, frogs etc.

65. Aquatic ecosystem in rivers and lakes in the project 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, shrimp, crabs, snails etc. Zooplankton includes thyroid groups, zoo benthic crabs, snails, clams group as mussels... bivalve mollusks, gastropods, mollusks, 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.

66. Land use: total natural land area of 6 communes in the subproject is 6126 ha; which is mainly agricultural land. Total land area acquired by the subproject is 256,355.3 m^2, including temporarily and permanently acquired land. The permanently acquired land is used for the construction of 110 kV Phu Nghia substation and 52 tower foundations, which are primarily agricultural land, partly fruit. The area occupied temporarily and for RoW is agricultural land as well.

2. Wildlife

67. No significant wildlife occurs any longer within the area. There are no animals that could interfere with or have impact on the subproject site.

3. Conservation areas

68. There are no conservation areas within the proximity of the subproject site.

C. Socio-economic conditions

1. Population

69. The subproject site situates in 6 communes of 2 districts of Quoc Oai and Chuong My, Hanoi, with a total area of 6096 hectares and a population of 62567 people. The average density is 10.24 people/ha. Details of affected communes are described in Table 22.

Table 22. Demographic characteristics of affected communes

No	Communes	Population	M	F	Ethnic Minority
1	Hoa Thach	11,295	5,549	5,746	None
2	Can Huu	11,092	-	-	-
3	Dong Yen	12,212	-	-	None
4	Dong Son	9,276	-	-	None
5	Dong Phuong Yen	10,140	-	-	-

2. Local Economy

70. In Hanoi, GDP growth on average in the 2006-2010 period reached 10.73%/year, of which services 52.5%, industry - construction 41.6%, agriculture 5.9%. The economic structure shifted towards increased proportion of the service sector, industry - construction, reduced proportion of the agricultural sector. GDP per capita by the end of 2010 isVND37 million.

71. The average economic growth rate in period 2011-2015 reached 12-13%/year; from 2016 to 2020 to reach about 11-12% and from 2021 to 2030 about 9.5 to 10%. By 2015, per capita GDP of Hanoi is 4100-4300 USD; by 2020 is about 7100-7500 USD, by 2030 to reach 16,000 - 17,000 USD (in actual price).

72. By 2015, 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 Ha Noi averaged 14-15%/year over the period 2011 to 2015 and 13-14% in the period 2016-2020.

73. Chuong My and Quoc Oai economy are shifting from agriculture to industry and services with higher number of industrial facilities and parks. In Chuong My, there are over 356 industrial enterprises and more than 12,000 household handicraft and manufacturing establishments.The 2013 economic growth rate in Chuong My and Quoc Oai is 11.5% and 11.45 respectively.

3. Social Infrastructure

a. Public Health and Sanitation

74. The subproject site is located in a distance of 15km 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.

75. In the subproject area, each commune has one clinic and each district has one general hospital for primary health care for people.

76. Hanoi is one of two provinces where the number of people infected with HIV is highest, after Ho Chi Minh City. Information from the Center for HIV/AIDS, Hanoi Department of Health showed that, according statistics to mid-2013, around Hanoi there are about 24,000 people who are infected by HIV (of which 3,800 people died of AIDS). All 29 districts in the city have reported detection of the infection; 536 of the total 577 communes, wards and townships (92.8%) have reported data from HIV infection. The number of people infected with HIV is mainly concentrated in urban districts. By contrast, in the outlying districts Ha Noi such as Chuong My and Quoc Oai, the number of infected people is low.

77. 100% of households in 6 subproject communes have access to electricity, tap water. Drilled well water is still a fairly common supply for production and animal husbandry. Solid waste is collected by collecting teams by commune.

b. Education

78. Ha Noi has hundreds of leading institutes, more than 50 universities and colleges that are training important laborers and supplying some 80,000 graduates to the laborer market.

79. Quoc Oai and Chuong My districts has relatively a well-developed educational infrastructure. In addition, to public schools at all levels from pre-school to high school, this area possesses colleges and universities such as University of Forestry, College of Ha Tay pedagogy, school of sapper officers, community colleges etc. and private educational institutions. The project communes have all4 school levels: kindergarten, elementary school, secondary school, junior high school and high school.

c. Communications

80. Ha Noi is the biggest communications center 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.

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

d. Water supply, electricity and transport

82. ***Water supply***. Currently 96-97% of Ha Noi urban dwellers are supplied with 120 liters/ person/day. 100% households in the subproject area are supplied with Da River water supply system.

83. ***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 rivers in the subproject area including Tich River, Bui River, Nhue River, Day River... are listed as highly polluted water bodies in Vietnam

84. ***Power supply***. Ha Noi 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 neighboring areas is designed.

85. Transport. Hanoi has a well-developed transport system. In Quoc Oai and Chuong My districts the transportation system is quite favorable as part of the planned urban chain of Mieu Mon - Xuan Mai - Hoa Lac - Son Tay. The subproject is 20 kilometers southwest of the center of Hanoi, via Ha Dong City; crossed by Highway 6A, Highway 32, Highway 21A, 21B, Route 80 and inland waterways such as Bui River, Day River, Nhue River, etc... At the communes, inter-village roads are concretized for a high proportion.

86. Cultural and Heritage Sites. The subproject belongs to the former Ha Tay province, which is a region rich in cultural history and scenery. Chuong My and Quoc Oai lie in the center of the tourist triangle Hanoi - Ba Vi - Perfume Pagoda. Some famous sites include Perfume Pagoda, Thay Pagoda, Dau Pagoda, Tay Phuong Pagoda, Tram Gian Pagoda, Ba Vi National Park, scenic spots such as Suoi Tien, Suoi Mo, Ao Vua – Khoang Xanh, Suoi Hai, Dong Mo,etc

87. In 6 communes, there are several public places of local communities as communal houses, pagodas, and offices, schools that are considered sensitive receptors. However, given the fact that the substation is to be built within the premise of the industrial park and the transmission line traverses mostly agricultural land. It is confirmed that the project implementation will not have any impact on these sites. A list of nearby sites is presented in Table 23.

Table 23. Sensitive receptors surveyed around the subproject site

No	Sites	Distance to the project
1	Phu My Group – in Phu Nghia IP	300m
2	Phu Nghia Police Station in Phu Nghia IP	300m
3	Tien Sa Lake – Phu Nghia IP	500m
4	Phu Nghia IP wastewater plant	500m
5	Phu Nghia IP Worker Compound	1km
6	Phu Nghia Communal People's Committee	3km
7	Phu Nghia primary school	2.5km

(*Source: IEE consultant survey, 2015*).

4. UXO Clearance

88. After many decades of war, bombs, mines and explosives are still an important issue in Vietnam. Area of bombs, mines and explosives clearance is estimated 2.4 ha. The UXO clearance will be implemented for Phu Nghia 110 kV substation and 110 kV transmission line according to the decision No 1095/QD-BTL dated 16 June 2015. Area of UXO disarmament is about 2.4 ha (see Appendix D)

5. Subproject affected people

89. The subproject is to be implemented over a relatively wide area. The total area of 256.355 m^2 is for acquisition, including the temporarily acquired land and ROW. Phu Nghia 110kV substation will be built within Phu Nghia Industrial Zone and the installation of additional feeder bays is conducted at Xuan Mai Substation. Therefore, the most visible impacts are mainly caused by Phu Nghia – Xuan Mai 110kV transmission line of 11,809km long running through 6 communes in Quoc Oai an Chuong My district. The total number of households affected by the project is 64. Total acquired land area is 256.355 m^2 of which 67.409m^2 will be taken temporarily. Details of specific land categories are shown in the Table 24.

Table 24. Summary on land acquisition by the subproject

Commune	Total acquired area (m^2)	Farming land permanently acquired (m^2)	IP land (for 110kV transmission)	Perennial crop area permanently acquired (m^2)	Other annual crops (m^2)	Aqua farming area permanentlly acquired (m^2)	Cleared vegetation (m^2)	Temp. land (m^2)	ROW
Quoc Oai District									
Hoa Thach	73,870	1,110		432	121		500	19,362	52,845
Can Huu	73,389	1,775						20,314	51,300
Dong Yen	1,724						-	363	1,361
Chuong My Dist.									
Dong Son	23,64	515					55	6,378	16,742
Dong Phuong Yen	21,91	557					100	6,022	15,329
Phu Nghia	55,72	1,120	6,110			67	115	14,97	39,562
Total	256,3	*5,077*	*6,110*	*432*	*121*	*67*	*770*	*67,41*	*177,14*

90. A total of 64 households having land and property are affected by the subproject; the list of AHs is provided in Table 25. A compensation plan will be made separately for this subproject.

Table 25. Number and location of AHs

No.	Number of AHs	Location
1	1	Bach Thach Hamlet, Hoa Thach Commune
2	1	Cau Giay, Hanoi
3	20	Bach Thach Hamlet, Hoa Thach Commune
4	4	Dinh Tu Hamlet, Can Huu Commune
5	6	Can Thuong Hamlet, Can Huu Commune
6	6	Can Ha Hamlet, Can Huu Commune
7	2	An Son Hamlet, Dong Son Commune
8	3	Luong Son Hamlet, Dong Son Commune
9	2	Dong Cuu Hamlet, Dong Phuong Yen Commune
10	4	Yen Kien Hamlet, Dong Phuong Yen Commune
11	4	Phu Vinh Hamlet, Phu Nghia Commune
12	1	Phu Huu 1 Hamlet, Phu Nghia Commune
13	2	Khe Than Hamlet, Phu Nghia Commune
14	2	Quan Cham Hamlet, Phu Nghia Commune
15	2	Nghia Hao Hamlet, Phu Nghia Commune
16	3	Dong Tru Hamlet, Phu Nghia Commune
Total	**64**	

a. Additional features of Phu Nghia 110 kV Substation and Transmission line

91. Phu Nghia 110kV substations are located in Lot MT-01, of Phu Nghia Industrial Zone and compensation and land clearance are not required. Phu Nghia – Xuan Mai TL runs on agricultural land for rice and tea crops and far from residential areas (Figure 4).

Substation site, 0.3km from Highway 6

The cleared substation area

Access road – front view of the substation

Left side of the substation adjoining the irrigation canal

The 110kV transmission line crosses over Phu Nghia commune rice field

Rice fields along 11.8km of 100kV Phu Nghia – Xuan Mai in all 6 communes

Figure 4.Views of Phu Nghia 110 substation site and transmission line

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIONS

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. In this way potentially impacts of common activities of the three phases can be addressed together thereby minimizing redundant assessments. Potential impacts specific the subproject component are discussed separately. This structure carried forward and also used to structure the EMP for the subproject.

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 and erection of 52 towers for the 11.809 km long Phu Nghia - Xuan Mai transmission line. Total 64 households are affected; Total 256,228.9 m^2 of land affected by the subproject, from that 5,697.5 m^2 are permanently acquired, while 177,138.3 m^2 are subjected to ROW and 67,409.45 m^2 will be affected during the construction process. Land types acquired for the project include agricultural land, perennial crop land and aquaculture land. Detailed areas of each type and other properties are shown in Table 26.

Table 26. Affected land area and properties in the Subproject by commune

No	Commune	Permanently acquired land (m^2)	Perennial trees (acacia, tea, Eucalyptus) (m^2)	Temporarily acquired land for construction (m^2)	Land type
1	Hoa Thach	553.00	500	1,696.25	Perennial crop land
		1,110.44		17,665.30	Rice farming land
2	Can Huu	175.20		20,313.65	Rice farming land
3	Dong Yen			362.88	Rice farming land
4	Dong Son	514.72	55	6,377.94	Rice farming land
5	Dong Phuong Yen	556.96	100	6,022.23	Rice farming land
6	Phu Nghia	1,119.96	115	14,865.05	Rice farming land
		67.24		391.94	Aquaculture
Rice farming land		5,077.28	270	65,321.26	
Aquaculture		67.24	0	391.94	
Perennial crop land		553.00	500	1,696.25	
Total		**5,697.52**	**770**	**67,409.45**	

(*Source: Project's FS report, 2014)*

The main impacts of this phase are incurred from vegetation cover clearance where needed along TL and at SS site and ground clearance. The potential impacts include dust, noise, emissions, biomass from the vegetation clearance activities and domestic and construction waste. Other indirect impacts include increased traffic vehicles, the residence of workers; labor safety incidents and community safety.

95. Mitigation measures

Details of mitigation measures in pre-construction stage are elaborated in the RP for this subproject and specifically expressed in the EMP, which may include;

- Affected persons are informed ahead on the subproject implementation and participated in acquisition and inventory of land, consulted in compensation assistance
- Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Hanoi City People's Committee.
- Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations.
- Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations. Estimated cost of compensation and assistance for AHs whose trees/crops will be cut by the subproject is proposed approximate VND 22,506,788,983.
- Budget for compensation payment will be enough and available.
- Conduct design of tower height to minimize impacts due to crops and trees clearance.
- 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.

- Trees and vegetation should be protected; tree clearance should be done within designated area.

b. UXO Clearance

96. Impacts: In the project area, it may still exist UXO. Thus if not implement UXO clearance, it may cause risks of worker's and people's life when conducting the project construction. The UXO clearance procedure: before preparing and clearing site for constructing the project, it is necessary to coordinate with the competent agency for UXO clearance in the proposed project area..

97. Mitigation measure: * The proposed guidance for UXO clearance is as follows:

- Execution of demining and UXO is done following these steps:

  + Covering UXO detection and clearance area,

  + Clearing the grounds

  + Detection by the detector to a depth of 0.3m

  + Mark, digging test and resolve signal to a depth of 0.3m

  + Detect bomb by detector to a depth of 5m (put in step with high sensitivity)

  + Excavation, checked resolve signal to a depth of 3m

  + Excavation, checked resolve signal to a depth of 5m

- Note: 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. Detailed design

98. Impacts.

If the detailed design does not consider the environmental issues (e.g. wrong site selection, not suitable construction technology, hazardous material use etc.), the subproject could cause some negative impacts during construction and operation phases. Particularly, (i) Wrong subproject site selection can increase the risks of being submerged during heavy flood or subsidence; (ii) Unsuitable selection of excavation, transportation of refused soil, materials, electric equipment, wire scatter method for constructing the TL section crossing over roads, rivers and canals. will severely affect to traffic on road and waterway as well as air, water and soil environment . In reality, the Phu Nghia – Xuan Mai TL will be crossing several roads, rivers, ponds and lakes as presented in the Table 27.

Table 27. Roads and water bodies crossed over by the Xuan Mai – Phu Nghia TL

No	Location	Intersect with
1	G2 to G3 in Hoa Thach Commune	Twice over mid and low voltage TLs, once over intercommunal road
2	G3 to G4 in Hoa Thach and Can Huu Commune	Once over Tich River dyke, once over Tich Giang River, several times over small rivers; 04 times over mid and low voltage TLs and once over a 8 m wide road.
	G5 to G6 in Can Huu and Dong Son Commune	Once over Tich River dyke and interdistrict road.
3	G10 to G11 in Phu Nghia Commune	03 times over pond, lake and swamp
4	G11 to G12 in Phu Nghia Commune	Once over irrigation canal
5	G12 to G13 in Phu Nghia Commune	Once over a pond
6	G13 to end point, in Phu Nghia IP	Once over IP road and Cuu Khe canal.

99. Mitigation measures

During detailed design, besides taking into account the safety and the effectiveness of the project; Consultants have considered the environmental issues for the design, specifically (i) Arrange transmission line direction to avoid risks of submerge and subsidence. During the preparation of the most recent feasibility study, the project management board has consulted Hanoi relevant authorities and the CPCs where the project will be crossing over for

agreement upon the location of SS and the transmission line, (ii) design the height to suspense wires of the overhead transmission line section to ensure electromagnetic field not affect people's health. EO of PMB with the support from PIC will be responsible for reviewing detailed design of the subproject to ensure proposed mitigation measures included in the detailed design. Furthermore, after feasibility study was approved, the PMB will notify the local authorities and people of activities and schedule of the subproject so that they can organize their production and business accordingly. HNPMU also complete requirements for the environmental assessment, coordinate in environmental protection monitoring, and notify the DoNRE the subproject commencement

d. Bidding document establishment

100. Impacts: If terms of reference content in the bidding documents of civil works and equipment supply exclude provisions for environmental protection, the constructors would not pay attention to implement the mitigation measures stated in EMP. It will result in disturbance and pollution during construction and operation phases of the subproject.

101. Mitigation measures: These impacts of the upcoming works shall be incorporated into the bidding documents. In which:

i. Environmental, health and safety provisions are subject to amendment and supplementation if EMP measures are not sufficiently detailed;
ii. Bidder is required to provide detailed work methodology in addition to SEMP. State in bidding documents that contractor must have experience in EMP implementation, or provide staff with sufficient experience; bidding document and construction contracts have to include provisions that require contractors to comply with the mitigation measures proposed in IEE.

The mitigation plan is organized into a series of mitigation sub-plans that address specific potential impact areas of the subproject. The sub-plans will assist the contractors with the development of their SEMPs as part of their bid documents, and ultimately will allow the EO/IA, PIC, and contractors to focus more or less on the different potential impact areas as they arise with the implementation of the final designs of the subproject. Therefore, EO of PMB have to ensure that the civil work contracts are included mitigation sub-plans of the EMP which are drafted for example for: a) trees and vegetation removal and Site Restoration, b) domestic waste from workers; c) refused excavated soil and other wastes; d) noise, dust, and exhausts; e) liquid wastes; f) construction and urban traffic; g) worker and public safety; h) cultural chance finds. The detail mitigation measures are described in EMP

e. Construction site arrangement

102. Impact: The construction site arrangement is very important regarding environmental impact reduction. The inadequate site arrangement can affect surrounding natural and social environment. There are several impact sources such as disposal site selection, the arrangement of material transportation and storage facilities. (i) The selection of disposal site in city is more difficult than that in rural area because of high population density and lack of land area; disposal site will affect local land area and cause pollution for citizens living near the site if the selection process is not careful; (ii) Inappropriate materials transportation route will affect to road traffic and air environment. Stockpile and material gathering site can cause temporary acquired land and affect to people living near the site because of the movement of vehicles in and out the stockpile, and dust around the gathering site.

103. Mitigation measures: Construction site arrangement includes,

i. Selection of disposal site: disposal site will be proposed and selected by the HANOI DPMB. The HANOI DPMB will be responsible for consultation with the local authorities to get their formal agreement and permission for this site before commencing the subproject. The PMB will require civil contractor to prepare a disposal plan. Based on this disposal plan, civil contractor will be responsible for contracting with specialized unit (e.g. Hanoi Urban Environment Company Limited) to collect, transport and dispose the refused excavated materials to the permitted disposal site.

ii. 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.

iii. The Contractor will arrange the temporary yards for stockpile and material gathering site within the tower foundation area or the ROW in order to avoid arising impacts due to land acquisition, potential air and water pollution.

iv. Contractors will obtain the license for safety and environmental requirements of mobilized machines and vehicles.

C. Potential Impacts and Mitigation Measures during Construction phase

104. The potential environmental impacts of the subproject are associated primarily with the construction phase of the subproject. These impacts and mitigation measures on the different environmental aspects are described bellows:

1. Potential impact of construction activities

a. Air quality

105. Impacts: Dust exhausts and noise generated by machines', equipment's and transportation means' activities; soil excavation of Phu Nghia substation, soil excavation of tower foundation pits of the overhead TL section will impact on ambient air environment. These impacts are short-term and will be stopped when the construction is completed. Specifically:

- Dust generated by soil excavation of Phu Nghia SS, of tower foundation pits of the overhead TL section and transportation of construction materials

The dust generated during construction of Phu Nghia SS is calculated as 1.6 g/day during a period of 30 days causing almost no impact on workers and residents in surrounding industrial zones and residential areas around the substation. Regarding Phu Nghia - Xuan Mai transmission line, the volume of dust to begenerated alongthe line from excavating foundations is estimated as8.67g/day during about 60 days. And dust generated in the process of transporting construction materials for Phu Nghia Substation and Phu Nghia – Xuan Mai TL is relatively low, 11.7 kg/day and 22.9 kg/day. Though it will be affecting surrounding residential area along transmission line, the impact level is much lesser in wide open space.

Exhausts such as NOx, SO_2, CO generated by construction machines' and equipment's, and transportation means' activities

The level of emissions during this period is subject to high fluctuated; it depends on the speed of vehicles, construction activity intensity, temperature, wind direction and speed in the region, soil moisture and air temperature during the day. The analysis results show that load of pollutants by vehicles incurred is minor. The vehicles will be operating within ≤ 20 km from the project area and the number of vehicles running in a specific period of time (per hour) is small. Therefore, the level of emissions impact is not substantial.

For Phu Nghia SS, asite is built within the industrial park the scope and magnitude of emissions will be narrow. The largest pollutant load of NOx is 0.017 mg/ms while thesmallest load pollutants SO_2 is 0.000031 mg/ms. These numbers for Phu Nghia – Xuan Mai TL are much higher, 0.044 mg/ms and 0.00008 mg/ms, respectively.

Noise generated by construction and transportation activities: Noise will be generated by activities of machines, equipment and means such as truck, bulldozer, excavator,… According to calculation results, noise generated by these machines, equipment and means will reduce lower than the allowable limit (70dB) at the distance of above 200m. The subproject area is far from the crowded residential areas. In addition the machines, equipment and means will be only operated in the daytime. Thus, noise impact is insignificant and short term. It impacts only on some households living along transport roads and near the construction site within the distance of 200m.

106. Mitigation measures

- Construction units will frequently spray water at the construction sites and along the transport roads crossing residential areas of Phu Nghia, Hoa Thach, Dong Son, Can Huu, Dong Phuong Yen communes and within the Phu Nghia Industrial Park to minimize dust. During the dry and hot days, spray minimum twice a day (6-7 am and 13-14pm) with specialized water tankers of 4.5m^3.
- 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.
- Contractors will ensure that transportation means, machines and equipment must have effective certificate of environmental standards achievement (QCVN 04: 2009/BGTVT and QCVN 05: 2009/BGTVT) issued by the register department before using for the subproject construction.
- The trucks transporting construction materials and excavated soil will be covered by canvas. The temporary stockpiles/storage yards in Phu Nghia SS area are: 45m^2 closed storage for cement; 150m^2 open storage for other types of materials and 100m^2 storage site for steel. Those areas will be covered, or sprayed regularly to prevent dust
- Reduce excavation and filling duration, and excavated soil will be used to fill as soon as possible to reduce dust emission.

Only operate equipment, machines and vehicles causing large noise at day time. .

b. Water quality

107. Impacts: Sources causing impacts on water environment include domestic wastewater and construction wastewater.

- *Domestic wastewater* is generated by worker's life activities. The water pollution from domestic wastewater depends on the number of workers and the working duration. The number of workers is 80 in Phu Nghia – Xuan Mai TL, 4 in Xuan Mai Substation and 30 in Phu Nghia Substation. The estimated amount of water supply per person/day is 100 liter; the amount of wastewater is calculated as 80%. Thus, the wastewater amount generated

daily in each construction site is small, about 6.4 m^3; 0.32 m^3 and 2.4 m^3, respectively. Though the Phu Nghia – Xuan Mai TL traverses a number of ponds, lakes and river (as shown in Table 27), the domestic wastewater would not cause pollution to those water bodies because the worker camps will be located far from water bodies. Impacts are most likely to occur in work camps and near construction sites. The wastewater analyses have been conducted for all thee locations during the subproject EIA preparation. The results show in Table 28 that, all water quality parameters exceed the allowable limit of National standard in QCVN 14: 2008/BTNMT (column B). Particularly, BOD_5 is exceeded 16 times, TSS 8 times and $NH4^+$ 8.7 times. If the wastewater is not treated properly, it will have substantial impacts on surrounding water environment.

Table 28**. Domestic wastewater pollution in the Subproject area**

Pollutant	Phu Nghia – Xuan Mai TL		Phu Nghia Substation		Xuan Mai Substation		Average concentration (mg/l)	QCVN 14:2008/ BTNMT Column B
	Pollutant load (g/day)	Discharge volume (l/day)	Pollutant load (g/day)	Discharge volume (l/day)	Pollutant load (g/day)	Discharge volume (l/day)		
BOD_5	5,200	6,400	1,950	2,400	260	320	812,5	50
TSS	4,800 ÷ 5,200		1,800 ÷ 1,950		240 ÷ 260		750 ÷ 812,5	100
NH_4^+	560		210		28		87,5	10
P_2O_5	136		51		6.8		21,25	-
Cl^-	800		300		40		125	-
Surfactant	160 ÷ 200		60 ÷ 75		8 ÷ 10		25 ÷ 31,25	10

(Source: Project's EIA report)

- *Construction wastewater* includes mainly water pumped from tower foundation pits, abundant water from concrete maintenance of tower foundation pits, abundant water from concrete mixing. The tower foundation pit pumped sewage consists mainly suspend solid, mineral salt and organic matter washed from the ground surface. Thus it can cause high turbidity of surface water sources near to the subproject site. Wastewater from concrete maintenance of tower foundation pits and concrete mixing includes only suspend solid without hazardous substances that can impact water environment. Furthermore, the construction works will be taken place in dry season, so the volume of construction wastewater will be small. It is expected that an amount of construction wastewater of 0.5 – 1 m^3/day is generated from construction of Phu Nghia substation.

- 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.

108. Mitigation measures

* For domestic wastewater: Hire local people's houses for workers' stay where the hygienic/sanitation conditions are better than that from worker camps. Only construct camps for the TL sections far from the residential areas. In the case worker camps need to be built, provide mobile toilets with septic tanks to locate at the workers' camps. Periodically hire competent unit to collect toilet waste according to regulations. Construct preliminary wastewater treatment system to treat domestic wastewater before discharging into water bodies.

* For construction wastewater:

- For substation, construct construction sewage collection holes for depositing suspended solid before wastewater flows into Tien Sa Lake, irrigation canal and Cuu Khe canal. The detail for technical specification for these holes is depended on each tower foundations or each excavated holes. The common dimensions can be 0.5mx0.5mx0.4m (height x wide x deep).
- For TL, to reduce impact from water runoff, make an earth dyke to prevent construction wastewater flows directly to the water bodies or create a vegetation buffer zone along lake/pond/ Tich river to treat preliminarily construction wastewater before discharging into water bodies.
- 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 be collected and treated at these garages as stipulated.

c. Soil environment

109. Impacts: Sources causing impacts on soil environment include: impacts due to domestic and construction solid wastes, and impacts due to tree clearance under the ROW causing soil erosion.

- Impacts due to domestic solid wastes created by workers' daily-life activities. The number of workers is about 114 people. Thus, the domestic solid waste volume is about 57kg/day and it can be controlled. The composition of domestic solid wastes includes: organic matters, plastic, paper, glass and other inorganic matter, of which organic matters are accounted for the main part. The domestic solid waste can contain pathogenic bacteria/viruses that are

harmful for human health and domestic animals. The total amount of hazardous waste (fluorescent lamps, spent oil, cleaning cloths, battery, used paint and plastic) is about 15kg/day.

- Impacts due to construction solid wastes created by construction activities. These wastes include: refused filled and excavated soil and rock, fallen materials; empty cement sacks, wooden barrel used for packaging equipment and devices, clouts etc. The total excavated volume for the Phu Nghia Substation is 1,134.5 m3 and for the TL is 12,315.8m3. 1/5 of the excavated soil will be reused for filling works. The remaining volume is transported and stored in a vacant place designated by local authority.

Refused construction materials, empty cement sacks, steel, lubricants, fuels, and wood debris will be generated during the construction process. Packaging materials such as wooden barrel, plastic, foam, cardboard boxes used for equipment and devices, electrical parts will also be generated.

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

Since all sensitive receptors around the subproject site are not agricultural land or forest/garden (see Table 23) the effect of solid waste on soil in negligible

110. Mitigation measures

- Contractor will set up dust bins for collecting rubbish at the worker camp sites. Then hiring Hanoi Urban Environment Company Limited to collect, transport to the land field site. Hazardous waste will be collected and treated separately for treatment as regulations
- Worker camps must have adequate domestic waste collection facilities and sufficient pit latrines that are located away from public areas and surface waters.
- Utilize salvage excavated soil, rock for filling cable trench, consolidating tower foundations according to excavation and filling balance method. For excavated soil which cannot be reused, it will be collected and transported to the disposal site agreed by the local authorities through consultation with them.
- 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.
- Dedicated fuel storage areas must be established away from public areas and marked clearly. Waste oil and grease will be stored in a tank then disposed and treated as hazardous waste
- Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.
- Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.
- Completely finish each work item before start other one. Conduct site cleaning, leveling and compaction after construction completion to return the ground for local people to continue their production or grow trees on the site.
- Present and past land use will be reviewed to assess whether excavated soils are contaminated. If any, contaminated soil should be treated, disposed at a disposal area or a location approved by the DoNRE.

Selection of disposal site: Domestic solid waste is collected and handled by the environmental sanitation cooperatives of the communes. Total domestic solid waste amount is gathered and disposed in Xuan Son landfill- Son Tay town, Hanoi city. The remained construction waste, which can not be recycled, is gathered by constructors, who will rent the collection unit to dispose at the construction waste landfill located in Duc Tu Commune, Dong Anh District, Hanoi.

d. Impacts on Local Traffic

111. Impacts

The overhead TL section crosses over roads 3 times. Once it crosses over intercommunal road crosses, once crosses over 8 m wide road and one crosses inter-district road. Therefore, construction, transportation of construction materials, wire scatter and pull of the overhead TL section can cause existing road surface and foundation collapse, increase in the quantity of transportation means on roads, increase in traffic jam and increase in risk of traffic accidents. During the construction of the transport activities of materials for the construction will increase the volume of traffic in NH6, the roads in Quoc Oai district, Chuong My district, Phu Nghia Industrial Park route and inter-village roads passing the Project area. A number of 30 times of trucks per day is projected for the construction of Phu Nghia – Xuan Mai transmission line and Phu Nghia SS. This may probably contribute to more traffic jams during peak hours, increase traffic accidents, and affect the quality of local roads. Dropping out of transported materials will also increase dust and traffic accident risks. There will be no impact on sensitive receptors (see Table 22).

112. Mitigation measures

- Prepare implementation alternative for the TL at every inter-cross location.
- Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities.
- Arrange reasonable work to avoid traffic obstacle.
- At the locations where the overhead TL section crossing over the roads, it need to set up scaffolding during wire scatter and pull process.
- Set up signal light when constructing at night.
- Put up warning boards at dangerous road sections where traffic accidents can occur.
- Speed limits should be posted and adhered to by transportation means serving the subproject construction.
- Limit transportation of materials in rush-hours to avoid traffic jam.
- Transport materials with the allowable load. Not expand trucks' body.
- Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.

e) Other TLs and communication lines

113. Impacts: According to survey, the TL will not cross over any communication lines, thus there is no impact. The TL will cross over low, medium and high voltage TLs 6 times at the section G2 to G4 in Hoa Thach and Can Huu Commune. Thus, wire pull and scatter at locations where this TL crosses over other TLs, power of those TLs may be cut off. However, time for wire pull and scatter is short and only during the day, therefore power will be only cut off in each local area at specific time. Impact is assessed insignificantly

114. Mitigation measures:

- Coordinate with management unit of the TLs to cut off power to ensure safety during wire pull and scatter process at the inter-cross locations if any.
- Inform people for their life and production arrangement before cut-off power.
- Put up scaffolding during wire scatter and pull process. Put warning boards. Have protection measures to prevent impact on other TLs. Ensure safety distance to those TLs.

g. Occupational health and safety of workers

115. Impacts: Construction activities may cause health harm and danger of the workers' lives, specifically: i) Workers can get some disease due to unhygienic condition of worker camp; ii) Accidents can be happened during operation of machines, vehicles or working at height; iii) Traffic accident during transportation of facilities, materials for construction of the subproject; iv) Transporting and erecting heavy towers; and v) Electric shocks during connecting and testing electric with the existing substations. These impacts last during the construction phase and will stop when the subproject construction phase finishes.

116. Mitigation measures:

- Health and safety plan (HSP) will be prepared and implemented by the contractor.
- All workers will be examined health, especially people working at height, and equipped sufficiently labor protection tools such as hard hats, safety gloves, safety belt, ear protection etc. This must be strictly imposed.
- All construction equipment, tools will be carefully examined for quality and quantity before used. For people working at height, the suspending cables will be carefully checked before climbing on the tower; no work at height will be permitted when it is going dark; it has fogs; it has strong wind with above class V. Workers who climbs on towers must have Safety Certificate of Class 3 or above, and sufficient conditions for working at height. Safety belts will be attained use standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers will wear safety belts and the safety leather belts must be tightly tied with the tower.
- Carefully check boom guy, cable clip before load heavy objects.
- For tower foundation excavation:
    - Strictly implement safety measures while excavating tower foundation pits.
    - Apply measures to consolidate the slope of tower foundation pits in dangerous positions during construction;
- Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation.
- Strictly comply with safety norms for installation of electrical equipment and relative regulations.

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

h. Community health and safety

117. Impacts: Subproject construction would cause impacts to community health and safety as followings: i) Accidents due to increased traffic activities from the transport of materials, concentrating in NH6 and inner roads within Phu Nghia Industrial Park and several inter-district roads; ii) Fires, emergency spills of materials, especially in temporary storages of fuel and inflammable material (paint, gas, DO, FO etc.); iii) Accidents of residents if they enter into work areas without permission, for example, falling into holes, electric shock during testing electric, running generators etc. These impacts are insignificant and short-term, they occur only in the construction phase and will stop when the project construction finishes.

118. Mitigation measures: To mitigate these potential impacts, the civil contractor will develop a community health and safety plan (CHSP) that incorporates good international best practice and recognized standards. The CHSP should include emergency response and preparedness procedures to be developed in close consultation with potentially affected communities and local authorities. The plan should include specific emergency response procedure, communication systems and protocols, interaction with local and regional emergency and health authorities, provision of emergency equipment and facilities such as fire truck, emergency service vehicles…. The CHSP should also include the requirement for the erection of safety barriers either as tape or fencing as determined by the risk to prevent unauthorized access to the construction areas. Warning signs around sites are to be printed clearly in Vietnamese language.

- Set up warning boards on all high voltage towers to warn people not to be in contact with them.
- Installation of lightning protection systems in all towers as stipulated. Paint color (as defined) on tower with the height of 50m and above.
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of firefighting.
- Check periodically trees outside the ROW which may potentially affect to the safety of the tower
- Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW to communities living near areas where the TL crosses over.

The contractor will be responsible to implement these measures of. HANOI PDMB will be responsible for including these requirements in the contract documents.

k. Social aspects

119. Impacts: Concentration of workers (114 people) in the subproject site may cause disorder, insecurity and disturbance in the locality due to conflicts between workers and local people, social evils; increase posible infectious diseases generation etc. However, these impacts are insignificant, short-term, only occur in the construction phase along 11km of TL and within a small area in Phu Nghia Industrial Park and will stop when the project construction finishes. The installation of new bay in Xuan Mai SS is unlikely to have such kind of impact.

120. Mitigation measures

- Local labors will be hired as much as possible to prevent or minimize influx of migrant workers, and incidence of social diseases and community chaos.
- Manage and educate workers to enhance their awareness of environmental sanitation and health protection.
- In order to minimize the risk of injury to the local residents and the workers, it needs to comply with the GOV's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed.
- 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 should also establish the relationship with the local authorities to discuss and take decisions necessary for their management.
- Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws.
- Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education should be given to workers.
- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.

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

121. 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, culverts, drainage system and public infrastructures damaged by the subproject construction.
- Clear, level and restore the ground after construction completion. Grow trees in temporarily acquired areas.
- Grow trees in temporarily acquired areas.

D. Potential Impacts and Mitigation Measures during Operation phase

121. The potential impacts of the operation of the completed 110 kV Phu Nghia substation and 110kV Phu Nghia – Xuan Mai transmission line and mitigation measures for the impacts are described as follows:

a) Ecological environment

122. Impacts

During the operation phase, the process of periodic maintenance and repair of the TL, branches and tops of the trees violating the TL safety inside the ROW, and trees outside the ROW with the risk of falling down or branches affecting to the ROW must be trimmed and cut down. According to the survey result, the transmission line mainly crosses over paddy and crops land. Therefore, after the TL is come into operation the maintenance and repair process will have little impact on biological environment.

After the construction is completed, and the TL is come into operation, people are allowed to cultivate again within the ROW area, but to a limited extent under the Electricity Law, Decree 14/2014/ND-CP to ensure safe operation of the transmission line.

123. Mitigation measures

Cut down only trees and branches which will get risk of the safety of the transmission line as specified in the Decree No. 14/2014/ND-CP of the Government dated February 26th, 2014. Take care of plants inside and outside the scope of the ROW are as follows:

**Trees, crops in the ROW:* According to Decree No.14/2014/ND-CP, rice and crops must be away from electric tower foundations at least 0.5m.Trees can be grown within the ROW but the vertical distance from the highest point of tree to the height of the lowest conductor of 110kV transmission line while in maximum deflection state must not be less than the distance from the following regulations:

For the transmission line outside city, town, the vertical distance from the highest point of the tree to the height of the lowest conductor while in maximum deflection state must not be less than 3.0 m for 110kV voltage level.

**Trees outside the ROW:*

In case where there are trees outside the ROW of the overhead transmission line and outside city, town, the distance from any part of the fallen tree to any part of the transmission line must not be less than 1.0m for 110kV voltage level. For valuable trees growing rapid in

the short term with the risk of causing unsafety for the TL, they must cut down and forbid to be grown newly in order to not impact on economic effect.

- It will be not allowed to cut down or trim trees and branches of trees which locate outside the ROW without affecting to the safety of the TL during operation.
- Use manual method to clear plants. Do not use herbicide for plant clearance.
- Trees and branches of trees which are cut down will be collected by local people for firewood or the operation agency will contact to local authorities to collect, transport and handle them as stipulated.
- Recommend local people to grow treestheir height meets the requirements of height as stipulated. Local people will not be allowed to grow valuable trees growing rapidly and their height might exceed the allowable limits, affect to the safety of the TL.
- Propagandize, train operation workers on prevention measures from forest fire; Strictly control fire use of operation workers during the TL maintainenance and repair process to avoid forest fire occurence.
- Apply adequately fire fighting and protection requirements during installation and construction to avoid forest fire. Set up rules, fire forbidding signs in places where fire is forbidden.
- Operation unit is responsible for establishing rules on fire fighting and prevention. Arrange necessary tools and means for firefighting as stipulated.
- Be legal responsible for the occurrence of forest fire during the maintainenance and repair process.
- In case forest fire occurrence, stop all works to forcus workforce, tools and means on fire fighting. Inform immediately to firefighting police, local authority and people for coordinating firefighting. The PO will be responsible for all cost of firefighting and vegetation recovery.

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

124. Impacts

The occupational health and safety issues during the operation of high voltage TL include electrocution risk due to exposure to high voltage systems when maintaining and repairing the TL or living under the ROW; accident risk due to working in heights; potential exposure to electric and magnetic fields when maintaining and repairing the TL or living under the ROW. Other accidents that may occur include lightning, fire and explosion, tower collapse.

- 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.
- Working at height: Accidents may occur when working at height. However, a working safety plan may be implemented to reduce risks that include testing of structural integrity prior to proceeding with the work and the use of fall protection measures.
- Exposure to electric and magnetic fields (EMF): Typically, workers repairing and maintaining the TL have higher exposure to EMF than community because of working in close proximity to electric power equipment.
- Impact of EMF on operators when conducting the TL maintainenace and repair is follows:

- For the overhead TL section: Under the Decree No. 14/2014/ND-Cp dated Feb. 26th, 2014 promulgated by the GoV, working time at place with EMF is regulated as in Table 29:

Table 29. EMF intensity and allowable limits of working time during one day

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

Using observations of EMF in an operational 110kV substation under similar circumstances (see the Table 30 below for Gia Lam Substation), and given that operators of the TL are arranged to work in shifts, 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 insignificantly.

Table 30. 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: Phu Nghia EIA report 2014)

125. Mitigation measures: The Operator of the TL will follow the IFC (2007) and EVN guidelines when carrying out maintenance of the 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.
- Proper grounding transmission line.
- Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or if working in close proximity to the TL.

Follow safety measures when working at height during maintenance and repair the TL, particularly:

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

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.

In addition, in the operation phase, training for workers will be conduct 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, explosion, tower collapse. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the T/L. Equipment maintenance areas will be located away from the residential areas.

c. Community Health and Safety

126. 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). Effects reduce with distance and electric fields also become shielded by trees, buildings, and other materials that conduct electricity. In general electric fields are the strongest close to the source and diminish with distance.

- The subproject will be designed and constructed in compliance with regulations on technique and high voltage network, EMF must be ensured ≤ 5kV/m at any point outside the houses at the height of 1m from the ground and ≤ 1kV/m at any point inside the houses at

the height of 1m from the ground.Furthermore, according to observation results, EMF intensity in Xuan Mai SS is 1.8 – 2.7kV/m,lower than the allowable limits (≤ 5kV/m), and EMF intensity in 6 pointsalong Phu Nghia TL is undetected. Therefore, impact on local people caused by forcasted EMF of this subproject will be negligible.

127. Mitigation measures:

To prevent electrocution risk, the TL Operator will implement the following:

- Conduct earthing for the TL, especially all towers.
- To ensure absolute safety, operators must comply with operation procedures and safety requirements;
- Provision of warning signs and anti-climbing devices on all towers.
- Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the TL.
- Check earthing system of buildings under the ROW as stipulated. Ensure that any new buildings within the 72 m-wide earthing zone are earthed.
- Observe/Test EMF at resident's buildings for treating appropriately if any complaint.

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 transmission system and power lines through warning signs and the restrictions on erecting any houses or buildings within the ROW and earth zone are to be enforced by operation unit.

128. Climate Change. Regional Global Circulation modeling project green house –climate change induced changes to the frequency and severity of rainfall events in the subproject area. However, there are no records of flooding in the area of Phu Nghia substation in Phu Nghia Industrial Park. However, short time flooding may occur due to low discharge rate of irrigation system. It is concluded that impacts from climate change may not impose long term risks for the whole substation area.

PUBLIC GRIEVANCE REDRESS MECHANISM

129. 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. All APs will be made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process will be published through an effective public information campaign. The grievance redress mechanism and appeal procedures will also be explained in a subproject information booklet (PIB) that will be distributed to affected commune. Affected people can have this information from commune office.

130. 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.

131. 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/IA5, and ADB upon request.

132. The procedures for grievance redress is defined below and summarized in Figure 4. 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.

[5] See Section XB below for institutional responsibilities for EMP

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) Stage 6: 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).

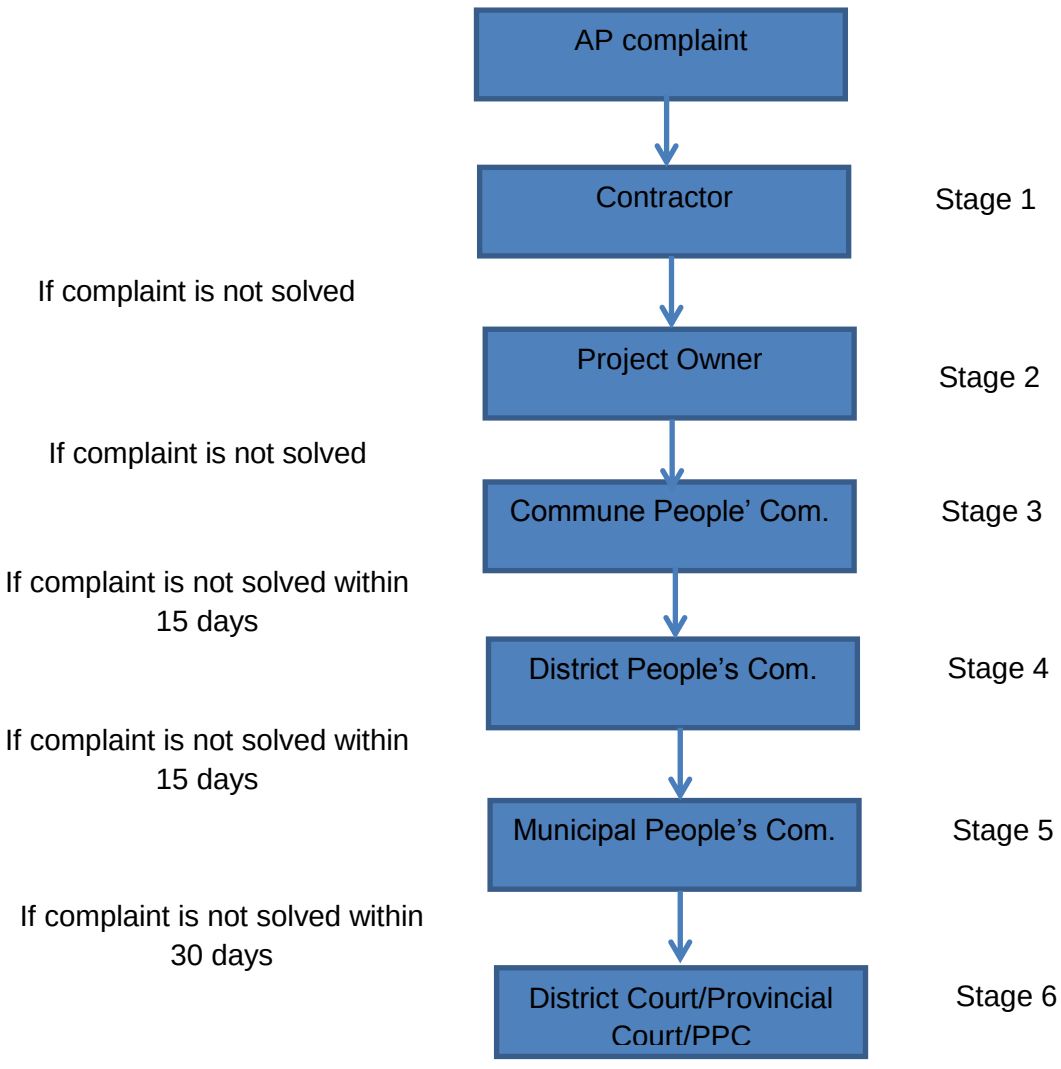

Figure 5.Summary of GRM

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

134. 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.

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

VIII. ENVIRONMENTALMANAGEMENT PLAN

136. An EMP has been prepared for the subproject “110kV Phu Nghia Substation and 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.

137. The EMP consists of an impacts mitigation plan, a monitoring plan, and an emergency response plan. EMP also prescribes the institutional responsibilities for the implementation of the EMP. EMP is a management tool that provides a set of directives and guidelines that the subproject owner follows to prevent or minimize unnecessary environmental impacts of the subproject.

138. Environmental impact mitigation plan has been developed based on each subproject activities with respective impact and mitigation measure. Also, the plan identifies the reports, responsibility of subproject’s stakeholders as well as estimated cost for implementing mitigation measures. Detailed contents are shown in Table 31.

Table 31. Environnemental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
Pre-Construction, Detailed Design Phase								
Detailed designs, bidding document establishment, the project approval land submission	No impacts. But the activities will design and proposed mitigation measures for impacts during construction and operation phase	1. Work with the PIC to supervise the subproject detailed designs. Ensure the following contents: • Select the TL alternative to minimize land acquisition, especially agricultural lands; design the height of tower to minimize trees and crops clearance and cutting when constructing the subproject. • Select the TL direction to avoid or minimize disruption, impacts on traffic activities. • During the feasibility study, the subproject management board has to consult with the Department of Industry and Trade of Hanoi City, the DPC of Chương My, Quoc Oai and the CPCs where the project crossing over for agreement upon the location of the transmission line. • EO of PMB with the support from PIC will be responsible for reviewing detailed design of the subproject to ensure proposed mitigation measures included in the detailed design. 2. After feasibility study was approved, notify the local authorities and people of activities and schedule of the subproject so that they can organize their production and business suitably. Coordinate in environmental protection monitoring, and notify the DoNRE the subproject commencement to complete requirements for the environmental assessment, and give permission and certificates for the subproject in the subproject implementation process. 3. State in bidding documents that contractor must have experience in EMP implementation, or provide staffs with sufficient experience; bidding document and construction contracts have to include provisions that require contracts to comply with the mitigation measures proposed in IEE	Subproject location	Before the commencement construction	When designing details, establishing bidding documents, and when feasibility study is approved	No marginal cost	PIC	IA/EO

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

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		4. Ensure that the civil work contracts are included mitigation sub-plans of the EMP.						
Land acquisition and compensation	Impacts on local people's life and economy	5. 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. 6. Affected persons are informed ahead of the subproject implementation and participated in acquisition and inventory of land, consulted in compensation, assistance. 7. 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. 8. Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations. 9. Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations 10. Budget for compensation payment must be enough and available. 11. Construct completely each work item to minimize the duration of temporary land use for the project construction. 12. 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	13. Before preparing and clearing site for constructing the project, it is necessary to coordinate with the competent agency for UXO disarmament in the proposed project area. Area of UXO disarmament is about 2.4 ha.	All construction sites	At the beginning of the subproject construction	Once	See monitoring plan below	EO/IA	EO/GOV
Training and capacity	Prevent of impacts through education	14. Implement training and awareness plan for IA/ESU/EO and contractors.	ESU office, construction sites	Beginning of construction	After each event	No marginal cost	PIC	PIC/ESU
Construction site arrangement	No impact. This activity help to prevent or avoid impacts by disposal and civil works	15. PMB will be responsible for selection of disposal site, consultation with the local authorities to get their formal agreement and permission for this site before commencing the subproject and civil contractor is required to prepare a disposal plan for implementation. 16. The PMB requires civil contractor to prepare a disposal plan. Based on this disposal plan, civil contractor is responsible for contracting with	Subproject site	Before construction begins	01 time Before construction begins	No marginal cost	PO/PMB/PIC	PMB/contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		specialized unit to collect, transport and dispose the refused excavated materials to the permitted disposal site. PMB is responsible for supervision and include this content in civil work contracts 17. Constructor develops transportation plan for equipment and materials to reduce negative impacts. 18. Constructor will arrange the temporary yards for stockpile and material gathering site within the tower foundation area or the ROW. 19. Contractors must have the license for safety and environmental requirements of mobilized machines and vehicles.						
Construction Phase of Phu Nghia 110 kV Substation and transmission line								
Initiate EMP and sub-plans,	Prevent or minimize impacts	20. Initiate updated EMP including individual management sub-plans for different potential impact areas	For all construction sites	Beginning of construction	Once	No marginal cost	IA/PIC	ESU and contractors
Tree cutting and site clearance	Cause the loss of vegetation and landscape deformation	21. Only cut down trees at the tower foundation construction locations, within the lines of wire pull and scatter, and trees (both within and out of the ROW) whose height exceed the allowable limits and may impact on the TL safety. 22. Use manual method to clear plants. Not use herbicide for plant clearance. 23. Completely construct every work. Arrange construction after harvest to reduce impact on people's production and reduce temporary acquisition time. 24. After completing the construction, temporarily acquired land will be cleared, leveled, compacted to return to people for continuing their production at limit level as stipulated. 25. The PO in coordination with the local authorities to monitoring the tree cut down and clearance for subproject construction. 26. Set up rules, fire forbidding signs in places where fire is forbidden, or near combustibles. Forbid arc welding, gas welding in areas where there is gasoline, flammable substances. Forbid the use of electricity for unregulated cooking. 27. Contractor is responsible for establishing rules on fire fighting and prevention. Arrange necessary tools and means for firefighting as	All construction sites	From the beginning to completing the subproject construction	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		stipulated.						
Concentration of workers and domestic wastes generated	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	28. Hire residents' houses for workers' staying. Only construct camps for the TL sections away from the residential areas. 29. Contractors consider unskilled jobs for hiring local labors to conduct to prevent or minimize influx of migrant workers, and incidence of social diseases and community unrest. 30. Hire mobile WC with septic tank for camps and put dustbins at camps for collecting domestic sewage, rubbish and treating them adequately. 31. Worker camps must have adequate rainwater drainage system. 32. Examine periodically worker health. Equip medicine cabinet for protecting workers' health in time. 33. Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers. 34. Establish the specific food safety regulations for construction workers. 35. Construction units should implement temporary residence registration for all construction workers to CPCs within the project area. They should also establish the relationship with the local authorities to discuss and take decisions necessary for their management 36. Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws. 37. Establish rules in camp. Propagandize, educate workers and create good relations with people in order to avoid conflicts arising. HIV/AIDS education should be given to workers. 38. 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.	All worker camps	Throughout construction phase	Monthly	No marginal cost	IA/EO	ES/contractor
Refused rock and soil, debris, other hazardous wastes generated by rock and soil filling and	Cause soil and surface water pollution by refused rock and soil, debris, other hazardous	39. Max. salvage excavated soil, rock for filling cable trench, solidating tower foundations according to excavation and filling balance method. 40. 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.	All construction sites	Throughout construction phase	Monthly	See Environmental Monitoring Plan (EMoP)	PIC / EO and DONRE	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
excavation for tower foundation pits, cable trenches, tower installation, and equipment, devices, machines and transportation means	wastes	41. 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. 42. If excavated soil is suspected contamination, it must be tested, and disposed in designated sites and identified as per local regulations. **Hazardous waste impact mitigation** 43. For refused grease, oil: implement equipment, machines and vehicles repair and maintenance at local garage. Waste grease, oil will be collected to treat at this garage as stipulated. 44. Other wastes such as paint containing can; clouts with oil, grease; failed fluorescent lamp,…must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.						
Construction activities and transportation of materials	Noise, dust and exhausts impact on ambient air environment quality	45. Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certificate of environmental standards achievement issued by the register department. 46. Frequently water the construction sites and construction material transportation roads. 47. Means transporting construction materials in and out of the project site must be covered by canvas. 48. Cover canvas or water materials storage yards/stockpiles such sand, cement, filling soil etc. 49. Reduce excavation and filling duration, and excavated soil should be used to fill right after complete work. Implement appropriately equipment, machines and vehicles maintenance.	All construction sites	Beginning of construction (for license of equipment, machines and means) and throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
Construction materials and transportation, storage	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	***For road and traffic activities**:* 50. Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities. 51. Arrange reasonable work to avoid traffic obstacle. 52. At the locations crossing over the roads, it needs to set up scaffolding during wire scatter and pull process. 53. Set up signal light when constructing at night. 54. Put up warning boards at dangerous road sections. 55. Speed limits should be posted and adhered to by transportation means. 56. Limit transportation of materials in rush-hours. 57. Transport materials with the allowable load. Not expand trucks' body. 58. For oversize and/or overweight materials and equipment, it must have special purpose transport means. 59. Conduct road upgrading or repair if collapse occurrence due to the subproject construction. 60. Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.	All construction sites.	Throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/contractor
Soil erosion	Increase in the turbidity of surface flow, the loss of soil nutrients	61. Only cut down trees within the defined scope (under the ROW and some trees out of the ROW which may be impact on the safety of the TL). Salvage branches, trunks of trees cut down for fire. The remaining part of trees cut down and can't be salvaged will be collected and treated like rubbish. 62. Construction to where, cut trees to that in order to avoid bare land for a long time to reduce soil erosion and washing due to rain. 63. Earthworks should be conducted during dry periods. 64. Max. salvage excavated soil, rock for filling cable trench, solidating tower foundations according to excavation and filling balance method. 65. 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.	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		66. Compact at places with soil filling and excavation activity to mitigate soil erosion and washing. 67. Completely construct each work item. Construction completion to where, site cleaning, leveling and compaction to return the ground for local people to continue their production or grow trees to that.						
Occupational health and safety of workers	Worker injury and health	68. Health and safety plan (HSP) will be prepared and implemented by the contractor. 69. All workers must be examined health, especially people working at height, and equipped sufficiently labor protection tools. This must be strictly imposed. 70. All construction equipment, tools should be carefully examined for quality and quantity before used. For people working at height, it should carefully check the suspending cables before climbing on the tower; not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. Workers who climbed on towers must have Safety Certificate of Class 3 or above, and sufficient conditions for working at height. Safety belts should be attained use standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers must wear safety belts and the safety leather belts must be tightly tied with the tower. 71. Carefully check boom guy, cable clip before load heavy objects. 72. For tower foundation excavation: (i) Strictly implement safety measures while excavating tower foundation pits. (ii) There are measures to consolidate the slope of tower foundation pits in dangerous positions during construction; 73. Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation. 74. Strictly comply with safety norms for installation of electrical equipment and relative regulations. 75. Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment. 76. Use specialized tools and devices to anchor, fasten electrical	All construction sites.	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes. 77. 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. 78. 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. 79. All towers, steel structures and equipment must have earthing system. 80. 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. 81. As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp. 82. PMB will be responsible for including these requirements in the contract documents.						
Community health and safety	Local people injury and health	83. Civil contractor will be required to develop a community health and safety plan. 84. Set up warning boards on all high voltage towers to warn people not to be in contact with them. 85. Installation of lightning protection systems in all towers as stipulated. Paint color (as defined) on tower with the height of 50m and above. 86. When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting. 87. Check periodically trees outside the ROW which may potentially affect to the safety of the tower.	All construction sites.	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		88. Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW to communities living near areas where the TL crosses over. 89. PMB will be responsible for including these requirements in the contract documents.						
Construct drainage system of rainwater, water pumped from the foundation pits	Deposit mud sand; reduce suspended solids in surface rainwater and water pumped from the foundation pits; prevent rainwater and water pumped from the foundation pits from overflowing on the ground	90. Provide drainage system of rainwater, water pumped from the foundation pits when constructing to prevent standing water and local flooding; deposit mud sand; reduce suspended solids in surface rainwater and water pumped from the foundation pits before pumping into environment. 91. Install temporary storm drains or ditches for construction sites 92. Ensure connections among surface waters (ponds) are maintained or enhanced to sustain existing storm water storage capacity. 93. Protect surface waters from silt and eroded soil. 94. Arrange construction sewage collection holes for depositing SS before running into surface sources.	All construction sites.	Design and construction phases	Monthly	No marginal cost	PIC/EO	ES/contractor
Detect cultural and historical properties or values	Avoid damage to cultural and historical properties or values	95. Chances of detection of valuable relics and cultural values should be anticipated by contractors. Site supervisors should be on the watch for finds. 96. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. 97. Work at the found site will be stopped until DoCST allows to be continued working.	All construction sites	At the begging, and throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/contractor
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	98. Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by TL construction. 99. Clear, level and restore the ground after construction completion. 100. Grow trees in temporarily acquired areas.	All construction sites.	throughout construction phase until the project is put into operation.	Monthly	No marginal cost	PIC/EO	ES/contractor
Post-construction Operation of Phu Nghia 110 kV Substation and transmission line								

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
Cut trees and branches violating the ROW	Reduce vegetation cover, lost of biological environment	101. Cut down only trees and branches which will get risk of the safety of the transmission line as specified. 102. Comply with regulations for growing plants inside and outside the ROW. 103. It will be not allowed to cut down or trim trees and branches of trees which locate outside the ROW without affecting to the safety of the TL during operation. 104. Use manual method to clear plants. Not use herbicide for plant clearance. 105. Trees and branches of trees which are cut down will be collected by local people for firewood or the operation agency will contact to local authorities to collect, transport and handle them as stipulated. 106. Recommend local people to grow trees whose height meets the requirements of height as stipulated. 107. Propagandize, train operation workers on prevention measures from forest fire; Strictly control fire use of operation workers during the TL maintenance and repair process to avoid forest fire occurrence. 108. Apply adequately fire fighting and protection requirements during installation and construction to avoid forest fire. Set up rules, fire forbidding signs in places where fire is forbidden. 109. Operation unit is responsible for establishing rules on fire fighting and prevention. Arrange necessary tools and means for firefighting as stipulated.	ROW	Fulltime	Biannual	O and M	The high voltage grid management of Ha Noi City	
Occupational health and safety of the workers during the TL periodic maintenance process	Affect workers' health and safety	110. Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers. (ii) Adherence to electrical safety standards. (iii) Proper grounding transmission line. (iv) Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or if working in close proximity to the TL. 111. Follow safety measures when working at height during maintenance and repair the TL, particularly:	ROW	Fulltime	Biannual	O and M	The high voltage grid management of Ha Noi City	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		(i) All workers must be examined health for working at height, equip sufficiently labor protection tools and cloths. (ii) Workers who climbed on towers must have Safety Certificate of Class 3 or above and sufficient conditions for working at height. Safety belts should be attained used standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers must wear safety belts and the safety leather belts must be tightly tied with the tower. (iii) All equipment, tools and means should be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the tower. (iv) Not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. 112. Occupational EMF exposure should be minimized through the implementation of an EMF safety program that includes: (i) Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones (ii) Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones. (iii) Utilization of personal monitors during work activities. (iv) Post safety signs and warning signs. 113. In addition, in the operation phase, conduct training for workers in order that they can respond to risks/failures and meet the operation procedures. An emergency and safety guideline needs to be prepared and disseminated to the workers for handling risks/failures occurring in the operation process. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the T/L. Equipment maintenance areas must be located away from the residential areas.						
Community Health and Safety		114. To prevent electrocution risk, Hanoi Power Company will implement the following: (i) Conduct earthing for the TL, especially all towers.	ROW	Fulltime	Biannual	O and M	The high voltage grid management of Ha Noi City	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[6] (USD)	Responsibility	
							Supervision	Implementation
		(ii) To ensure absolute safety, operators must comply with operation procedures and safety requirements; (iii) Provision of warning signs and anti-climbing devices on all towers. (iv) Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the TL. (v) Check earthing system of buildings under the ROW as stipulated. Ensure that any new buildings within the 72 m-wide earthing zone are earthed. (vi) Observe/Test EMF at resident's buildings for treating appropriately if any complaint. 115. To prevent impacts of EMF: the community should be warned about the safety distances from the transmission system and power lines through warning signs and the restrictions on erecting any houses or buildings within the ROW and earth zone are to be enforced by operation unit.						

A. Institutional arrangements and responsibilities

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

- ✓ Electricity of Vietnam is the Executive Agency responsible for implementing the entire project and implementation of the EMP and in the case of necessity will review and adjust the EMP accordingly. Hanoi Power Management Board representative of the Contractor will directly implement all related content, including direct responsibility for the management, implementation, support and supervision of compliance of contractors; evaluate EMP performance and report to EVN and ADB upon request.
- ✓ 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.
- ✓ The Environmental Supervisor of the Contractor supervise the Contractor's compliance with the EMP, environmental monitoring in the field. Local governments and communities are responsible for monitoring the implementation of the EMP as brought forward in the commitment of the Contractor.
- ✓ The Department of Natural Resources and Environment (DoNRE) is the provincial agency which oversees environmental management of Ha Noi. 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 provides guiding documentation for EVN or PMU on issues related to EMP, and evaluate the periodic reports on activities of EMP submitted.

157. The specific responsibilities of the parties concerned are indicated in the Table 32:

Table 32. 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 • Review reports of the Independent Environmental Monitoring Consultant (IEMC). • Approve changes in EMP if necessary
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 sub-plans
	• Supervise EMP performance
	• Report EMP performance to EVN, ADB
	• Prepare summary reports on Project's environmental activities

Stakeholder	Responsibilities
	upon request
	• Brief the Project's information in community meetings
	• Ensure continuing communication with local communities and fulfill commitments to facilitate for community consultations during project life.
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 in reviewing detailed design for the subproject to ensure mitigation measures being incorporated.
	• 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 update EMP as necessary
Contractor	• Prepare and keep records and necessary data as required in EMP and submit to Supervision Consultant
	• Ensure that workers are informed of purposes of EMP and aware of necessary measures to implement EMP
Local authority and community	• Participate in monitoring EMP implementation

B. Monitoring Plan

158. The environmental monitoring plan for the EMP is provided in Table 33. The monitoring plan focuses on all three phases (pre-construction, construction, post-construction operation) of the subproject and consists of environmental indicators, the sampling locations and frequency, method of data collection, responsible parties, and estimated costs. The purpose of the monitoring plan is to determine the effectiveness of the impact mitigations, and to document any unexpected positive or negative environmental impacts of the subproject

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

160. 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) should be followed to supplement standards that are not provided by the GoV.

161. After construction is completed the potential impacts of the operation of the new Phu Nghia 110 kV substation and transmission line will be monitored by EVNHANOI.

C. Performance Monitoring

162. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 34.

Table 33. Environmental Monitoring Plan

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	**Location**	**Means of Monitoring**	**Frequency**	**Reporting**	**Responsibility**		**Estimated Cost (USD)**
					Supervision	**Implementation**	
Pre-construction Phase – Update Baseline Conditions							
A) Air quality and microclimate: dust, CO, NOx, SO2, -Noise B) Affected surface water quality: TSS, oil and grease, BOD_5, , TDS, TP, TN	At SS site and TL	Using field and analytical methods approved by DoNRE.	One measurement	One baseline supplement report before construction phase starts	PIC/ESU	Environmental Monitoring Consultant	A)$1,000 B)$1,000.
Construction Phase of Phu Nghia 110 kV Substation and transmission line							
A) Air quality and microclimate: dust, CO, NOx, SO2, - Noise B) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps.TSS, oil and grease, BOD5, , TDS, TP, TN C) Public comments and complaints	A): Baseline sites of pre-construction phase. B) All construction sites and worker camps C) Using hotline number placed at construction areas D) At all	A) Using field and analytical methods approved by DoNRE. Include visual observations of dust and noise from contractor and public reports. B) Visual observation C) Information transferred by telephone hotline number posted at all construction sites. D) regular reporting by contractors/ESU	(A): Quarterly during construction periods Daily visual records B) Monthly C) Continuous public input D) Continuous	Monthly	(A - B):		
					ESU	Monitoring Consultant	A and B: $1000/yr D: no marginal cost
					(C and D) and daily observations:		
					EA/ESU	contractor	E- F: no marginal

D) Incidence of worker or public accident or injury	construction areas						cost
Operation of Phu Nghia110 kV Substation and transmission line							
Incidence of worker accidents, or spills on hazardous materials, noise and EMF	At substation	Regular documentation and reporting	Continuous		EVNHANOI /PPMB		O and M

Table 34.Performance Monitoring Indicators for Subproject

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Detailed designs, bidding document establishment, the project approval and submission	Mentioned in Table 31	Design documents Local GOV's letters for agreement of TL alternative Requirements of EMP (SEMP)	All mitigation measures are considered during detailed designs All stakeholders contacted during IEE re-contacted for follow-up consultation EMP appended to bidding documents with clear instructions to bidders for SEMP	Design documents EMP Bid documents
Land acquisition and compensation	Mentioned in Table 31	Mentioned in RP	Mentioned in RP	Resettlement Plan
UXO	Mentioned in table 31	UXO disarmament	No risk of life safety of workers and people	Monitoring by PIC/PMB
Training of PMB/EO		Training course(s) and schedule	By end of pre-construction phase, required course(s) that will be delivered are designed and scheduled	Course(s) outline, participants, and schedule
Construction site arrangement	Mentioned in Table 31	- License of disposal - Transportation plan - location of temporary area for stock pile and material gathering - License for safety and	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/PMB

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
		environment ensure of vehicles/machines		
Construction Phase				
Tree cutting and site clearance	Mentioned in Table 31	- Important habitat, rare or endangered species if presenting during tree cutting and site clearance - Fire protection at section crossing forest - Implementation of reforestation	All *present* critical habitat and rare and endangered species if unchanged, and unharmed - Prevent forest fire - Forest coverage	Monitoring by EMC
Concentration of workers and domestic wastes generated	Mentioned in Table 31	Hygiene situation, availability of toilet and waste basket Residential register of workers Rainwater drainage system in worker camps Food safety regulations Educating and training about health and hygiene for workers	Rigorous program of procedures to manage worker's camp	EMC and contractor monitoring reports
Refused rock and soil, debrides, other hazardous wastes generated by rock and soil filling and excavation for tower foundation pits, cable trenches, tower installation, and equipment, devices, machines and transportation means	Mentioned in Table 31	Solid waste and liquid waste treatment system Hazardous waste: Oil, gasoline, grease collection and treatment license	- Rigorous program of procedures to manage and store all waste from construction camps and sites practiced, and manage earthworks. - Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	EMC and contractor monitoring reports,
Noise, dust and exhausts due to construction activities and transportation of materials	Mentioned in Table 31	dust, CO, NO_x, SO_2, noise levels meet Vietnamese standards	The content must not exceed the level at pre-subproject. Complying with mitigation measures for water quality Mentioned in Table 31	EMC and monitoring report of contractors
Construction materials transportation, and storage	Mentioned in Table 31	Frequency of disruptions and blocked roadways is reduced Maintenance and operation method of equipment, machines, and vehicles	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
Power supply and other utilities due to	Mentioned in	Timing of power cut	Minimized time of power cut, effect on	EMC and monitoring

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
wire pull and scatter, and the TL connection to the national grid system	Table 31	Methods of pulling wire at section crossing over existing TLs Methods of constructing underground cable	existing Tls and underground works.	report of contractors
Soil erosion	Mentioned in Table 31	Earth dyke, Embankment were built; vegetation are grown on bare land	Land quality and minimize land slide or erosion	EMC and monitoring report of contractors
Community and worker safety	Mentioned in Table 31	Frequency of injuries are reduced	Adherence to GoV occupational health and Safety regulations	Contractor reports
Construct drainage system of rainwater, water pumped from the foundation pits	Mentioned in Table 31	TSS, oil and grease, BOD_5, , TDS, levels meet Vietnamese standards	GoV environmental standards and criteria met Complying with mitigation measures for water quality Mentioned in Table 29	Monitoring by EMC
Detect cultural and historical properties or values	Mentioned in Table 31	Cultural and historical properties are conserved	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, contractor reports, public input, EMC reports
Repair, restore, return the ground after construction completion	Mentioned in Table 31	Remain construction material at the site are collected Construction solid waste; un-clearance of worker camp etc. are cleaned.	Recovery of construction site; remove construction solid waste; clean worker camp etc.	Site observation; Contractor and EMC monitoring reports
Operation phase of SS and transmission line				
Worker and community Safety	Mentioned in Table 31	Frequency of accidents, and spills is reduced Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHANOI
Clearance of trees and branches violating the ROW	Mentioned in Table 31	Clearance of trees and branches follow regulations	In compliance to GoV regulations on noise, EMF and fire prevention	EVNHANOI

D. Reporting

163. 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 and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. The mitigation and monitoring plans (Tables 31 and 33) summarize proposed timing of reporting which is on monthly basis.

164. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/ESU. The IA report will compile monthly reports provided by the EO of contractor, the reports of the EMC on monitoring, and input from the ES of the PIC. The IA/ESU report will also be sent to the DoNRE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 34), and will include relevant GoV environmental quality standards.

IX. ESTIMATED COST OF EMP

165. The marginal costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included with the construction costs in contractor bid documents. From Table 22 the preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for EVNHANOI/PPBM is approximately USD $9,000.00 which is summarized in Table 35.

Table 35. Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre-construction Phase	
Environmental quality	$2,000.00
Construction Phase	
Environmental quality	$1,000.00
Operation Phase	
Environmental quality	no cost
Public input	no cost
Training and capacity development of EVNHANOI/PPBM/ESU	$6,000.00
Total	**$9,000.00**

166. The environmental costs are for field sampling and laboratory analyses which include professional per diems of technicians.

167. An estimated budget of USD $6,000.00 is required for training of the EA/IA/ESU on environmental assessment and management, and the implementation of the EMP. The estimated costs of the EMP and training will need to be updated by the PIC in conjunction with the IA/ESU during the pre-construction phase.

IX. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Public Consultation

168. The stakeholder consultation strategy 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.

1. Identification of Stakeholders

169. 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)Communal People's Committee, People's Commission,(ii)Project EA,(iii)PMU;
  - Organizations/unions/associations such as Women Union and Farmers Union which provided various information for the design of the subproject, and which might participate in implementation of measures and interventions;
  - Households and enterprises living along the transmission line can be people who will be directly affected or be adversely impacted or can be people who will be received benefits from the determination and implementation of mitigation measures against adverse impacts, and
  - Organizations, individuals affected by the subproject.

Formal community consultation meetings were held to discuss the location and potential environmental and social impact of the substation. Six public consultations were held in 06 communes; details of meetings are presented in Table 36. In Dong Yen Commune, no households joined the meeting because the 800m section of the transmission line crosses over public land which is planned for communal grave yard.

Table 35. Time and venue of public consultation meetings

No	Commune	Time	Venue	No.of participants
1	Dong Son	Morning 30/06/2015	CPC Office	4
2	Phu Nghia	Afternoon 30/06/2015	CPC Office	13
3	Dong Phuong Yen	Morning01/07/2015	CPC Office	5
4	Can Huu	Morning 03/07/2015	CPC Office	13
5	Hoa Thach	Morning10/07/2015	CPC Office	7
6	Dong Yen	Afternoon 10/07/2015	CPC Office	0

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

i. Engineering consultant introduced the subproject "Phu Nghia SS and Phu Nghia-Xuan Mai transmission line" 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;

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 commune/ward leaders, the representatives of Vietnamese Fatherland Front of the locality and the affected organizations/unions.

2. **Results of Public Consultation**

171. 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.
- Recheck the location of the transmission line and the position of each tower foundation to minimize the impact on people's land and property, specifically tower foundations no. 23, 34, 35 in Dong Yen commune;
- The Contractor should take required measures to rehabilitate the area, ensuring the re-cultivation, while avoiding conflicts and grievances as many as possible.
- It is recommend focusing on safety measures during the operation of the transmission line, to ensure the safety conditions, health for working farmers in the field and avoid any incidents.

172. The summary of comments/questions from local authorities/people and answers of project owners and consultants are summarized in Table 37. Required input from stakeholders and response from project owners will occur through the Grievance Redress Mechanism

Table 36. Discussion summary of public consultation

No	Comments	Response of consultant	Response from Project Owner
I	**Dong Son Commune**		
1	Concerns on working beneath the high voltage transmission line	Contractor will take measures as outlined to mitigate impacts. In case of any incident affecting people's equipment and structures the Contractor will have the timely corrective plan, as prescribed by law.	Mitigation measures are presented in Section IX. Environmental Management Plan
II	**Phu Nghia Commune**		
2	Minimize impacts on farming land by reviewing construction sites. Safety during operation of transmission line	Noted. The design, construction and operation of the TL is subject to safety regulations to avoid potential risks	Mitigation measures are presented in Section VII. Potential Impacts and Mitigation Measures Section IX. Environmental Management Plan
III	**Dong Phuong Yen Commune**		
3	Strictly supervise the Contractor to avoid	Role and responsibilities of the Contractor were made clear in	Mitigation measures are presented in Section VII.

	damages to people	the meeting. The Project Owner and the Contractor will have commitments which are subject to community's supervision	Potential Impacts and Mitigation Measures
4	Safety measures should be well taken during operation of the TL	Contractor will be committed to properly implement measures as outlined to minimize the impacts. In the event of a malfunction in the line, affecting the equipment, infrastructure and people's health, the investor will be liable under the law.	Mitigation measures are presented in Section VII. Potential Impacts and Mitigation Measures
IV	**Can Huu commune**		
5	Agree with the project. After completion of the project, rehabilitation of the area should be made in due time so that farmers can resume farming	Noted. The Contractor will be solely responsible for this. Also, stakeholders are suggested to maintain supervision of construction, community supervision as well their role in ensuring the rehabilitation	Mitigation measures are presented in Section VII. Potential Impacts and Mitigation Measures
V	**Hoa Thach Commune**		
6	Though insignificant impacts in this commune, the Contractor is recommended to take all measures as proposed to protect local environment	The Project Owner and Contractor are committed to take necessary measures during construction phase. Also it is recommended that community supervision should be advocated for best effectiveness.	Mitigation measures are presented in Section VII. Potential Impacts and Mitigation Measures
7	Communal staff should be involved in the project implementation to ensure people's interest and prevent possible conflicts between local people and workers.	Noted. Cooperation between project side and local authority will be maintained at all project phases from designing to operation.	Section IX. Environnemental Management Plan

173. In short, the local people agree with the implementation of the subproject; 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.

174. Before commencing the construction, the project owner shall notify the CPCs on the progress of construction, publicize approved IEE, EMP and EIA in Vietnamese in CPC offices. Subsequent public consultation meetings are not required any further.

B. Information disclosure

175. Formal information disclosure to the affected persons and stakeholders of " 110 kV Phu Nghia SS and transmission line" subproject that presented in the IEE aims to the beginning of continued information disclosure and participation of relevant parties as the subproject is implemented. As part of the communication strategy for the relevant parties (stakeholders), regular information exchange meetings with stakeholders are strongly encouraged throughout the implementation of the subproject.

176. 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 should be available on the EVNHN website, at the EVNHN 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 should 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.

XI. EMERGENCY RESPONSE PLAN

177. The Contractor must develop emergency or incident response procedures during construction and operation phases of the new Phu Nghia 110 kV Substation and 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 D.

XII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

178. 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 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 should be included with costs for implementation of the EMP.

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

XIII. CONCLUSIONS AND RECOMMENDATION

180. The initial examination of Phu Nghia 110 kV substation and transmission line in Ha Noi indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

181. The civil construction impacts of elevated dust, noise, traffic disruptions and sedimentation, and public and worker safety are assessed as medium and can be managed effectively with standard construction practices.

182. 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; rehabilitation of the area should be made in due time so that farmers can resume farming . The safe operation of the substation and transmission line were significantly focused by local residents.

183. 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 (EIA) of the subproject is not required.

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APPENDICES

A. Rapid Environmental Assessment (REA) Checklist

B. Minutes of Public Consultation Meetings, Ha Noi

C. Emergency Response Plan

D. DECISION OF MINISTRY OF DEFENCE REGARDING UXO CLEARANCE

Appendix A : Rapid Environmental Assessment (REA) Checklist

Instructions:

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

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

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

Country/Project Title **Ha Noi and Ho Chi Minh City Power Grid Development Sector Project LOANS 3161/8286-VIE**

Sector Division: **Phu Nghia 110kV substation and 110 kVTransmission line**

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

Screening Questions	Yes	No	Remarks
▪ Encroachment on precious ecosystem (e.g. sensitive or protected areas)?		x	
▪ 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 submarine cables?		x	There are no submarine cables to be installed by the project.
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		x	Low impact level during construction phase. 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 as this is rural area and transmission line does not traverse urban area. 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 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		Small impact. Potential local social issues with construction worker population are identified in the IEE and are addressed by the Mitigation Plan of IEE.
▪ 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 transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	x		Low risk level. 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 areais located in an elevated area which is 0.4m higher than ground and the risk of flooding is minimal. The transmission line construction will be affected by temporary flooding. No impact in operation of TL.
▪ 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

Table 1The summary of public consultation meeting and number of participants

No	Name ofsubprojects	Location	Date	Participants*		
				Male	Female	Total
	Phu Nghia 110kV SS and TL	Hoa Thach Commune, Quoc Oai District	Morning 10/07/2015	15	5	20
		Can Huu Commune, Quoc Oai	Morning 03/07/2015	10	6	16
		Dong Yen Commune, Quoc Oai District	Afternoon 10/07/2015	11	9	20
		Dong Son, Chuong My District	Morning 30/06/2015	12	4	16
		Dong Phuong Yen, Chuong My District	Morning 01/07/2015	9	3	12
		Phu Nghia Commune, Chuong My District	Afternoon 30/06/2015	13	6	19
			Total	**70**	**33**	**103**

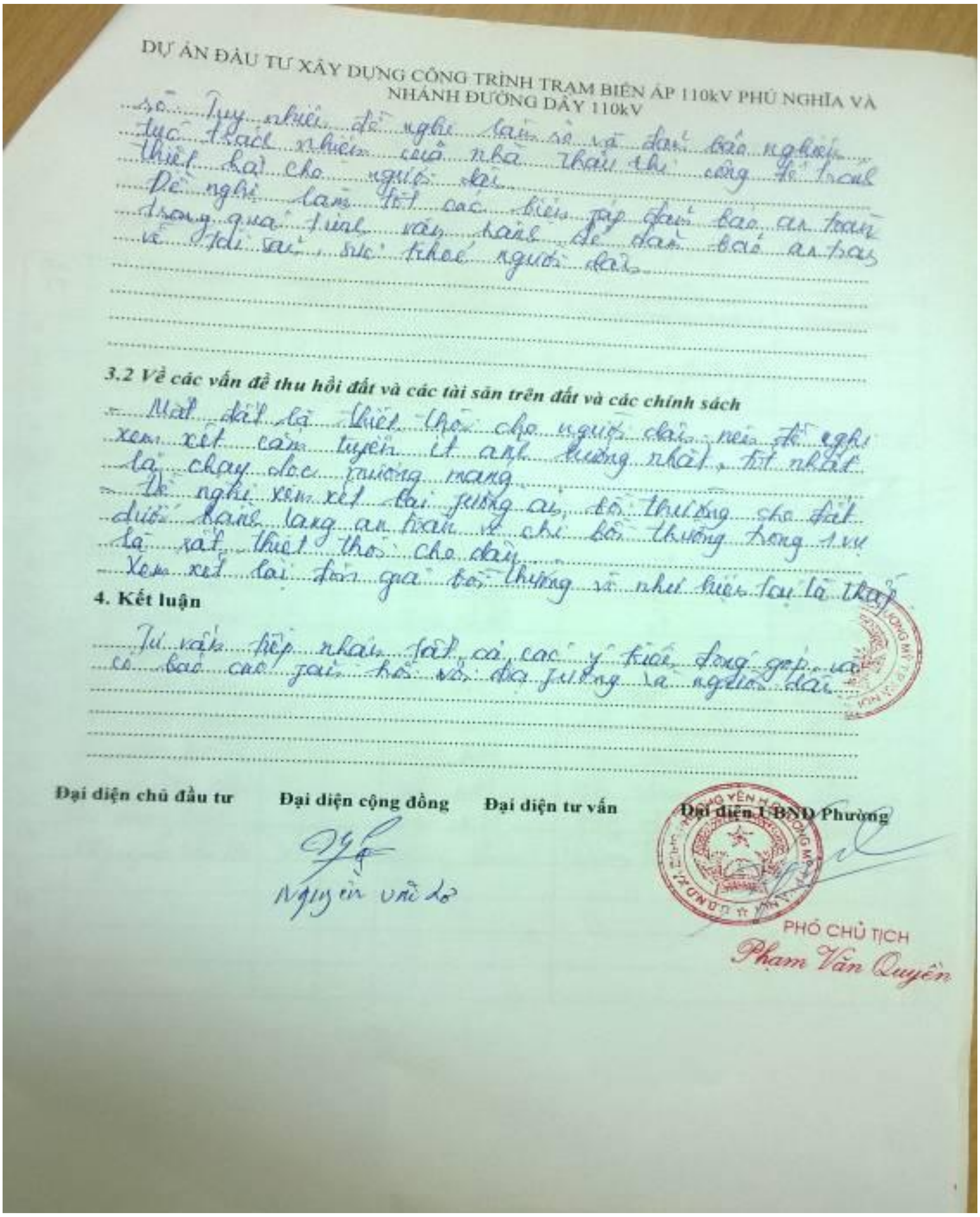
a. List of participants

No	Name	Sex		Location/Position
		Male	Female	
I	**Hoa Thach Comm., Quoc Oai Dist.**			
1	Do Truong Cong	X		CPC Vice Chairman
2	Bui Thanh Hung	X		Land administration staff
3	Phung Van Thinh	X		Communal Party Secretary
4	Kieu Van Chinh	X		Bach Thach Hamlet
5	Nguyen Van Hai	X		Bach Thach Hamlet
6	Nguyen Manh Hung	X		Hoa Thach Commune
7	Nguyen Ha Trang		X	Bach Thach Hamlet
8	Nguyen Thi Lan		X	Bach Thach Hamlet
9	Nguyen Van Nhat	X		Bach Thach Hamlet
10	Nguyen Xuan Truong	X		Bach Thach Hamlet
11	Nguyen Van Bao	X		Bach Thach Hamlet
12	Do Van Tinh	X		Bach Thach Hamlet
13	Nguyen Van Tang	X		Bach Thach Hamlet
14	Truong Thi Mai		X	Bach Thach Hamlet
15	Bui Thanh Hung	X		Bach Thach Hamlet
16	Nguyen Hong Thuan	X		Bach Thach Hamlet
17	Nguyen Thanh Chuan	X		Bach Thach Hamlet
18	Nguyen Thi Men		X	Bach Thach Hamlet
19	Nguyen Van The	X		Bach Thach Hamlet
20	Nguyen Thi Hao		X	Bach Thach Hamlet
II	**Can Huu Comm. Quoc Oai Dist.**			
21	Bui Thi Le		X	Dinh Tu Hamlet
22	Hoang Van Tien	X		Dinh Tu Hamlet
23	Can Thi Lu		X	Can Thuong Hamlet
24	Can Thi Truc		X	Can Thuong Hamlet
25	Le Dinh Ty	X		Can Thuong Hamlet
26	Can Van Ngan	X		Can Thuong Hamlet
27	Nguyen Van Mai	X		Can Thuong Hamlet
28	Nguyen Van Van	X		Can Ha Hamlet
29	Nguyen Thi Khanh		X	Can Ha Hamlet
30	Bui Van Hong	X		Can Ha Hamlet
31	Nguyen Van Thuan	X		Can Ha Hamlet
32	Can Thi Hoi		X	Can Ha Hamlet
33	Bui Thi Vui		X	Can Ha Hamlet
34	Nguyen Dac Tuy	X		CPC Vice Chairman
35	Bui Van Bien	X		Land Admin.staff
36	Nguyen Xuan Long	X		Communal Fatherland Front Chairman
III	**Dong Yen Comm.Quoc Oai Dist.**			
37	Tran Anh Dang	X		CPC Vice Chairman

38	Nguyen Manh Tan	X		Dong Yen Commune
39	Can Van Tiem	X		Dong Yen Commune
40	Ta Dinh Quy	X		Dong Yen Commune
41	Kieu Cong Khich	X		Dong Yen Commune
42	Ta Thi Thieu		X	Dong Yen Commune
43	Hoang Van Tiem	X		Dong Yen Commune
44	Can Van Quan	X		Dong Yen Commune
45	Do Van Thao	X		Dong Yen Commune
46	Nguyen Van Sy	X		Dong Yen Commune
47	Nguyen Thi Liem		X	Dong Yen Commune
48	Cao Thi Ba		X	Dong Yen Commune
49	To Thi Bich		X	Dong Yen Commune
50	Kieu Thi Thao		X	Dong Yen Commune
51	Ha Thi Thuy		X	Dong Yen Commune
52	Do Thi Hoa		X	Dong Yen Commune
53	Doi Thi Hue		X	Dong Yen Commune
54	Nguyen Van Chien	X		Dong Yen Commune
55	Bui Minh Ngoc	X		Dong Yen Commune
56	Le Thi Viet		X	Dong Yen Commune
IV	**Dong Son Comm.Chuong My Dist.**			
57	Nguyen Van Diep	X		An Son Hamlet
58	Can Van Loc	X		An Son Hamlet
59	Do Thi Trinh		X	Luong Son Hamlet
60	Nguyen Van Lanh	X		Luong Son Hamlet
61	Nguyen Thi Hien		X	Luong Son Hamlet
62	Chu Van Ky	X		Dong Son Commune
63	Tran Van Binh	X		Dong Son Commune
64	CaoThi Dieu		X	Dong Son Commune
65	Nguyen Xuan Son	X		Dong Son Commune
66	Nguyen Dinh Cat	X		Dong Son Commune
67	Tran Thi Mien		X	Dong Son Commune
68	Nguyen Van Son	X		Dong Son Commune
69	Hoang Van Thi	X		Communal Party Secretary
70	Trinh Xuan Ben	X		CPC Vice Chairman
71	Nguyen Dac Dam	X		Land Admin. Staff
72	Trinh Van Huong	X		Communal Commission Chairman
V	**Dong Phuong Yen Comm. Chuong My Dist.**			
73	Nguyen Van Tang	X		Communal Party Secretary
74	Pham Van Quyen	X		CPC Vice Chairman
75	Tran Van Tien	X		CPC Chairman
76	Tran Thi Oanh		X	Dong Phuong Yen Commune
77	Nguyen Gia Tu	X		Communal Commision Chairman
78	Nguyen Van Thao	X		Land Admin.staff
79	Do Van Hanh	X		Dong Cuu Hamlet
80	Do Le Binh	X		Dong Cuu Hamlet

81	Nguyen Van Su	X		Yen Kien Hamlet
82	Nguyen Thi Xe		X	Yen Kien Hamlet
83	Do Thi Binh		X	Yen Kien Hamlet
84	Do Van Chu	X		Yen Kien Hamlet
VI	**Phu Nghia Comm. Chuong My Dist.**			
85	Hoang Van Uyen	X		Communal Party Secretary
86	Nguyen Van Doanh	X		CPC Chairman
87	Tran Ba Ve	X		CPC Vice Chairman
88	Tran Van Thuong	X		Communal Fatherland Front Chairman
89	Nguyen Duong Ly	X		Land Admin. Staff
90	Nguyen Van Vinh	X		Phu Vinh Hamlet
91	Nguyen Thi Tam		X	Phu Vinh Hamlet
92	Tran Van Khoa	X		Phu Vinh Hamlet
93	Tran Thi Dao		X	Phu Vinh Hamlet
94	Nguyen Thi Huong		X	Phu Huu Hamlet
95	Vuong Van Binh	X		Khe Than Hamlet
96	Nguyen Dinh Bon	X		Khe Than Hamlet
97	Do Thi To		X	Quan Cham Hamlet
98	Nguyen Van Khoa	X		Quan Cham Hamlet
99	Hoang Thi An		X	Nghia Hao Hamlet
100	Nguyen Dinh Tuong	X		Nghia Hao Hamlet
101	Nguyen Thi Tang		X	Dong Tru Hamlet
102	Nguyễn Ngọc Thanh	X		Dong Tru Hamlet
103	Nguyễn Ngọc Lô	X		Dong Tru Hamlet

b. Scanned copies of minutes and list of participants



DỰ ÁN ĐẦU TƯ XÂY DỰNG CÔNG TRÌNH TRẠM BIẾN ÁP 110kV PHÚ NGHĨA VÀ NHÁNH ĐƯỜNG DÂY 110kV

số. Tuy nhiên đề nghị làm rõ và đảm bảo nghiêm túc trách nhiệm của nhà thầu thi công để tránh thiệt hại cho người dân.
Đề nghị làm tốt các biện pháp đảm bảo an toàn trong quá trình vận hành để đảm bảo an toàn về đời sống, sức khỏe người dân.

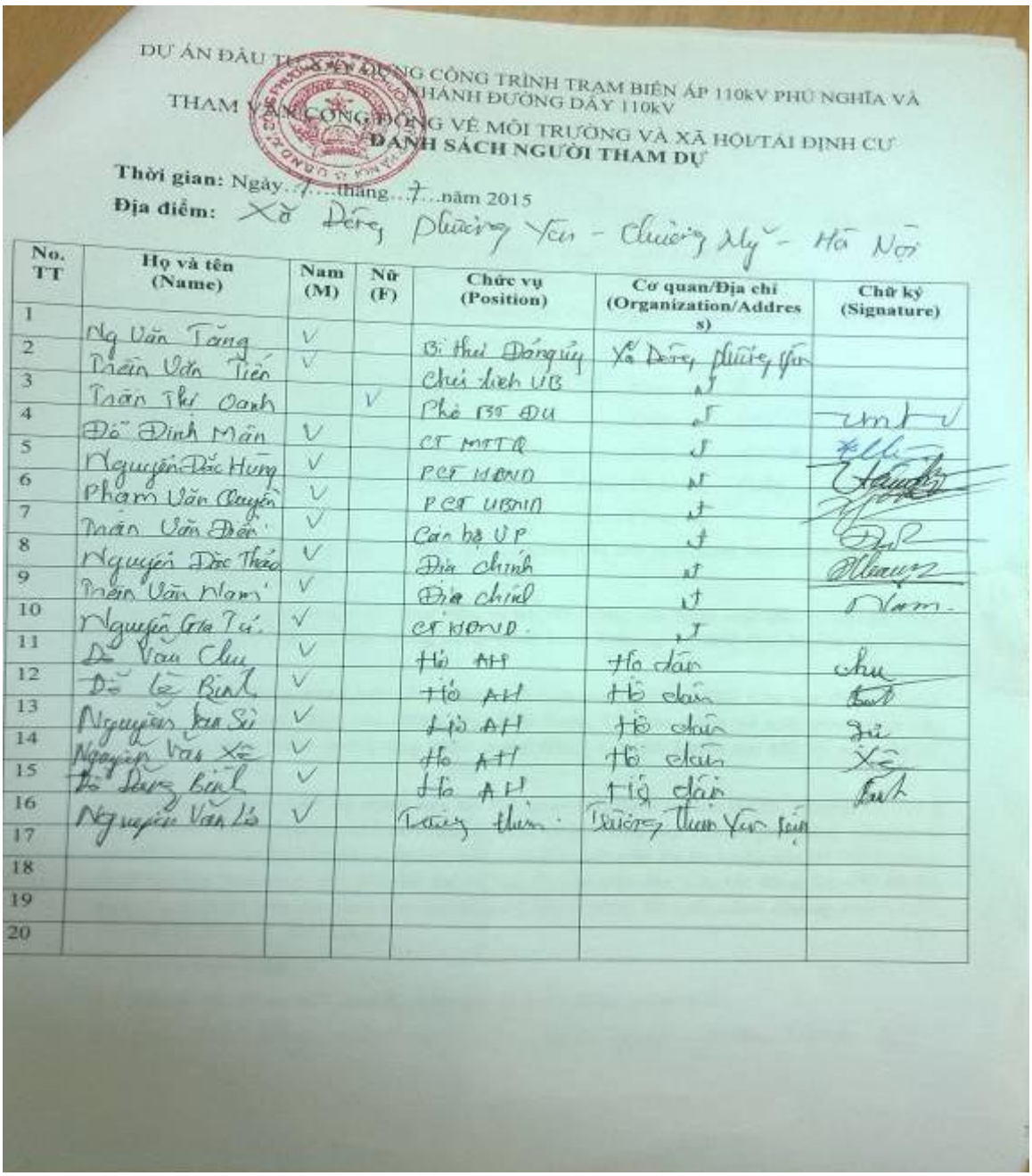
3.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

– Mất đất là thiệt thòi cho người dân nên đề nghị xem xét cắm tuyến ít ảnh hưởng nhất, tốt nhất là chạy dọc mương máng.
– Đề nghị xem xét lại phương án bồi thường cho đất dưới hành lang an toàn vì chỉ bồi thường trong 1 vụ là rất thiệt thòi cho dân.
– Xem xét lại đơn giá bồi thường vì như hiện tại là thấp.

4. Kết luận

Tư vấn tiếp nhận tất cả các ý kiến đóng góp và có báo cáo tại hồ sơ địa phương và người dân.

Đại diện chủ đầu tư	**Đại diện cộng đồng**	**Đại diện tư vấn**	**Đại diện UBND Phường**
	Nguyễn Văn Độ		PHÓ CHỦ TỊCH Phạm Văn Quyền



DỰ ÁN ĐẦU TƯ XÂY DỰNG CÔNG TRÌNH TRẠM BIẾN ÁP 110kV PHÙ NGHĨA VÀ ĐẤU NỐI HOÀN THIỆN ĐƯỜNG DÂY 110kV

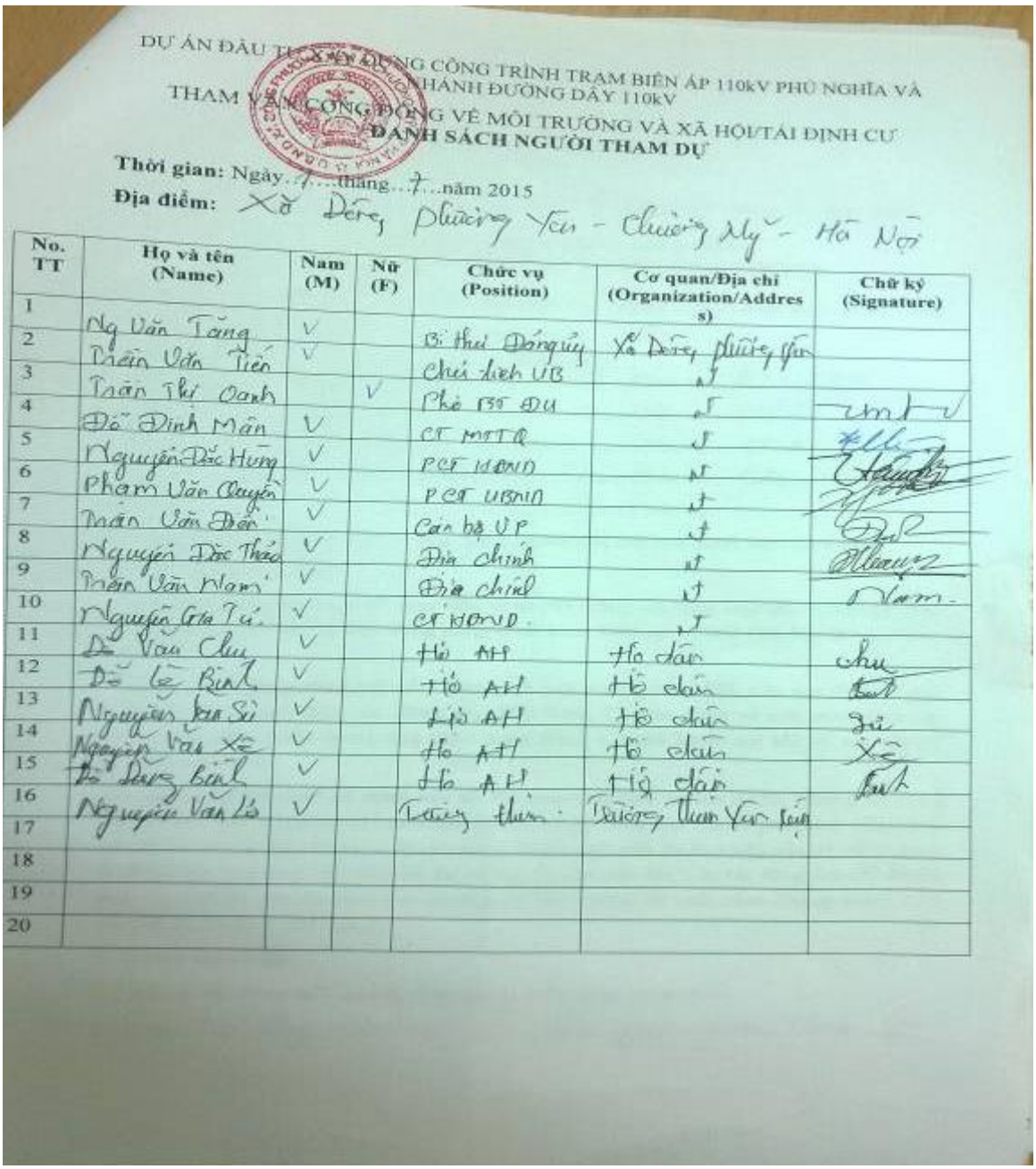
THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG VÀ XÃ HỘI/TÁI ĐỊNH CƯ

DANH SÁCH NGƯỜI THAM DỰ

Thời gian: Ngày 7 tháng 7 năm 2015

Địa điểm: Xã Dếng, Phường Yên - Chương Mỹ - Hà Nội

No. TT	Họ và tên (Name)	Nam (M)	Nữ (F)	Chức vụ (Position)	Cơ quan/Địa chỉ (Organization/Address)	Chữ ký (Signature)
1						
2	Ng Văn Tăng	V		Bí thư Đảng ủy	Xã Dếng, phường Yên	
3	Phan Văn Tiến	V		Chủ tịch UB	"	
4	Trần Thị Oanh		V	Phó BT ĐU	"	
5	Đỗ Đình Mãn	V		CT MTTQ	"	
6	Nguyễn Đức Hùng	V		PCT HĐND	"	
7	Phạm Văn Quyền	V		PCT UBND	"	
8	Trần Văn Đến	V		Cán bộ VP	"	
9	Nguyễn Đức Thảo	V		Địa chính	"	
10	Phan Văn Nam	V		Địa chính	"	
11	Nguyễn Gia Tú	V		CT HĐND	"	
12	Đỗ Văn Chu	V		Hộ AH	Hộ dân	
13	Đỗ Lê Bình	V		Hộ AH	Hộ dân	
14	Nguyễn Văn Sĩ	V		Hộ AH	Hộ dân	
15	Nguyễn Văn Xê	V		Hộ AH	Hộ dân	
16	Đỗ Đăng Bình	V		Hộ AH	Hộ dân	
17	Nguyễn Văn Lô	V		Trưởng thôn	Trưởng thôn Yên Sơn	
18						
19						
20						



DỰ ÁN ĐẦU TƯ XÂY DỰNG CÔNG TRÌNH TRẠM BIẾN ÁP 110kV PHÙ NGHĨA VÀ ĐƯỜNG DÂY 110kV

THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG VÀ XÃ HỘI/TÁI ĐỊNH CƯ

DANH SÁCH NGƯỜI THAM DỰ

Thời gian: Ngày 1 tháng 7 năm 2015

Địa điểm: Xã Đồng Phương Yên - Chương Mỹ - Hà Nội

No. TT	Họ và tên (Name)	Nam (M)	Nữ (F)	Chức vụ (Position)	Cơ quan/Địa chỉ (Organization/Address)	Chữ ký (Signature)
1	Ng Văn Tăng	V		Bí thư Đảng ủy	Xã Đồng Phương Yên	
2	Trần Văn Tiến	V		Chủ tịch UB	"	
3	Trần Thị Oanh		V	Phó CT UB	"	
4	Đỗ Đình Mân	V		CT MTTQ	"	
5	Nguyễn Đức Hưng	V		PCT HĐND	"	
6	Phạm Văn Quyền	V		PCT UBND	"	
7	Trần Văn Đắc	V		Cán bộ VP	"	
8	Nguyễn Đức Thắng	V		Địa chính	"	
9	Trần Văn Nam	V		Địa chính	"	
10	Nguyễn Gia Tú	V		CT HĐND	"	
11	Đỗ Văn Chu	V		Hộ AH	Hộ dân	
12	Đỗ Lê Bình	V		Hộ AH	Hộ dân	
13	Nguyễn Văn Sĩ	V		Hộ AH	Hộ dân	
14	Nguyễn Văn Xê	V		Hộ AH	Hộ dân	
15	Đỗ Đăng Bình	V		Hộ AH	Hộ dân	
16	Nguyễn Văn Lô	V		Trưởng thôn	Trưởng Thôn Yên Sơn	
17						
18						
19						
20						

các biện pháp giảm thiểu, quản lý để không ảnh hưởng đời sống kinh tế của địa phương;
- Đề nghị trong quá trình thực hiện dự án phải có sự tham gia của cán bộ xã để trực tiếp phụ trách và xử lý các vấn đề phát sinh như: thi công bừa bãi, sai ngoài diện tích thu hồi, ... tránh xa rất quá dài ảnh hưởng thầu

3.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Đề nghị xã phải có cán bộ tham gia, đại diện cho dân
- Đề nghị làm rõ các vị trí, diện tích thu hồi của từng hộ,
- Tư vấn cần tính toán chi tiết và chính xác các diện tích ảnh hưởng, ngoài nhằm giảm tối thiểu các việc phát sinh.
- Đề nghị lựa chọn thời điểm thi công tránh thời điểm mùa vụ, tránh mùa vụ cũng như phát sinh khiếu nại.

4. Kết luận

Tư vấn ghi nhận tất cả các ý kiến và phản ánh lại các bên liên quan.

Đại diện chủ đầu tư	Đại diện cộng đồng	Đại diện tư vấn	Đại diện UBND Phường /xã
	Nguyễn Mạnh Hùng		PHÓ CHỦ TỊCH Đỗ Trường Công

các biện pháp giảm thiểu, quản lý để không ảnh hưởng đến đời sống kinh tế của địa phương.

- Đề nghị trong quá trình thực hiện dự án phải có sự tham gia của cán bộ xã để trực tiếp phụ trách và xử lý các vấn đề phát sinh như: thi công bừa bãi sai ngoài diện tích thu hồi, ... tránh xe xúc quá dài ảnh hưởng nhà thầu

3.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Đề nghị xã phải có cán bộ tham gia, đại diện cho dân
- Đề nghị làm rõ các vị trí, diện tích thu hồi của từng hộ
- Tư vấn cần tính toán chi tiết & chính xác các diện tích ảnh hưởng, nguyên nhân giảm tối thiểu các việc phát sinh.
- Đề nghị lựa chọn thời điểm thi công tránh thời điểm mùa vụ, tránh mùa vụ cũng như phát sinh khiếu nại.

4. Kết luận

Tư vấn ghi nhận tất cả các ý kiến và phản ánh lại các bên liên quan

Đại diện chủ đầu tư	Đại diện cộng đồng	Đại diện tư vấn	Đại diện UBND Phường /xã
	Nguyễn Mạnh Hùng		PHÓ CHỦ TỊCH Đỗ Trường Công

các biện pháp giảm thiểu, quản lý để không ảnh hưởng đến đời sống kinh tế của địa phương.
- Đề nghị trong quá trình thực hiện dự án phải có sự tham gia của cán bộ xã để trực tiếp phụ trách và xử lý các vấn đề phát sinh như: thi công bừa bãi, sai ngoài diện tích thu hồi, tránh xe xảy quá dài của nhà thầu

3.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Đề nghị xã phải có cán bộ tham gia, đại diện cho dân
- Đề nghị làm rõ các vị trí, diện tích thu hồi của từng hộ.
- Tư vấn cần tính toán chi tiết, chính xác các diện tích ảnh hưởng, ngày nhận giải tỏa, tối thiểu các việc phát sinh.
- Đề nghị lựa chọn thời điểm thi công tránh thời điểm mùa vụ, tránh mùa vụ cũng như phát sinh khiếu nại.

4. Kết luận

Tư vấn ghi nhận tất cả các ý kiến và phản ánh lại các bên liên quan.

Đại diện chủ đầu tư	Đại diện cộng đồng	Đại diện tư vấn	Đại diện UBND Phường /xã
	Nguyễn Mạnh Hùng		PHÓ CHỦ TỊCH Đỗ Trường Công

các biện pháp giảm thiểu, quản lý để không ảnh hưởng đến đời sống kinh tế của địa phương.

- Đề nghị trong quá trình thực hiện dự án phải có sự tham gia của cán bộ xã để trực tiếp phụ trách và xử lý các vấn đề phát sinh như: thi công bừa bãi, sai ngoài diện tích thu hồi, thời gian xây dựng quá dài của nhà thầu

3.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Đề nghị xã phải có cán bộ tham gia, đại diện cho dân
- Đề nghị làm rõ các vị trí, diện tích thu hồi của từng hộ
- Tư vấn cần tính toán chi tiết và chính xác các diện tích ảnh hưởng, nhằm giảm tối thiểu các việc phát sinh.
- Đề nghị lựa chọn thời điểm thi công tránh thời điểm mùa vụ, tránh mùa vụ cũng như phát sinh khiếu nại.

4. Kết luận

Tư vấn ghi nhận tất cả các ý kiến và phản ánh lại các bên liên quan.

Đại diện chủ đầu tư	Đại diện cộng đồng	Đại diện tư vấn	Đại diện UBND Phường/xã
	Nguyễn Mạnh Hùng		PHÓ CHỦ TỊCH Đỗ Trường Công

các biện pháp giảm thiểu, quản lý để không ảnh hưởng đến đời sống, điều kiện của địa phương.

- Đề nghị trong quá trình thực hiện dự án phải có sự tham gia của cán bộ xã để trực tiếp phụ trách và xử lý các vấn đề phát sinh như: thi công bừa bãi, xả ngoài diện tích thu hồi, ... tránh xô xát giữa dân & nhà thầu.

3.2 *Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách*

- Đề nghị xã phải có cán bộ tham gia, đại diện cho dân
- Đề nghị làm rõ các vị trí, diện tích thu hồi của từng hộ.
- Tư vấn cần tính toán chi tiết & chính xác các diện tích ảnh hưởng, nhằm giảm tối thiểu các việc phát sinh.
- Đề nghị lựa chọn thời điểm thi công tránh thời điểm mùa vụ, tránh mùa vụ cũng như phát sinh khiếu nại.

4. Kết luận

Tư vấn ghi nhận tất cả các ý kiến và phản ánh lại các bên liên quan.

Đại diện chủ đầu tư	Đại diện cộng đồng	Đại diện tư vấn	Đại diện UBND Phường/xã
	Nguyễn Mạnh Hùng		PHÓ CHỦ TỊCH Đỗ Trường Công


ĐẢNG CỘNG SẢN VIỆT NAM

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 should ensure:

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

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

Table 1: Roles and Responsibilities in Emergency Incident Response

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

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

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

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

i) Subproject sites;

ii) construction time frame and phasing;

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

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

v) the Contractor's Emergency Management Plan

vi) names and contact details of the ERT members

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

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

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

iii) the arrangements for coordination and collaboration.

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

i) set up the CERT;

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

iii) made arrangements with the EERT;

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

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

vi) conduct drills for different possible situations.

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

Alert Procedures

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

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

- call the attention of other people in the emergency site,
- sound the nearest alarm, and/or
- report/communicate the emergency situation to the CERT

(ii) Only the ERTL and, if ERTL is not available, the Deputy ERTL are authorized to communicate with the EERT. Exceptional cases to this rule may be necessary and should 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 names and contact details of the relevant persons and institutions should 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 should 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 should 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 everyone 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.
If injury warrants special care, DO NOT MOVE them, unless necessary and instructed/directed by the EERT	ERTL/Deputy ERTL communicates with EERT to get instructions/directions in handling the injured.

Table 3: 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: - victim is 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	Whoever 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 nearest 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

APPENDIX D. DECISION OF MINISTRY OF DEFENCE REGARDING UXO CLEARANCE

BỘ QUỐC PHÒNG
BỘ TƯ LỆNH THỦ ĐÔ HÀ NỘI

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

Số: 1095/ QĐ-BTL

Hà Nội, ngày 16 tháng 6 năm 2015

QUYẾT ĐỊNH

V/v tổ chức thực hiện rà phá bom mìn, vật nổ
Dự án: Trạm biến áp 110 kV Phú Nghĩa và nhánh đường dây 110kV

TƯ LỆNH BỘ TƯ LỆNH THỦ ĐÔ HÀ NỘI

Căn cứ Quyết định số 96/2006/QĐ-TTg ngày 04/5/2006 của Thủ tướng Chính phủ về việc quản lý và thực hiện công tác rà phá bom mìn, vật nổ;

Căn cứ Thông tư số 146/2007/TT-BQP ngày 11/9/2007 của Bộ Quốc phòng hướng dẫn thực hiện Quyết định số 96/2006/QĐ-TTg;

Căn cứ Công văn số 694/HANOI DPMB-KTGS ngày 22/5/2015 của Ban Quản lý dự án phát triển Điện lực Hà Nội về việc đề nghị rà phá bom mìn, vật nổ dự án: "Trạm biến áp 110 kV Phú Nghĩa và nhánh đường dây 110kV";

Xét đề nghị của Tham mưu trưởng Bộ Tư lệnh Thủ đô Hà Nội,

QUYẾT ĐỊNH:

Điều 1. Tổ chức thực hiện công tác khảo sát lập phương án kỹ thuật, dự toán và tổ chức thi công rà phá bom mìn, vật nổ mặt bằng Dự án: Trạm biến áp 110 kV Phú Nghĩa và nhánh đường dây 110kV với các nội dung sau:

- Địa điểm: Xã Hòa Thạch, Cấn Hữu, Đông Yên, huyện Quốc Oai; xã Đông Phương Yên, Phú Nghĩa, huyện Chương Mỹ, thành phố Hà Nội.

- Chủ đầu tư: Tổng công ty Điện lực thành phố Hà Nội.

- Diện tích rà phá bom mìn, vật nổ (khoảng): 2,5 ha.

- Nguồn vốn: Vốn vay ADB.

- Đơn vị khảo sát, lập phương án kỹ thuật thi công, dự toán: Công ty TNHH MTV 29.

- Đơn vị thi công: Tổng công ty 319/Bộ Quốc phòng.

- Tiến độ thực hiện: Năm 2015.

Điều 2. Nhiệm vụ của Công ty TNHH MTV 29 và Tổng công ty 319/BQP:

- Công ty TNHH MTV 29 có nhiệm vụ: Tổ chức khảo sát xác định thực trạng, mật độ bom mìn, vật nổ diện tích mặt bằng trong phạm vi dự án do chủ đầu tư bàn giao tại thực địa; lập phương án kỹ thuật thi công, dự toán rà phá bom mìn, vật nổ theo kết quả khảo sát và yêu cầu tiến độ của chủ đầu tư, báo

cáo Bộ Tư lệnh Thủ đô Hà Nội thẩm định và phê duyệt làm cơ sở cho chủ đầu tư và các cơ quan liên quan kiểm tra, giám sát thực hiện.

- Tổng công ty 319/BQP có nhiệm vụ: Triển khai thi công rà phá bom mìn, vật nổ theo phương án được phê duyệt đảm bảo an toàn về bom mìn, vật nổ cho quá trình thi công cũng như khi đưa công trình vào khai thác sử dụng theo đúng yêu cầu tiến độ của dự án; phối hợp chặt chẽ với chủ đầu tư, các cơ quan, đơn vị liên quan để giám sát thi công và quản lý chặt chẽ địa bàn. Quá trình thực hiện, chấp hành đúng các quy định hiện hành của Nhà nước và Bộ Quốc phòng về công tác rà phá bom mìn, vật nổ.

Điều 3. Quyết định này có hiệu lực kể từ ngày ký. Tham mưu trưởng Bộ Tư lệnh Thủ đô Hà Nội; Công ty TNHH MTV 29; Tổng công ty 319/BQP và Thủ trưởng các cơ quan, đơn vị có liên quan thi hành Quyết định này./.

Nơi nhận:
- Như điều 3;
- Đ/c Tư lệnh (để báo cáo);
- BTM/BTL Thủ đô Hà Nội;
- BQL dự án phát triển Điện lực Hà Nội;
- Ban CHQS huyện: Quốc Oai; Chương Mỹ;
- Lưu: VT, CôB; T09.

KT.TƯ LỆNH
PHÓ TƯ LỆNH

BỘ QUỐC PHÒNG
BỘ TƯ LỆNH THỦ ĐÔ HÀ NỘI

Thiếu tướng Nguyễn Doãn Anh

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