Initial Environment Examination

Project Number: 41614-036
July 2017
(Addendum)

IND: Assam Power Sector Enhancement Investment Program - Tranche 4

Subproject : Addendum to IEE- for Change in Substation location of Radhabari 33/11kV Substation to Rangagorah 33/11 kV Substation

Submitted by

Assam Power Distribution Company Limited, Guwahati

Asian Development Bank

ASSAM POWER DISTRIBUTION COMPANY LIMITED
Reg. Office: Bijulee Bhawan, Paltanbazar, Guwahati-781 001, Assam
CIN: U40109AS2003SGC007242
PROJECT MANAGEMENT UNIT, 4th Floor, Bijulee Bhawan,
Tel. No.0361-2607533, Fax: 0361-2739526, E-mail: pmu_aseb@rediffmail.com

NK / JB

No. APDCL/PMU/Tr-4/235/2014/Pt-I/165 Date: 29-06-2017

ASIAN DEVELOPMENT BANK
INRM
COUNTRY DIRECTOR'S OFFICE
03 JUL 2017 / 2376
RECEIVED

To,
The Country Director,
Indian Resident Mission, ADB.
4, San Martin Marg, Chanakyapuri,
New Delhi – 110 021

Subject : **Re-submission of Addendum Initial Environmental Examination Report for 33/11kV Rangagorah (Radhabari) sub-station under Tranche -4, Loan No. 3200 –IND.**

Sir,

Please find enclosed herewith the Addendum to Initial Environmental Examination Report (re-submission) for 33/11kV Rangagorah (initially at Radhabari) sub-station under Tranche - 4, Loan No. 3200 –IND for your needful action.

Thanking you,

Yours faithfully,

29/06/17

Director (PMU), APDCL

Addendum
Initial Environmental Examination
(Change in substation location of Radhabari 33/11kV substation to Rangagorah 33/11 kV substation)

Loan Number: 3200-IND

June 2017

IND: Assam Power Sector Enhancement Investment Program – Tranche 4

Prepared by: Assam Power Distribution Company Limited
Government of Assam

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List of Acronyms

ADB	Asian Development Bank
AEGCL	Assam Electricity Grid Corporation Ltd.
APDCL	Assam Power Distribution Company Limited
APGCL	Assam Power Generation Corporation Limited
ASEB	Assam State Electricity Board
dB(A)	decibels
BOD	Biological Oxygen Demand
CPCB	Central Pollution Control Board
DO	Dissolved Oxygen
EA	Executing Agency
ESMU	Environmental and Social Management Unit
EARF	Environmental Assessment and Review Framework
EIA	Environment Impact Assessment
EMP	Environmental Management Plan
GPS	Global Positioning System
GOA	Government Of Assam
GOI	Government Of India
GSS	Grid Sub-Station
GRC	Grievance Redress Committee
GRM	Grievance Redressal Mechanism
IA	Implementing Agency
IEE	Initial Environmental Examination
km	kilometre
ha	Hectare
mi	Miles
Ltd.	Limited
m	Meter
NAAQS	National Ambient Air Quality Standards
NEA	National Environmental Act
kV	Kilo Voltage
MFF	Multi-Tranche Financing Facility
NH	National Highway
N/A	Not Applicable
R &R	Resettlement and Rehabilitation
PMU	Project Management Unit
PM_{10}	Particulate Matter 10micrometers or less
$PM_{2.5}$	Particulate matter 2.5micrometers or less
PCB	Poly Chlorinated Biphenyls
ROW	Right of Way
REA	Rapid Environmental Assessment
SEIAA	State Level Environment Impact Assessment Authority
SEAC	State Level Expert Appraisal Committee
SF6	Sulphur hexafluoride
SPM	Suspended Particulate Matter
SPS	Safeguard Police Statement
TSS	Total Suspended Solid
T E	Tea Estate
O&M	Operation and Maintenance
LT	Low Tension

A. INTRODUCTION

1. The Government of Assam (GoA), through the Government of India (GoI, the Borrower) has requested the Asian Development Bank (ADB) for a loan funding through the Multi-tranche Financing Facility (MFF) which was approved on 18 November 2009. The Assam Electricity Grid Corporation Limited (AEGCL) and the Assam Power Distribution Company Limited (APDCL) are the Executing Agencies (EAs) for the MFF[1] this project will be the Tranche 4 from the MFF with an estimated total amount of $50million.

2. GoA unbundled the former Assam State Electricity Board (ASEB) into three companies: Assam Power Generation Corporation Limited (APGCL), Assam Electricity Grid Corporation Limited (AEGCL), and Assam Power Distribution Company Limited (APDCL). The APDCL will be the Implementing Agency (IA) for Tranche 4. APDCL proposes to include the following components for Tranche 4:

a. Physical works in the sub-transmission and distribution system such as additional 33/11 kV lines and substations to ensure that the system is adequate and reliable to meet the growth demand and the energy requirement.
b. Energy efficiency measures and loss reduction measures to be undertaken for reduction of both commercial as well as technical losses mainly at low tension (LT) level. Also, reduction of length of 11 kV lines which are the primary cause of technical losses.
c. For loss reduction, improvement in quality of power and stability of distribution grid of APDCL by providing segregated feeders to Tea Estates (T.E.) for maximum revenue generation.
d. Introduction of Quick Response Operation and Maintenance (O&M) System in all Electrical Divisions and sub divisions of APDCL to ensure reliability and quality power with a view to increase revenue.
e. Implementation of IT Modules to cover part of the high value consumers of major towns of Assam to improve revenue by reduction in commercial loss.
f. Setting up of Independent Meter Testing Laboratory at Jorhat Engineering College.

3. As required by ADB's Safeguard Policy Statement 2009 (SPS 2009), an environmental assessment and review framework (EARF) was prepared for the MFF approved in 2009 to provide guidance on environmental screening, assessment, institutional arrangements, and procedures to be followed for the succeeding tranches in the MFF where components were not yet been fully defined and locations not identified. The EARF ensures that succeeding tranches comply with SPS 2009 and the applicable national laws and regulations.

4. According to SPS 2009, Tranche 4 is environment category B requiring an initial environmental examination (IEE). Following SPS 2009 and the EARF, an IEE was prepared for Tranche 4. As the EA for Tranche 4, APDCL is in charge of preparing the applicable environmental documentation, implementation and monitoring of Tranche 4 following the requirements of SPS 2009 and the approved EARF for the MFF.

5. This report is proposed as addendum to the APDCL's original Tranche 4 IEE report that was approved by ADB in August 2014.The addendum is on account of shifting of proposed substation at Radhabari site to Rangagorah site under Golaghat Electric Circle in Golaghat district. The report would capture information on the environmental consequences associated with the new location. This report is also a due diligence report and based on the assessment of the environmental impacts it has been observed that no further corrective actions are required to be

[1]The Assam State Electricity Board (ASEB) was legally dissolved in 2013. Subsequent to this action, AEGCL and APDCL were designated as EAs for the MFF

undertaken.

B. APPLICABLE ENVIRONMENTAL POLICIES AND OTHER LEGISLATIONS

6. The Ministry of Environment, Forest and Climate Change, GoI, vide its Notification No. S.O. 1533 dated 14-09- 2006, reengineered the EIA process in India and also decentralized some powers and made provision to constitute the State Level Environment Impact Assessment Authority (SEIAA) and the State Level Expert Appraisal Committee (SEAC) for performing functions under the said notification

7. Aside from SPS 2009, the project needs to comply with the requirements provided by the GoI acts, rules, notifications, standards, and policies and other state level guidelines that apply to the project. The relevant regulations and other legislations are given in Annexure I of original IEE report, August 2014 are applicable for this subproject.

C. SUB-PROJECT DESCRIPTION

8. As per original IEE, the sub-station site identified was identified at Radhabari tea estate in Golaghat district. The sub-station also include erection of 26 km of 33 kV transmission line from Lakhowjan GSS to Radhabari T.E. and four number of feeder points involving erection of 25km of 11kV distribution line. During the implementation stage it was found out that the selected substation site is not suitable for construction of 33kV incoming transmission line and 11kV outgoing distribution line. Consequently shifting of substation site from Radhabari Tea Estate was proposed by the project implementation unit (Annexure I (A)), Information regarding shifting of proposed substation was conveyed to ADB (Annexure I (B)). The ADB approval of shifting site substation site from Radhabari Tea Estate to Rangagorah Tea Estate is pending.

9. The new substation site (Fig. 1) is identified at Rangagorah Tea Estate in Golaghat district.The land for substation construction is provided by Rangagorah tea estate without any cost by the Rangagorah Tea Estate within the Tea Estate premise. The authority of Rangagorah Tea Estate has also given consent to donate the required land at a suitable location for construction of proposed substation (Annexure II). The new substation will be constructed on an area of 0.16 ha land of Rangagorah Tea Estate. The land for 33/11kV Rangagorah substation is (new location)is 5-7 km away from Radhabari Tea Estate (previous selected location) along the NH37 (new NH 715). The changes in site location will not result in any additional changes/requirement of parameters for 33kV incoming line and 11kV outgoing lines. The details of the new substation and associated 11kV distribution lines are provided in Table 1 and Table 2 respectively.

Table 1: Details of New Substation Site

S.No	Sub-project	Village/Tehsil	District	Region	Area (Ha)	Land Ownership
1	33/11kVRangagorah S/S	Rangagorah /Kamargaon	Golaghat	Upper Assam Region	0.16	RangagorahT.E.

10. The civil works progress achieved till month of May at Rangagorah sub-station is 74%. The construction of control room building, transformer pad, tower and equipment foundation is completed; and erection of various equipment is in progress.

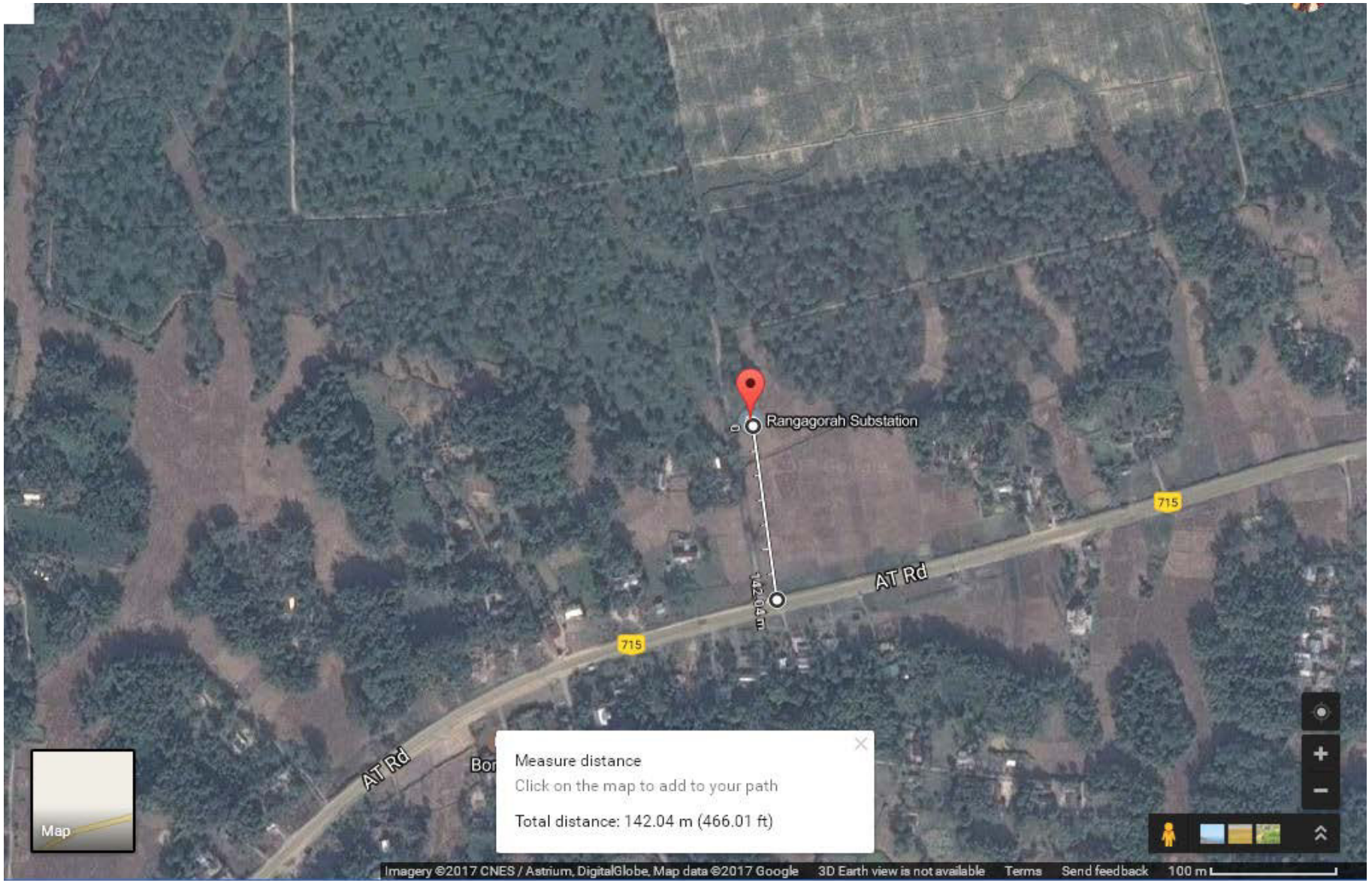


Fig 1: Location Map of 33/11kV Rangagorah Substation

Table 2: Details of Associated 11kV Distribution Lines

S.No.	Name of Sub-Project	Line Length (km)-	Right of Way (m)	No. of Poles	Area of each pole- (sq. m)	Names of Villages/T. E. Covered	Tehsil/ Districts Covered	General Profile of the line (Cropping pattern/Tea Estate/Forest	Whether alignment is final or not
33kV Line									
1	-	-	-	-	-	-	-	-	Route survey is yet to be conducted
11kV Line									
1	New 11kV Rangagorah Gaon feeder	5	7 m	147	1Sq M	Rangagorah Gaon, Rangagorah T.E.	Golaghat	Tea Estate and Paddy Field	Surveyed
2	New 11kV Rangagorah Bagan feeder	6.3		189					
3	New 11kV Mohora feeder	0.23		5					

D. APPROACH OR ADDENDUM PREPRATION

11. The Addendum to original IEE report (August, 2014) has been prepared based on site visits that were conducted in months of June 2016, September 2016, and May 2017 by Environmental and Social team supporting the Project Management Unit, APDCL. The observations made during the visit, informal one-to-one meeting with tea estate manager& officials of implementing agency, observations of environmental attributes and identification of sensitive receptors within vicinity of sub-station site. The information gathered during site visit has been used to complete the Rapid Environmental Assessment (REA) Checklist (Annexure III), which assisted in screening, categorization of sub-project and anticipating potential impacts on environment due to construction of sub-project and environmental category of sub-project.

E. DESCRIPTION OF ENVIRONMENT

12. The sub-project is located in the district of Golaghat. The identified new site is at a distance of 7 km (approx.) from the previous selected location. The descriptions of environment for this district have been captured in Section 3.0 (Description of Environment) of original IEE report prepared in August 2014, which adequately capture the environmental setting in the district and may be referred. The baseline information for air, noise, soil, and water quality have not been provided in the original IEE report. However, the monitoring of aforementioned environmental attributes will be conducted as per the provided frequency and parameters in the original IEE report and the detailed results will be provided in the respective Environmental safeguard monitoring report.

13. The site specific environmental features with reference to sub-station location are provided in **Table 3**, which would be used to assess the impact on environment due to the sub-project.

F. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

14. The preparation of this addendum is accordance to specified criteria provided in the Environmental Assessment Review Framework (EARF). These criteria were used for identifying the potential environmental impacts due to the sub-project in originally approved IEE report under the Chapter 4.0. The REA checklist prepared for the sub-project forms the basis for assessment

of potential environmental impacts and suggesting mitigation measures.

15. The Land details of new proposed 33/11kVRangagorah substation and distance from sensitive receptors is provided in Table 4

Table 3: Location Analysis for Rangagorah substations

Sl.No.	Particulars	Status
1	Land Details	Open Land (Rangagorah Tea Estate)
1.a	Area of land	0.16 Ha
1.b	Slope/Plain Land	Plain Land
1.c	Approximate Amount of land cutting required	N/A
2.	Owner Ship of land (Private / Forest/ Other Govt. Department/ Other)	Tea estate
3.	Private land (in ha.)	Not involved
	(i) Agriculture :- a) Irrigated b)Non – irrigated	Not involved
	(ii) Non - Agriculture/ Private Waste land / barren.	Non-agricultural land belong to Rangagorah Tea Estate
	(iii) House or Building: Residential Non –Residential	Not involved
4.	Distance from Nearest (With name)	
4.a	River (Name/Distance)	2.77km (Gelabill River) (Fig 2)
4.b	Highway	142.04 meters (NH 715(new)/37(old)) (Fig 1)
4.c	Forest Area	10.48 km Namligarh, 13.37 km, Kaziranga National Park
4.d	Village / town	Rangagorah Gaon
4.e	Market/Area of Economic Activity	Tea Garden
5.	Road accessibility	Kutcha Road
6.	EHV Line Passing Near By (Distance)	-
7.	HT line Passing Near By	-
8.	No. of Forest Trees :- Trees to be felled Trees to be lopped	Not involved
9.	No. of private trees	Not involved
	(i) Fruit Trees: Trees to be felled Trees to be lopped	Not involved
	(ii) Non - Fruit Trees: Trees to be felled Trees to be lopped	Not involved
10.	Distance from mountainous area	Approx100km- Lower Himalayan Mountain Range In Assam
11.	Distance from cultivated area	10m
12.	Altitude of substation	95m (Golaghat District)
13.	Nearest distance from airport/national& international boundaries	Jorhat Rowriah Airport –38.40km State Boundary(Nagaland)-38.63 km International Boundary (India-Myanmar)-128.82km
14.	Distance from nearest religious or archaeological sites	1.18km (Natyamandir Garigaon) from substation site.

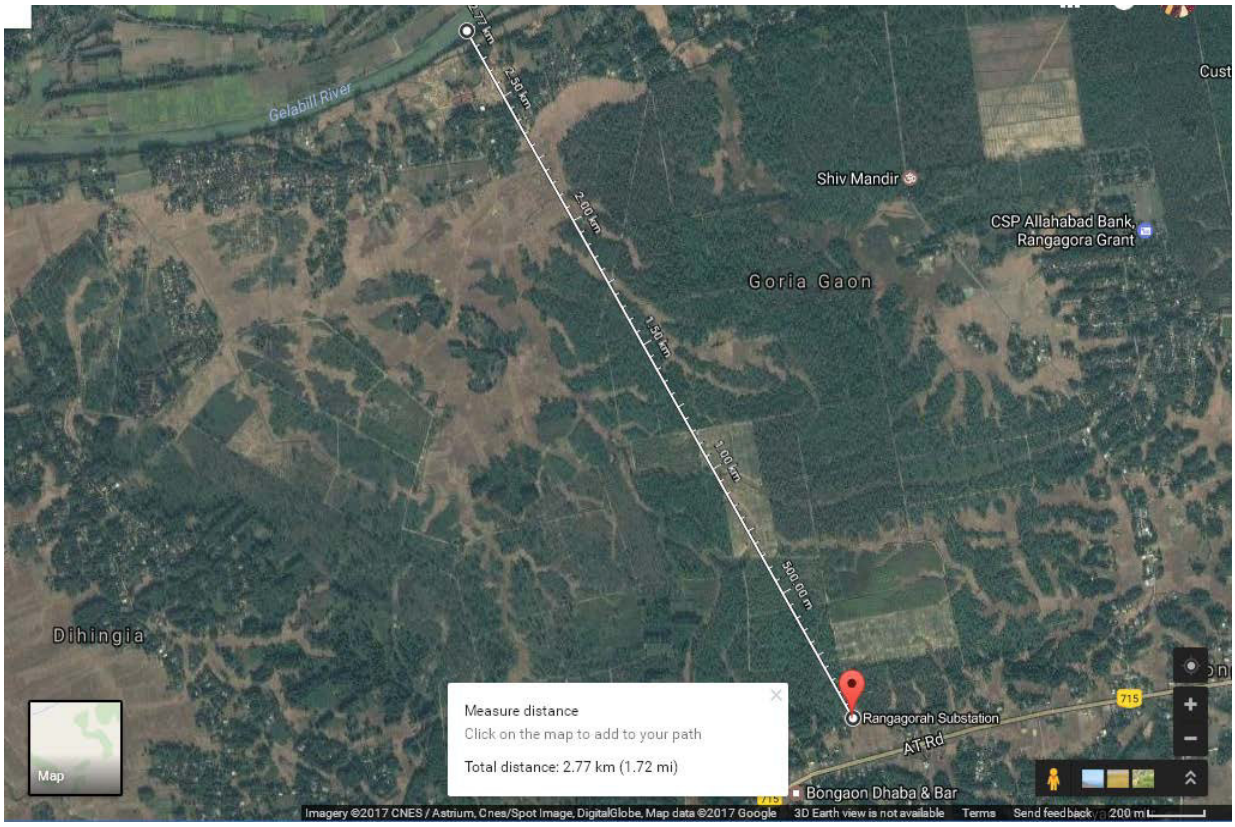


Fig 2: Gelabill River (2.77km from project site)

Table 4: Land Details of Rangagorah Substations

Village / Town Name	Tehsil Name	District Name	Land of substation identified/finalized?	Total Land Area Required (ha)	Ownership of Land	Type of Land	Status of Land Acquisition	No of Affected Households/ Owner	Number of affected Indigenous Household or Owners (If any)
Rangagorah	Kamargaon	Golaghat	Finalised	0.16	Private (Rangagorah TE)	Open Land	Land handed over by T.E (Consent for donation received)	Rangagorah Tea Estate	Not involved

16. The change in sub-station site and scale of construction being small will not change the environmental category of the project i.e. Category-B. The potential environmental impacts anticipated is mainly due to activities during construction of sub-station and has been specifically capture in Section 4.0 of original IEE report, which is also valid during construction of Rangagorah sub-station.

17. The shifting of sub-station site to Rangagorah has avoided cutting of trees that were going to be impacted due to four 11kV feeder lines that were traversing through Radhabari Tea Estate. In case of Rangagora, the extent of impact on tree is limited to pruning and trimming. Hence, the impact of the sub-project has been minimized.

G. ENVIRONMENTAL MANAGEMENT

18. The original IEE report has suggested appropriate measures to mitigate impacts associated with construction activities. An Environmental Management Plan has been prepared for the project that discusses the anticipated impacts, monitoring requirements, and development of mitigation measures with respect to the following stages: (i) Pre-Construction, (ii) Construction, and (iii) Operation and Maintenance.

19. The impacts associated with the sub-project are mainly due to activities during construction stage. Hence, the Environmental Management Plan (Annexure V) prepared for the project is adequate to mitigate the impacts due to sub-project.

H. INSTITUTIONAL REQUIREMENTS AND ENVIRONMENTAL MONITORING PLAN

20. The institutional arrangement has been agreed for the project and Environmental and Social Management Unit was created to support Project Management Unit for implementing environmental and social safeguards measures. PMU has designated one Assistant Manager as in charge of ESMU, who has oversight responsibilities for monitoring all subprojects in areas such as environmental, R&R and social safeguards. The duties of the ESMU will include at a minimum (i) oversight of field offices and construction contractors for monitoring and implementation mitigation measures. (ii) Liaising with the field officers and contractors and seeking their help to sole an environmental related issue of subproject implementations and (iii) preparation of environmental monitoring reports every 6 months (as required by ADB). ESMU is supported by individual Environmental and Social Safeguard consultant and assist in coordinating with PIU for monitoring as well as designing appropriate mitigation measures to address as environmental and social safeguard issues.

21. The minimal provision for environmental monitoring program was not provided in the original IEE report prepared in August 2014. However, the same was provided in Clause 9.8 (contractor's responsibility) under Section 8 (Special Conditions of Contract) of the Bidding Document.

22. Presently, project is in implementation stage and the construction work has started and Executing Agency is monitoring compliance to environmental safeguard requirements in the Loan Agreement. The same has been reiterated to the contactor by Project Implementation Unit. The compliance action status for minimal provision for environmental monitoring is provided in Table 5.

I. GRIEVANCE REDRESS MECHANISM

23. The formation of GRM and GRC at project level is one of the requirements in Project Administration Manual and Loan Agreement. Till now, GRC committee has been constituted in Guwahati Zone, and Dibrugarh Zone. This is in progress in remaining zones. APDCL is following with concerned Chief Executive Officer for formation of Grievance Redressal Committee (GRC) in their respective circle.

24. Till date no grievance has been reported with respect to the sub-project. Any grievance from any person will be addressed in set time frame and will be properly documented.

J. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

25. Site visit to Rangagorah sub-station was conducted in month of June and September 2016 to check adequacy of the site and to check the environmental compliance. The consultation was undertaken (Annexure IV) with representative of Rangagorah Tea Estate on May 12, 2017. The consultation meeting was attended by officials from PMU, field implementing agency, and coordinated by Environmental & Social team. The consultation was limited to meeting with

representative of tea estate to understand their view and concerns with regard to land for sub-stations and impacts associated with stringing of 33kV and 11kV lines. The key points of the consultation are:

- Rangagorah T.E authority shown their support for the sub-station and were happy for the dedicated feeder line being provided to their tea factory.

- The Tea Estate representative raised his concerns related to safety and risk associated due to 33kV transmission and 11kV distribution line during harsh climatic conditions. He also requested to provide proper guarding at the crossings of 33kV transmission line and 11kV distribution lines. In addition, the need for regular site inspections by the implementing agency over the stretch of line during operation period was also highlighted.
- Manager of Rangagorah T.E informed that they would provide all support for pruning and trimming of trees within the RoW of the 33kV and 11kV line.
- The manager of Rangagorah T.E advised to provide the job opportunity to local residents at the new constructed 33/11kV Rangagorah substation.

26. The addendum to IEE shall be disclosed and made available to the public.

K. CONCLUSION

27. This addendum to IEE is based upon the environmental assessment and review framework (EARF) which is consistent with the ADB's Safeguard Policy Statement (SPS) 2009. The subproject is classified as category "B" for environmental and does not require further environmental impact assessment. The original EMP prepared for the project is valid and the same is recommended for adoption during implementation stage.

Table 5: Provision for Environmental Monitoring

Project Stage	Mitigation Measure	Parameters to be Monitored	Location	Measurements	Frequency	Responsibility	Cost
Pre Construction	Route survey to define alternative alignments	Possible encroachment on reserved forests	All transmission and substation sites	Field mapping with Global Positioning System (GPS) equipment	1-time survey to finalize design	APDCL/PMU through route survey contractor	n/a
Construction	Dust equipment emissions erosion and noise control waste management	Incorporation of appropriate clauses in construction contracts	All construction contracts for all substation and transmission sites	Field inspection to ensure that appropriate measures are implemented and facilities are installed	1 time per month	APDCL and PMU to include in bidding documents. ADB to verify through review of bidding documents[2]	Included in construction n contract (estimated at <0.5% of total contract value)
	Dust equipment emissions, and erosion control Waste management	Suspended particulate matter[3] (SPM) Noise Water pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), total suspended solids (TSS), hydrocarbon and PCBs[4] Solid waste generation and disposal	All substation sites and Selected transmission lines	"Grab" samples for air and water Spot check for noise using portable monitoring device Spot check for solid waste generation and disposal	Every 6 months beginning with initial activity for total of 18 months Monitoring will be extended if necessary Spot checks for solid waste activates	Contractors to implement PMU staff to provide oversight via regular field inspections ADB to audit during project review missions APDCL has responsibility for solid waste management	
Operation and Maintenance	Dust equipment emissions, and erosion control Waste management	Same parameters as during construction phase	All substations and transmission lines	Spot checks based on visual inspections and any complaints	As necessary based on inspections and complaints	APDCL through PMU ADB to audit during project review missions	

ADB = Asian Development Bank, APDCL = Assam Power Distribution Company Ltd., BOD = biochemical oxygen demand, DO =dissolved oxygen, PCB = polychlorinated biphenyls, PMU = project management unit, SPM = suspended particulate matter, TSS = total suspended solids.

Source: Asian Development Bank assessment.

[2]ADB will review documents and provided no objection at each stage of bidding, contract evaluation and contract award.

[3] Originally, Suspended Particulate Matters was indicated for monitoring air quality. However, this has been replaced with PM_{10} and $PM_{2.5}$ considering NAAQS, 2009 of CPCB.

[4] These parameters should be monitored if warranted based on visual observations or complaints.

Annexure I (A)

Administrative Approval Letter

(Shifting Of 33/11kv Radhabari Substation to Rangagorah Substation)

ASSAM POWER DISTRIBUTION COMPANY LTD.
Registered Office : Bijulee Bhavan , Paltan Bazar, Guwahati - 781001
CIN- U40109AS2003SGCOO7242
Project Implementation Unit
Tel No.-0361-2733094; Fax-0361-2739535; email: cpm_piuadb@hotmail.com

Received from PIU on 21.07.16

NO. CPM(PIU)/APDCL/Tech-8/Trnanche-4/2013-14/128 Date: 18th July , 2016

To

The Director (PMU)
APDCL , Bijulee Bhawan
4th Floor, Guwahati-01

Sub.:- Shifting of proposed 33/11 KV 2X5 MVA Radhabari SS under ADB Tranche 4 Project from Radhabari Tea Estate to Rangagorah Tea Estate under Golaghat Electrical Circle.

Sir,

As proposed and as per discussion with CGM(D), UAR, APDCL considering the points as given below, the location of construction of 33/11 KV 2X5 MVA Substation at Radhabari Tea Estate is shifted to Rongagorah Tea Estate under Golaghat Electrical Circle. The cause of shifting of location of Substation at Radhabari TE to the location of Rongagorah TE is as given below:

As reported by the AGM, Golaghat Electrical Division the reason behind shifting the location of 33/11 KV 2X5 MVA Substation from Radhabari TE to Rongagorah TE under Golaghat Electrical Division is as follows:

1. **The Substation was proposed to be constructed at the land of Radhabari Tea Estate but after final inspection along with CEO, Golaghat Electrical Circle the plot of land at Radhabari Tea Estate is found to be inferior and there will be technical problem in drawing the 33 KV incoming line and 11 KV outgoing lines.**
2. **The Authority of Rongagorah Tea Estate has given consent for donating the required land for the Substation which is 5-7 KM away from Radhabari Tea Estate along the National Highway no. 37, and accordingly the new plot of land donated by Authority of Rongagorah TE has been finalised.**
3. **No additional parameters of 33 KV incoming line & others will be required to constructed the 33/11 KV Substation at Rongagorah Tea Estate instead of at Radhabari Tea Estate.**

It is also proposed to change the name of the above Substation to Rongagorah Substation in place of Radhabari Substation.

This is for your kind information and necessary action.

Thanking you,

Yours faithfully

18/07/16

Chief Project Manager (PIU-ADB)
APDCL, Bijulee Bhawan, Paltanbazar
Guwahati-01.

Memo. No. CPM(PIU)/APDCL/Tech-8/Trnanche-4/2013-14/128(a-e) Date: 18th July , 2016

Copy to:

1. The PS to MD, APDCL for kind appraisal of MD, APDCL, Bijulee Bhawan, Ghy-01.
2. The CGM(PP&D),APDCL, Bijulee Bhawan, Ghy-01 for kind information.
3. The CGM(D), UAR, APDCL, Bijulee Bhawan, Ghy-01 for kind information
4. The GM, Jorhat Electrical Zone, APDCL, Jorhat for kind information.
5. The CEO, Golaghat Electrical Circle,Golaghat for information & necessary action..

18/07/16

Chief Project Manager (PIU-ADB)

Annexure I (B)

Letter to ADB for Approval

(Shifting Of 33/11kv Radhabari Substation to Rangagorah Substation)

ASSAM POWER DISTRIBUTION COMPANY LIMITED

Reg. Office: Bijulee Bhawan, Paltanbazar, Guwahati-781 001, Assam

CIN: U40109AS2003SGC007242

PROJECT MANAGEMENT UNIT, 4th Floor, Bijulee Bhawan,

Tel. No.0361-2607533, Fax: 0361-2739526, E-mail: pmu_aseb@rediffmail.com

No. APDCL/PMU/APSEIP/T-4/S & E/252/ 31 Dtd. 20/07/2016

To

Ms M. Teresa Kho, Country Director
Indian Resident Mission, ADB
4 San Martin Marg, Chanakyapuri
New Delhi-110021

Sub: - Shifting of proposed 33/11 KV, 2x5 MVA Radhabari S/S under ADB Tranche-4 Project (Loan No -3200-IND: Package-1) to Rangagorah Tea Estate under Golaghat Electrical Circle.

Dear Madam,

In inviting a reference to the subject cited above, I am to inform you that APDCL is considering to shift the proposed site of 33/11 KV, 2x5 MVA Radhabari Substation under Package-1 of Tranche-4(Loan No -3200-IND) from Radhabari Tea Estate to Rangagorah Tea Estate under ~~Tinsukia~~ Golaghat Electrical Circle on the following reasons.

1. The location of Radhabari Tea Estate is not suitable for drawing the 33 KV incoming line as well as 11 KV outgoing lines.
2. The authority of Rangagorah Tea Estate has given consent to donate the required land at a suitable location for construction of the proposed Sub Station.

There will not be any major changes in line parameters due to the proposed change of site and the new location will also be under Lot 3 of Package 1. We shall undertake necessary safeguard due diligence by assessing potential environmental and social impacts and incorporating the same in revised IEE & RP of Tranche-4.

This is for favour of your kind needful action.

Sincerely yours

Director (PMU)
APDCL

Annexure II

Land Deed Agreement of 33/11kv Rangagorah Substation

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

असम ASSAM B 490982

SL-NO. 908/16

NOTARY ★ GOVT. OF ASSAM ★ NILAKANTA HAZARIKA B.A. LL.B Area Golaghat Dist. Regd. No. GLF03

Arjun Verma

Sri Bul Chandra Bhattacharya

DEED OF AGREEMENT

This Indenture is made on Wednesday of 27.01.2016, between the Manager, Rungagora Tea Estate, represented by Mr. Arjun Verma, P.O. Badulipara, P.S. Kamargaon, Dist. Golaghat, Assam, herein after called the 'DONER'.

The Sub-Divisional Engineer, Kamargaon Electrical Sub-Division, APDCL, UAR, Golaghat, P.O. Kamargaon, P.S. Kamargaon, Dist. Golaghat, Assam, herein called the 'DONEE'.

Whereas the above named 'Doner' has possession over a plot of land measuring 1(One) Bigha.. 1(One) Katha, which is more fully described below and agreed to donate the said land which was selected by APDCL, Golaghat, to construct a 33/11 KV Power Sub-Station under ADB Finance Scheme.

2.2.16 NOTARY

AND

The 'Donee' has agreed to construct the said electrical 33/11 KV, 2x5 MVA Sub-Station in the aforesaid land and an 11 KV dedicated tea feeder will be constructed for Rungagora Tea Estate to provide uninterrupted and quality supply of power in lieu of the said plot of land.

Now, this Indenture witnessed and the said 'Doner' signed this deed on the day, month and year herewith mentioned above.

Schedule of land : A plot of land measuring 01(One) Bigha, 01(One) Katha & 0 Locha, out of total land measuring 1905 Bighas, 0 Katha & 01 Locha, covered by Dag No. 197, T.P.P. No.1 of Rungagora Tea Estate.

Boundary of Land:

North :: Rungagora Tea Estate, Section No. 15(D).

South :: N.H. - 37

East :: Rungagora Tea Estate, Section No. 15(D).

West :: Rungagora Tea Estate, Section No. 14(B).

NOTARY
NILAKANTA HAZARIKA
B.A. LL.B
Area Golaghat Dist.
Regd. No. GLT-03
GOVT. OF ASSAM

DONEE

Bul Chandra Bhatta
Sub-Divisional Engineer
Kamargaon Electrical Sub-Division
APDCL, UAR, Kamargaon.

Sub-Divisional Engineer
Kamargaon Electrical Sub-Division
ASEB Kamargaon

DONER

Arjun Verma
Manager
Rungagora Tea Estate
P.O. Badulipara, Golaghat.

Manager
Rungagora T. E.
P.O. Badulipar

Witness:

1)
Asstt. General Manager
Golaghat Electrical Division
A.P.D.C.L., Golaghat

By (ANANTA SAIKIA)
Kamargaon Elect Sub-Division
APDCL, A.S.E.B
Kamargaon

Witness:

1) R. N. Choudhary

2. Dilip Mishra
(welfare officer)
Nimalichuk T.E.

2-2-16

NOTARY

Regd. No-2586

RUNGAGORA T.E.

JOREHAUT GROUP LTD.
P.O-BADLIPAR
GOLAGHAT
ASSAM

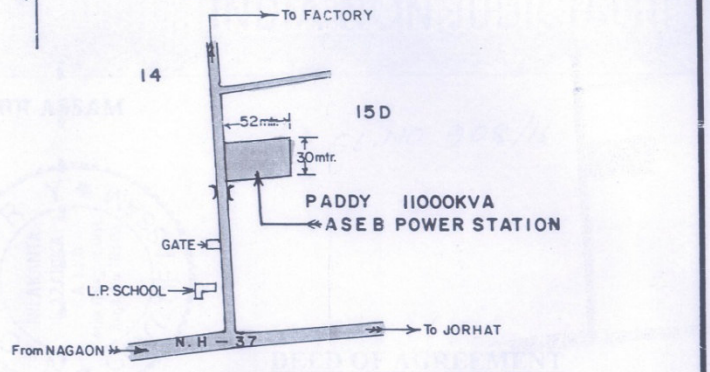
SCALE:-16 Inch to A Mile

SURVEYED IN DEC '15 & DRAWN By,

Partner
M/s K.D SURVEY ENTERPRISE.
Govt. Approved Surveyor's
BOKAKHAT-785612
GOLAGHAT (ASSAM)

M/s K. D. Survey Enterprise
Date- 5-12-15
Map No- 3365
Govt. Approved Surveyor's

M. North



REFERENCE

ROAD & CULVERT	
LOW & PADDY LAND	
ASEB POWER STATION-11000KVA	
TOTAL AREA OF POWER STATION	6 Katha 0'16 ha.

Sub-Divisional Engineer
Kamargaon Electrical Sub-Division
ASEB Kamargaon

Manager
Rungagora T. E.
P O. Badulipar

NOTARY

AND

The 'Donee' has agreed to construct the said electrical 33/11 KV, 2x5 MVA Sub-Station in the aforesaid land and an 11 KV dedicated tea feeder will be constructed for Rungagora Tea Estate to provide uninterrupted and quality supply of power in lieu of the said plot of land.

Sri Bul Chandra Bhetia, Arjun Verma

Annexure III

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 the 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: Assam Power Sector Enhancement Investment Program, Trench-4 (IND-

Sector Division: Building and Township

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following areas?		√	Project area is not in the vicinity of any such area.
Underground utilities		√	
Cultural heritage site		√	
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay			
B. Potential Environmental Impacts Will the Project cause…			
Encroachment on historical/cultural areas?		√	No historical/cultural area or monument is present near project area.

Screening Questions	Yes	No	Remarks
Encroachment on precious ecology (e.g. sensitive or protected areas)?		√	Project area is not present near any sensitive area.
Impacts on the sustainability of associated sanitation and solid waste disposal systems?		√	No such impact will occur.
Dislocation or involuntary resettlement of people?		√	Proposed project area is present in a tea estate. No dislocation or resettlements will occur.
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact will result.
Accident risks associated with increased vehicular traffic, leading to loss of life?	√		Movement of vehicles for transportation of construction material will be from pre-existing roads which will increase the traffic for short duration of time.
Increased noise and air pollution resulting from increased traffic volume?	√		Noise and air pollution from vehicular movement will occur only for short duration of time and will be temporary.
Occupational and community health and safety risks?	√		Occupational health and safety risks may occur due to improper management of sanitation facility and construction material store in project area.
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	√		No radiological hazards are expected. However chemical hazard can result due to mismanagement of transformer oil. Biological and physical hazard can occur due to improper sanitation and storage facilities respectively.
Generation of dust in sensitive areas during construction?		√	Sensitive areas are not present in vicinity of project area thus no such impact will occur.
Requirements for disposal of fill, excavation, and/or spoil materials?	√		Disposal facility will be required for material excavated for construction of transformer base.
Noise and vibration due to blasting and other civil works?	√		Blasting is not involved in construction of substation thus not such impact will result. However due construction phase noise level may increase due to working of machinery.
Long-term impacts on groundwater flows as result of needing to drain the project site prior to construction?		√	No such impact will occur.
Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?		√	No such impact will occur.

Screening Questions	Yes	No	Remarks
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	No such impact will occur. Only five-six labor will be required during construction phase.
Social conflicts if workers from other regions or countries are hired?		√	Workers and labor will be hired from local and regional areas to increase the employment opportunity.
Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation?	√		Proper measures, sign boards and public consultation can decrease the risk to community health and safety if any failure occurs during operation stage.
Risks to community health and safety caused by management and disposal of waste?		√	No such risk will occur.
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project 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?		√	Project area is located away from the locality thus no such risk will result.

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)?	√		Project area is present in seismic zone-5
Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		√	
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)?		√	There are no demographic or socio-economic aspects of project area.
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)?		√	Project area is away from settlement (tea estate).

Appendix I: Environments, Hazards and Climate Changes

Environment	Natural Hazards and Climate Change

Arid/ Semi-arid and desert environments	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of dry lands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.
Humid and sub-humid plains, foothills and hill country	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heat waves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.
River valleys/ deltas and estuaries and other low-lying coastal areas	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.
Small islands	Small islands generally have land areas of less than 10,000km^2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.
Mountain ecosystems	Accelerated glacial melting, rock falls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermountain valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.
Volcanic environments	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ash fall.

Annexure IV

Consultation

Public Consultation

Name of the Sub-project	33/11KV Rungagorah (Radhabari) S/S
Name of the Village/s	Rungagorah T. Estate
Venue	Tea. Estate Manager's Chamber
Date	12/05/2017
No. of Participants attended	8
Consultations conducted by	ESMU Team

Objectives:

- To inform the community about the sub-project
- To understand their overall socio-economic condition
- To understand their views and perceptions on project

Issues Discussed & Observation made:

(১) ৰংগাগড়া চাহ বাগানৰ মেনেজাৰে জানিবলৈ দিয়ে যে তেওঁলোকৰ চাহ বাগানত ৩৩/১১ কেভি উপ-আস্থান (Sub-station) হোৱাৰ বাবে তেওঁলোক সুখী হৈছে কাৰণ ইয়াৰ ফলত তেওঁলোকে স্বতন্ত্ৰ ভাবে ১১ কেভি পৰিবহন লাইন পাব।

(২) উপ-আস্থানৰ লাইনৰ বাবে প্ৰয়োজন হোৱা পদ-খুটিৰ বাবদ যদি আপত্তিবিহীন অনুমতি লাগে তেওঁলোকে দিবলৈ সাজু বুলি জনায়।

(৩) চাহ বাগানৰ কৰ্তৃপক্ষই ভৱিষ্যতে যদি উপ-আস্থানৰ কিবা-চাকৰি/কাম উলিয়াই তেন্তে চাহবাগানৰ বাসিন্দা সকলে প্ৰথমে প্ৰাধান্য পাব লাগিব বুলি কয়।

(৪) উপ-আস্থান নিৰ্মাণ কাৰ্য্যৰ সময়ত ওচৰ-চুবুৰীয়াৰ সুখ-সুবিধাৰ প্ৰতি লক্ষ্য ৰাখি কাম সম্পূৰ্ণ কৰিবলৈ জানিবলৈ দিয়ে।

Attendance Sheet

Date: 12/05/2017
Sub-Project Name: 33/11KV Rangagora (Radhakari) S/S.
Village/s: At Sre. Manager chamber, Rangagara T.E.

Sl. No.	Name	Address	Occupation	Signature
1	Mrs. Arjun Barman	Rangagara T.E.	Manager	
2	Mr. R. N. Choudhary	Rangagara T.E.	Asstt. Manager	
3	Mr. Ananta Saikia	Kamargaon Sub-div"	FMB	
4	Mr. Kalyan Krishna Saikia	Kamargaon Sub-division	SMR	
5				
6	Sachin Talukdar	Director, PMU, APDCL	Asstt. Manger	
7	Navroz Kaur	ESMU, PMU	Environmental Investigator	
8	Dibya Jyoti Baruah	ESMU, PMU	Social/Env. Prof.	
9	~~Soc~~ Khanin Baishya	ESMU, PMU	-do-	
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Annexure V

Environmental Management Plan

Project Activity	Potential Environmental Impact	Mitigation Action	Monitoring Scope	Standards	Institutional Responsibility	Implementation Schedule
Pre-construction						
Temporary use of lands	Impact to the existing environment	Selection of lands adhering to local laws and regulations and in close consultation with LAs Construction facilities should be placed at least 10 m away from water bodies, natural flow paths, important ecological habitats and residential areas	Water and air quality	Air quality Standards and CPCB water quality standards	APDCL Contractor	Detailed design
Substation location and design	Noise generation Exposure to noise, Nuisance to neighboring properties	Substation designed to ensure noise will not be a nuisance.	Expected noise emissions based on substation design, noise levels	Noise control regulations. Noise levels to be specified in tender	APDCL	Detailed design
	Disturbance to the adjacent lands and the people due to cut and fill operations	Maintain adequate clearance, construction of retaining structures, minimize cut and fill operations adjoining to the dwellings	Proximity to houses and other structures	Documents Setback distances to nearest houses – as per ROW norm of 5 m	APDCL	Detailed design
Location of poles and line alignment and design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Location of distribution poles and line alignment selection with respect to nearest dwellings	Setback distances to nearest houses -	APDCL	Part of line sighting survey and detailed alignment survey and design
	Impact on water bodies /land/ residences	Consideration of site location at where they could be located to avoid water bodies or agricultural land as much as possible. Careful site selection to avoid existing settlements	Site location away from water bodies, line alignment selection(distance to dwelling, water and/or agricultural land)	Consultation with local authorities and land owners, CPCB water quality standards	APDCL	Part of detailed project sighting and survey and design
Equipment specifications and design parameters	Release of chemicals and harmful gases in receptors (air, water, land)	PCBs not used in substation transformers or other project facilities or equipment.	Compliance with National Environmental Act	Banned under NEA	APDCL	Detailed design

Project Activity	Potential Environmental Impact	Mitigation Action	Monitoring Scope	Standards	Institutional Responsibility	Implementation Schedule
Encroachment into precious ecological areas	Loss of precious ecological values/damage to precious species	Avoid encroachment by careful site and alignment selection Minimize the need by using existing poles and RoW wherever possible	Floral and faunal habitats loss	Environmental Conservation Act	APDCL	Detailed design
Encroachment into forest areas	Trees to be cut for distribution line	Avoid trees to be cut by careful site and alignment selection. Minimize the Row wherever possible Afforestation to be done in coordination with forest department	Loss of trees in the alignment	Forest Conservation Act	APDCL	Detailed design
Involuntary resettlement or land acquisition	Loss of lands and structures	Compensation paid for temporary/permanent loss of productive land	Public complaints	Rates stipulated in the Resettlement plan/ Frame work	APDCL	Prior to construction phase
Encroachment into farmland	Loss of agricultural productivity	Use existing poles wherever possible Avoid sighting new towers/poles on farmland wherever possible Farmers compensated for any permanent loss of productive land trees that need to be trimmed or removed along RoW.	Pole location and line alignment selection Design of Implementation of Crop and tree compensation(based on affected area)Statutory approvals for tree trimming /removal	Consultation with local authorities and design engineers	APDCL	Part of detailed alignment survey and design
Interference with drainage patterns/Irrigation channels	Temporary flooding hazards/loss of agricultural production	Appropriate sighting of poles to avoid channel interference	Site location and line alignment selection	Consultation with local authorities and design engineers	APDCL	Detailed alignment survey and design
Explosions/Fire	Hazards to life	Design of substations to include modern fire control systems/firewalls. Provision of firefighting equipment to be located close to transformers, power generation equipment.	Substation design compliance with fire prevention and control codes	Tender document to mention detailed specifications	APDCL	Part of detailed substation layout and design/ drawings
Construction						
Removal or disturbance to other public utilities	Public inconvenient	Advance notice to the public about the time and the duration of the utility disruption Use of well trained and experienced machinery operators to reduce accidental damage to the public utilities Restore the utilities immediately to overcome public inconvenience	Disruption other commercial and public activities / Public complaints	Technical specification	APDCL	Throughout the construction period

Project Activity	Potential Environmental Impact	Mitigation Action	Monitoring Scope	Standards	Institutional Responsibility	Implementation Schedule
Acquisition of paddy fields and other lands	Loss of agricultural productivity	Avoid farming season wherever possible for the project activities. Ensure existing irrigation facilities are maintained in working condition Protect /preserve topsoil and reinstate after construction completed Repair /reinstate damaged bunds etc after construction completed Compensation for temporary loss in agricultural production	Land area of agriculture loss Usage of existing utilities Status of facilities (earthwork in m^3) Implementation of Crop compensation (amount paid, dates, etc.)	Regular monitoring compliance with regulations	APDCL, Contractor through contract provisions	Throughout the construction period
Temporary outage of the electricity	Loss of power supply to the local community when distribution lines crossing the new line are switched off	Advance notice to the public about the time and the duration of the utility disruption Restore the utilities immediately to overcome public inconvenient.	Houses and commercial premises of power disruption	Regular monitoring during the period of strengthening the conductors	Contractor APDCL	Throughout the construction period
Equipment layout and installation	Noise and vibrations	Selection of construction techniques and machinery to minimize ground disturbance.	Construction techniques and machinery	Minimal ground disturbance	APDCL, Contractor through contract provisions	Construction period
Substation construction	Loss of soil	Fill for the substation foundations obtained by creating or improving local drain system.	Borrow area sighting(area of site in m^2 and estimated volume in m^3)	Laws and regulations of respective LAs	APDCL, Contractor through contract provisions	Construction period
	Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season.	Seasonal start and finish of major earthworks	Timing of major disturbance activities - prior to start of construction activities	APDCL, Contractor through contract provisions	Construction period
Construction schedules	Noise nuisance to neighboring properties	Construction activities only undertaken during the day and local communities informed of the construction schedule.	Timing of construction(noise, [dB(A)])	Daytime construction only	APDCL, Contractor through contract provisions	Construction period
	Nuisance to wildlife if the line route construction crosses migratory	Complete restriction of construction work for two months before and after the known period of migration by the animals	Timing of Construction	No construction for two months	APDCL, Contractor	Construction period

Project Activity	Potential Environmental Impact	Mitigation Action	Monitoring Scope	Standards	Institutional Responsibility	Implementation Schedule
	path					
Provision off anilities for construction workers	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	Presence of proper sanitation, water supply and waste disposal facilities	APDCL, Contractor through contract provisions	Construction period
Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Any excess material will only be used as fill material offsite when the owner's agreement has been obtained and with the disposal site restored in a manner that prevents erosion and does not block any drainage path	Location and amount(m^3) of fill disposal Soil disposal locations and volume (m^3)	Appropriate fill disposal and dispersal locations	APDCL, Contractor through contract provisions	Construction period
Air Pollution	Loose dust might blow in the area causing dusty conditions	Dampening of dust by sprinkling of water within the work area and stack the loose soil and contain it with covers if required.	Soil stacking locations, access roads, pole locations, substation site	Air Quality Standards	APDCL, Contractor through contract provisions	Construction period
Wood/vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation	Construction workers prohibited from Harvesting wood in the project area during their employment.	Illegal wood /vegetation harvesting (area in m^2,number of incidents reported)	Complaints by local people or other evidence of illegal harvesting	APDCL, Contractor through contract provisions	Construction period
	Effect on fauna	Prevent his work force from disturbing to the flora, fauna including hunting of animal and fishing in water bodies Proper awareness program regarding conservation of flora, fauna including ground vegetation to all drivers, operators and other workers	Habitat loss	Fauna and flora protection Act.	APDCL/ DWC/ DoF	Construction period
Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Vegetation marking and clearance control(area in m^2)	Forest Conservation Act. Clearance strictly limited to target vegetation	APDCL, Contractor through contract provisions	Construction period
	Soil erosion and surface runoff	Construction in erosion and flood-prone areas should be restricted to the dry season Treat clearing and filling areas against flow acceleration and construction work should be carefully designed to minimize obstruction or destruction to	Soil erosion	Visual inspection (Turbidity and sedimentation)	APDCL, Contractor through contract provisions	Construction period

Project Activity	Potential Environmental Impact	Mitigation Action	Monitoring Scope	Standards	Institutional Responsibility	Implementation Schedule
		natural drainage				
Mechanized construction	Noise, vibration and operator safety, efficient operation Noise, vibration, equipment wear and tear	Construction equipment to be well maintained. Proper maintenance and turning off equipment not in use.	Construction equipment - estimated noise levels and operating schedules	Technical specifications, safety regulations, Noise control regulations of CPCB	APDCL, Contractor through contract provisions	Construction period
Construction of roads for accessibility	Increase in airborne dust particles Increased land requirement for temporary accessibility	Existing roads and tracks used for construction and maintenance access to the site wherever possible. New access ways restricted to a single carriageway width within the RoW.	Access roads, routes(length and width of new access roads to be constructed)	Use of established roads wherever possible Access restricted to single carriageway width within RoW	APDCL, Contractor through contract provisions	Construction period
Transportation and storage of materials	Nuisance to the general public	Transport loading and unloading of construction materials should not cause nuisance to the people by way of noise, vibration and dust	Water and air quality	Laws and regulations of respective states National Emission	APDCL/ CPCB	Construction period
		Avoid storage of construction materials beside the road, around water bodies, residential or public sensitive locations Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner		Standards and CPCB water quality standards		
Trimming/cutting of trees within RoW	Fire hazards Loss of vegetation and deforestation	Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations. Trees that can survive pruning to comply should be pruned instead of cleared. Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Species-specific tree retention as approved by statutory authorities(average and maximum tree height at maturity, in meters)Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m^2)	Forest Conservation Act Presence of target species in Row following vegetation clearance.	APDCL, Contractor through contract provisions	Construction period
Health and safety	Injury and sickness of workers and members of the	Contract provisions specifying minimum setback requirements for construction camps from water bodies, reserved areas etc.	Contract clauses(number of incidents and total lost-work days caused by	Health and safety regulations	APDCL, Contractor through contract	Construction period

Project Activity	Potential Environmental Impact	Mitigation Action	Monitoring Scope	Standards	Institutional Responsibility	Implementation Schedule
	public	Contractor to prepare and implement health and safety plan. Contractor to arrange for health and safety awareness programs	injuries and sickness)		provisions	
Nuisance to nearby properties	Losses to neighboring land uses/ values	Contract clauses specifying careful construction practices. Use existing access ways as much as possible. Productive land will be reinstated following completion of construction Compensation will be paid for loss of production, if any.	Contract clauses Design basis and layout Reinstatement of land status (area affected, m^2) Implementation of Tree/Crop compensation (amount paid)	Incorporating good construction management, design engineering practices Consultation with affected parties immediately after completion of construction and after the first harvest	APDCL, Contractor through contract provisions	Construction period
Operation and Maintenance Phase						
Electric shock	Death or injury to the workers and public	Security fences around substation Establishment of warning signs Careful design using appropriate technologies to minimize hazards	Proper maintenance offences and sign boards Usage of appropriate technologies (lost workdays due to illness and injuries)	Periodic maintenance Number of programs and percent of staff/workers covered	APDCL	Throughout the operation
Noise generation	Nuisance to the community around the site	Provision of noise barriers	Noise level	Noise level [db (A)]-Once a year	APDCL	Throughout the operation
SF6 Gas levels	Leakage of SF6	Monitoring of SF6 gas from Electrical Substations	Measurement using hand held devices	0.1%-0.5% as per design	APDCL	Throughout operation
Maintenance of Distribution line	Exposure to electromagnetic interference	Distribution line to comply with the design parameters of electromagnetic interference from cables	Required ground clearance (meters)	Ground clearance as per APDCL norms	APDCL	Throughout the operation
Substation maintenance	Exposure to electromagnetic interference	Substation design to comply with the parameters of electromagnetic interference from instruments within floor area	EMF measurement, instrumentation	Technical specifications	APDCL	Throughout the operation
Oil spillage	Contamination of land/nearby water bodies	Substation transformers located with insecure and impervious bundled areas with a storage capacity of at least 100% of the capacity of oil in transformers and associated reserve tanks.	Substation bounding("as-built" diagrams)	Bounding capacity and permeability	APDCL	Throughout the operation